NORTH BEACH WATER DISTRICT

PACIFIC COUNTY, WASHINGTON

WATER SYSTEM PLAN

May 2015

Washington State Department of Health Water System Identification Number 63000C

Gray & Osborne, Inc.

G&O Project No. 14222

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PACIFIC COUNTY **WASHINGTON**

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Gray & Osborne, Inc.
CONSULTING ENGINEERS

TABLE OF CONTENTS

CHAPTER 6 – OPERATION AND MAINTENANCE PROGRAM

CHAPTER 8 – IMPROVEMENT PROGRAM

LIST OF TABLES

LIST OF FIGURES

APPENDICES

LIST OF ABBREVIATIONS AND ACRONYMS

µg/L	Micrograms per Liter
AC	Asbestos Cement (pipe)
ac-ft	Acre-foot or Acre-feet
ac-ft/yr	Acre-Foot per Year or Acre-Feet per Year
ADD	Average Day Demand (per ERU)
AVB	Air Vacuum Breaker
AWWA	American Water Works Association
BAT	Backflow Assembly Tester
CAD	Computer Aided Drafting
CCC	Cross Connection Control
CCS	Cross Connection Control Specialist
CEU	Continuing Education Unit
CFR	Code of Federal Regulations Calculated Fixed Radius (a WHPA determination methodology)
cfs	Cubic Feet per Second
CIP	Capital Improvement Program
Comm	Community Water System
DBP	Disinfectant Byproduct
DCVA	Double Check Valve Assembly
DI	Ductile Iron Pipe
DOH	Washington State Department of Health
DOT	Washington State Department of Transportation
DSL	Distribution System Leakage
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
EPA	US Environmental Protection Agency
ERU	Equivalent Residential Unit
ft	Foot or Feet
GIS	Geographic Information System
GMA	Growth Management Act
gpcd	Gallons per Capita per Day
gpd	Gallons per Day
gpm	Gallons per Minute
HAA5	Haloacetic Acid 5, a group of regulated disinfection byproducts
HDPE	High Density Polyethylene Pipe
HOA	Homeowners Association
HP	Horsepower
ID	Identification
IDSE	Initial Distribution System Evaluation
IOC	Inorganic Chemical
kW	Kilowatts
LID	Local Improvement District
LRAA	Locational Running Annual Average
LUST	Leaking Underground Storage Tank
MCL	Maximum Contaminant Level

LIST OF ABBREVIATIONS AND ACRONYMS – (CONTINUED)

MDD	Maximum Day Demand (per ERU)
MFL	Million Fibers per Liter (referring to asbestos fibers)
MFL>10µm	Million Fibers per Liter greater than 10 microns in length
MG	Million Gallons
mg/L	Milligrams per Liter
MGD	Million Gallons per Day
MHI	Median Household Income
MSL	Feet Above Mean Sea Level (Elevation)
MWL	Municipal Water Law
N/A or NA	Not Applicable, Not Available, or Not Analyzed
No.	Number
NTNC	Non-Transient Non-Community water system
O&M	Operation and Maintenance
OFM	Washington State Office of Financial Management
PE	Polyethylene Pipe
PHD	Peak Hour Demand
PLC	Programmable Logic Controller
PM	Preventive Maintenance
ppb	Parts per Billion
ppm	Parts per Million
PRV	Pressure Reducing Valve
psi	Pounds per Square Inch
PVC	Polyvinyl Chloride Plastic
RAD	Radionuclide
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RPBA	Reduced Pressure Principle Backflow Prevention Assembly
SEPA	Washington State Environmental Policy Act
SOC	Synthetic Organic Chemical
TDH	Total Dynamic Head
THM	Trihalomethane
TNC	Transient Non-Community Water system
TTHM	Total Trihalomethanes
UGA	Urban Growth Area
USEPA	US Environmental Protection Agency
UST	Underground Storage Tank
VFD	Variable Frequency Drive
VOC	Volatile Organic Chemical
WAC	Washington Administrative Code
WD	Water District
WDM	Water Distribution Manager
WETRC	Washington Environmental Training Resource Center
WFI	Water Facilities Inventory Report
WHPA	Wellhead Protection Area
WMR	Water Main Replacement (program)

LIST OF ABBREVIATIONS AND ACRONYMS – (CONTINUED)

WSP	Water System Plan
WTPO	Water Treatment Plant Operator
WUE	Water Use Efficiency
ZOC	Zone of Contribution (to a WHPA)

CHAPTER 1

WATER SYSTEM DESCRIPTION

OBJECTIVE

SCOPE OF WORK

This Water System Plan (Plan) has been prepared for North Beach Water District (NBWD), and is an update of previous Plans prepared for and adopted by the previous water system owners, North Beach Public Development Authority (NBPDA), Ocean Park Water Company (OPWC), and Pacific Water Company (PWC), and 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

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

MANAGEMENT STRUCTURE AND DECISION-MAKING PROCEDURES

In addition to the three elected NBWD commissioners, NBWD 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 all other NBWD staff. The General Manager is responsible for day to day operations of the water system, and reports directly to the Commissioners. All other staff 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	Dennis Schweizer

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 Avenue, Suite 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 Wellfield (NWF) in the SW 1/4 of the NE 1/4 of Section 28. Three additional wells are located in the South Wellfield (SWF), two wells in the SE 1/4 of the NE 1/4 of Section 33, and one well in the NW 1/4 of the NE 1/4 of Section 33, all in Township 12 North, Range 11 West. One well in the SWF 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

NBWD 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 2 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.

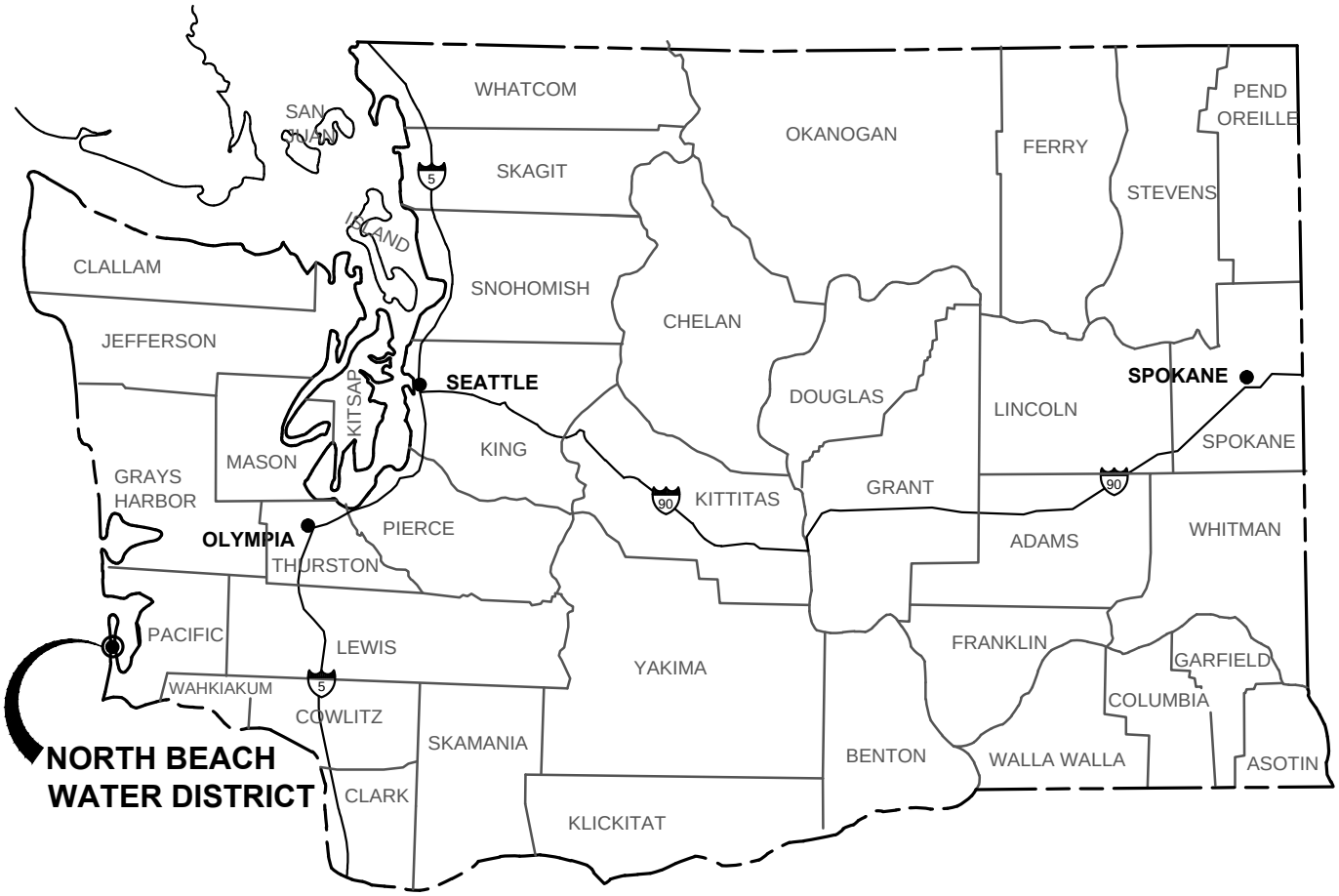
History

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



VICINITY MAP

NOT TO SCALE

NORTH BEACH WATER DISTRICT

WATER SYSTEM PLAN

FIGURE 1-1

VICINITY MAP

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water system plan for North Beach PDA was completed in 2008. Later in 2008, the NBWD was formed, ownership of the North Beach Water system was transferred to NBWD, and the NBPDA was disbanded.

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 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 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. 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 report is a comprehensive groundwater 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

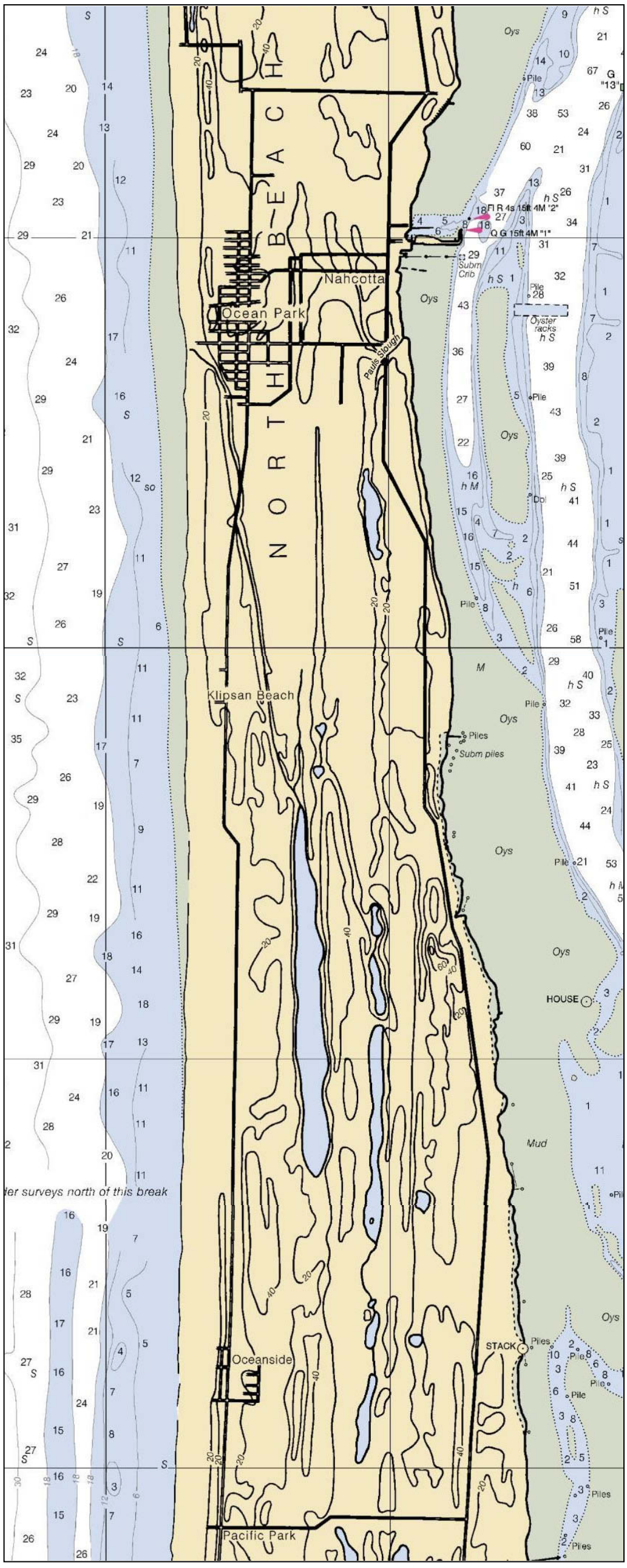
This water system is located north of NBWD, and serves a development known as Espy Ridge Tracts. Information regarding this system was obtained from the WFI form for this system, updated June 14, 2013. The WFI indicates that the Oysterville water system is owned by Oysterville Water NP Corp., a homeowner's 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

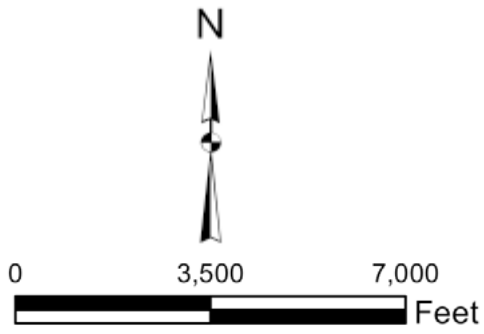
This water system is located north of NBWD, and serves the Surfside Estates subdivision as well as several smaller neighboring developments. Information regarding this system was obtained from the WFI form for this system, updated November 6, 2013. The Surfside water system is owned by Surfside Homeowners 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 six 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 gpm 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,



Map from Washington State Coastal Atlas, https://fortress.wa.gov/ecy/coastalatlas/tools/Map.aspx



NORTH BEACH WATER DISTRICT

FIGURE 1-2
TOPOGRAPHIC MAP

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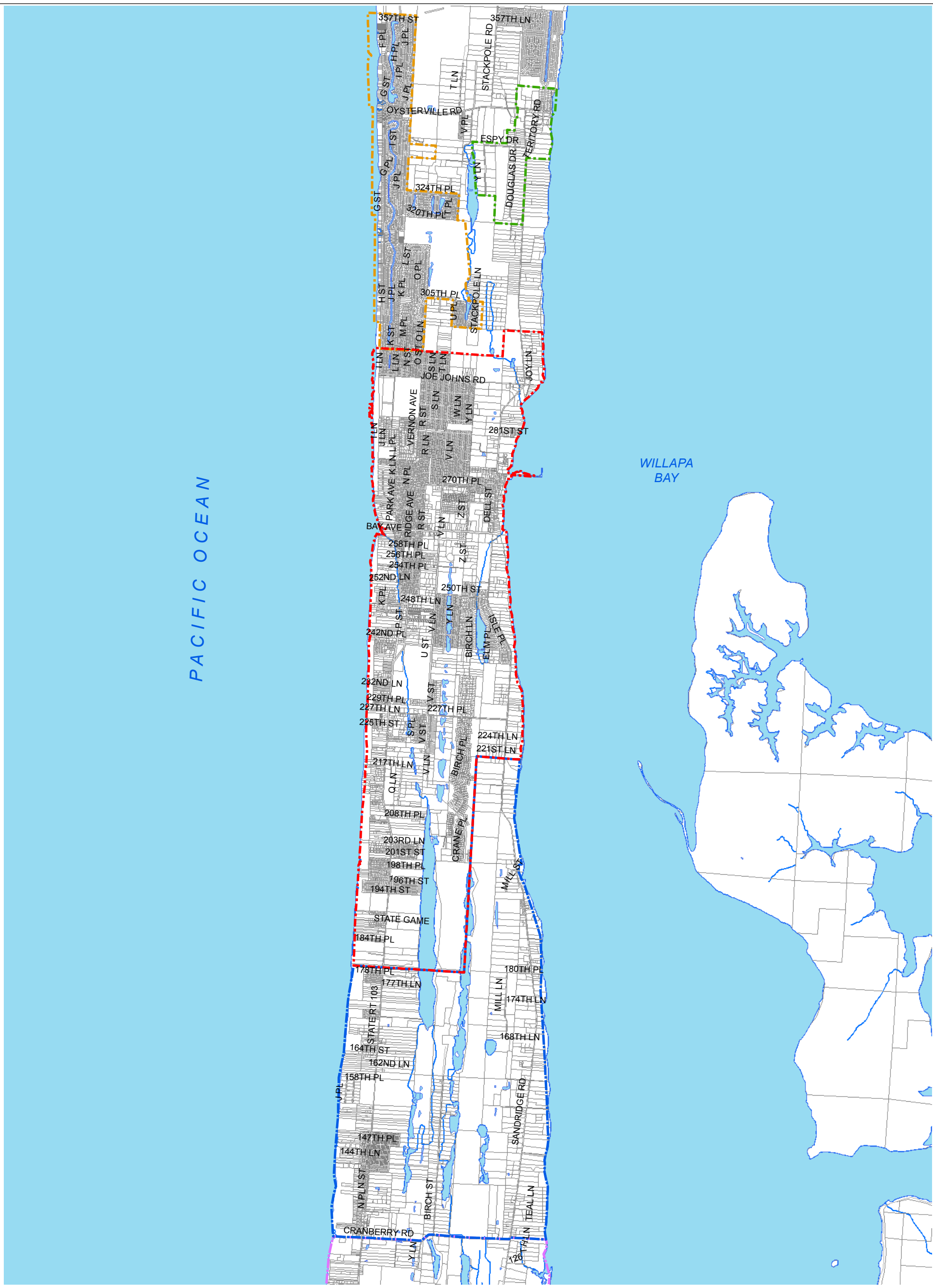

Legend

- NORTH BEACH WATER DISTRICT
- NORTH BEACH FUTURE WATER SERVICE AREA
- SURFSIDE WATER SERVICE AREA
- OYSTERVILLE WATER SERVICE AREA
- LONG BEACH FUTURE WATER SERVICE AREA

N

0 4,500 9,000 Feet

NORTH BEACH WATER DISTRICT

FIGURE 1-3
NEARBY WATER SYSTEMS

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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 and 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 and 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] A summary of NBWD water rights is included in Table 1-2. Copies of water rights certificates are included in Appendix B.

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	N 1/2 NE 1/4 Section 33	12/15/1969	500	168	
G2-00759C	N-1, N-2, N-7, N-8	SW 1/2 NE 1/4 Section 28	7/14/1965	200	320	
G2-21399C	N-3, N-6	SW 1/2 NE 1/4 Section 28	8/23/1973	100	128(6)	32(6)
G2-25737C	N-4	SW 1/2 NE 1/4 Section 28	10/22/1980	130	(7)	140
G2-27073C	N-5	SW 1/2 NE 1/4 Section 28	3/16/1987	105		252
G2-29907P	N-3, N-4, N-5, N-6, N-7, N-8	SW 1/2 NE 1/4 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) 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. Reissued 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) Certificate G2-25737C does not 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." Rights G2-00759 and G2-21399 already limited total withdrawals to 448 ac-ft/yr, so the effect is that all rights in G2-25737 are non-additive.

[1] Ac-ft/yr is acre-feet per year. One acre-foot is the amount of water required to cover one acre of area 1-foot deep. This volume is 43,560 cubic feet. At 7.48052 gallons per cubic foot, 1 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.

(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 NWF 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 SWF plus 528 ac-ft/yr for the additive rights of the NWF, for a total of 696 ac-ft/yr.

INVENTORY OF EXISTING FACILITIES

SOURCE FACILITIES

NBWD has a total of eleven water wells, five of which is listed as emergency use only and one is listed as inactive. The wells are located at two sites, 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.) In addition, NBWD has drilled three new wells near the SWF designated as the Wiegardt Wells 1, 2 and 3. NBWD intends to put these new wells in service and decommission Wells S-1, S-2 and S-4. Well N-5, N-6 and N-8 are shown in Figure 1-4. Copies of all available well construction reports for the NBWD wells are included Appendix C. Pertinent information about the wells is summarized in Table 1-3.

FIGURE 1-4

North Wellfield

TABLE 1-3

Existing Water Sources

Source Name	DOH Source ID No.	Year Drilled	Casing Diameter, inches	Depth, feet	Screened Interval	Applicable Water Rights	Status[1]	Installed Pumping Capacity (gpm)[2]
N-1	S-01	Unknown	8[3]	80[3]	59-79[3]	G2-00759C	E	100
N-2	S-02	Unknown	6	122	105-120[4]	G2-00759C	E	100
N-3	S-03	Unknown	8	124	114-124	G2-21399C, G2-29907P	E	90
N-4	S-04	1981	8	120	100-120	G2-25737C, G2-29907P	A	135
N-5	S-05	1986	8	124	104-124 [5]	G2-27073C, G2-29907P	A	135
N-6	S-07	1996	8	130	107-127	G2-21399C, G2-29907P	A	110
N-7	S-08	Unknown	6	120	100-120	G2-00759C, G2-29907P	A	65
N-8	S-09	1996	8	130	106-126	G2-00759C, G2-29907P	A	90
S-1	S-10	1964	8	56	41-56	G2-00174C	E	30
S-2	S-11	1964	8	100	85-100	G2-00174C	E	60
S-4	S-12	1996	8	121	101-121	G2-00174C	E	80
SW-1[6]	[7]	2013	8	149	118-138	G2-00174C	NA	150[8]
SW-2[6]	[7]	2014	8	149	120-141	G2-00174C	NA	150[8]
SW-3[6]	[7]	2014	8	150	121-142	G2-00174C	NA	150[8]
Total Installed Source Pumping Capacity[9]								**915**
Total Active Installed Source Pumping Capacity[9]								**535**
Total Installed Source Pumping Capacity with Largest Source out of Service[9]								**400**

(1) Status indicators are: E – Emergency Use Only; A – Active; NA – Not Yet Activated.

(2) Installed 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.

(3) 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.

(4) 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.

(5) Well log indicates no screen is installed. However, well 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.

(6) Wiegardt Wells 1, 2 and 3 are designated wells SW-1, SW-2 and SW-3.

(7) The Wiegardt Wells have been drilled and tested but have not yet been approved yet by DOH and therefore have no source numbers assigned.

(8) The Wiegardt wells each pump tested at 150 gpm. Actual installed capacity is not yet established.

(9) The Wiegardt wells are not counted in system source 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 in Table 1-3, 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 in Table 1-3, Well S-2 is now reported as having only 60 gpm capacity. NBWD has drilled and tested three new wells, the Wiegardt Wells, in the SWF area and plans to put them into service in the 2015.

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 were designed to 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.

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.

Ozone has historically been 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 was injected into the water and the water subsequently flowed 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 NWF as well as 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 results of the pilot test, NBWD has discontinued using ozone as an oxidant at the NWF Treatment Plant.

FIGURE 1-5

North Wellfield 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 are shown in Figures 1-6 and 1-7.

FIGURE 1-6

North Reservoirs

FIGURE 1-7

South Reservoir

BOOSTER STATIONS

The storage reservoirs 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. All pumps at the NWF are switched with across-the-line starters. The control system is currently not operating satisfactorily, so booster pumps are turned on and off manually. Pump station discharge pressure is maintained at 60 psi by a 6-inch pressure reducing valve on the pump station discharge header. A pressure relief valve recycles water from the pump discharge manifold to the pump suction manifold when pressure in the discharge manifold exceeds 90 psi.

The SWF booster pump system consists of four electric motor driven booster pumps: two 10-hp pumps and two 40-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 60 psi. The two 40-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[1]	Stop Criteria[1]	Capacity, gpm
North Wellfield Booster Pumps						
N-1	Peerless PE-503	5	DOL[2]	≤60 psi	≥70 psi	109
N-2	Peerless PE-833	7.5	DOL	≤58 psi	≥75 psi	120
N-3	Peerless C-820A	15	DOL	≥205 gpm	<205 gpm	280
N-4	Peerless C-825A	25	DOL	≥500 gpm	<500 gpm	500
N-5	Peerless C-825A	25	DOL	≥1,000 gpm	<1,000 gpm	500
N-6	Peerless PE-833	7.5	DOL	≤60 psi	≥75 psi	120
N-7	Peerless PE-833	7.5	DOL	≤58 psi	≥73 psi	120
N-8	Peerless PE-833	7.5	DOL	≤56 psi	≥71 psi	120
Subtotal, NWF						1,869
South Wellfield Booster Pumps						
S-1	PACO 10-12709ES	10	VFD[3]	≤60 psi	≥70 psi	175
S-2	PACO 10-12709ES	10	VFD	≥175 gpm	<175 gpm	175
S-3	PACO 10-30707ES	40	Soft[4]	≥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						3,719
Total capacity with largest pump out of service						2,969

(1) Pump start and stop criteria are for the automatic pump control system that is currently not functioning satisfactorily. Pumps are currently turned on and off manually. Discharge from the NWF booster pump station is through a six-inch pressure reducing valve set to a discharge pressure of 60 psi.

(2) DOL is Direct On Line motor starters, also called Across The Line motor starters. DOL motor starters start motors by direct connection to full line voltage.

(3) VFD is Variable Frequency Drive. VFD motor controllers control motor speed by varying the frequency of the alternating current fed to the motors.

(4) Soft starters use solid state electronic control systems to start motors on reduced voltage, then gradually increase the voltage as the motor speed increases.

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

FIGURE 1-8

North Wellfield Booster Pump Station

FIGURE 1-9

South Wellfield Booster Pump Station

BACKUP POWER SUPPLY

Four emergency standby generators are provided to keep the water system operating 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 it 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.

FIGURE 1-10

South Wellfield 150 KW Generator

TRANSMISSION AND DISTRIBUTION SYSTEM

Description

Transmission and distributions facilities consist of over 56 miles of pipes ranging in size from 2 inches to 12 inches in diameter. Piping installed prior to 1980 was a combination 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. A water system base map showing distribution system facilities is shown in Figure 1-11.

Pipe Inventory

Based on system mapping, the water distribution system consists of slightly more than 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 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 conveying enough water to make the intertie feasible. Currently, there is a separation of approximately 1.2 miles by road between adequately sized water mains in NBWD and Surfside HOA water system, 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 of these lengths make interties impractical 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 that 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 PWC was approved on July 23, 1981, and the last water system plan prepared for PWC was completed in August 1994.

500′ 250′ 0 500′ 1000′
SCALE: 1″=500′

NORTH BEACH WATER: NORTH WELL FIELD, RESERVOIR, BOOSTER STATION, AND TREATMENT PLANT

NORTH BEACH WATER: SOUTH WELL FIELD, RESERVOIR, BOOSTER STATION, AND TREATMENT PLANT

WIEGARDT WELLS 1–3

Port of Peninsula Office

CANNERY

COAST OYSTER

Morehead Road

Sandridge Road

Bay Ave

Ocean Approach

Broadway

Riggs

Randolph

Eleanor Ave

Vista Bay Tracts

Township 12 Range 11W

Township 11 Range 11W

PACIFIC OCEAN

Western Boundary Upland Ownership

Estimated Mean High Water Tide

GOVT. MEANDER LINE

SR-103

LOT- 1

LOT- 2

Loomis Lake

Lost Lake

Legend

- 2"
- 3"
- 4"
- 6"
- 8"
- 12"
- SWAMP

NORTH BEACH WATER DISTRICT

FIGURE 1–11
EXISTING DISTRIBUTION SYSTEM

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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 PSSWSP 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 water system plans, including Surfside HOA to the north and City of Long Beach to the south.

WATERSHED PLANNING – WRIA 24, WILLAPA

Watershed Planning is not being pursued under the Watershed Planning Act in the Willapa watershed basin, WRIA 24. There are no current 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 declined 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. NBWD serves a large number of seasonally occupied homes and tourism related businesses.

EXISTING SERVICE AREA

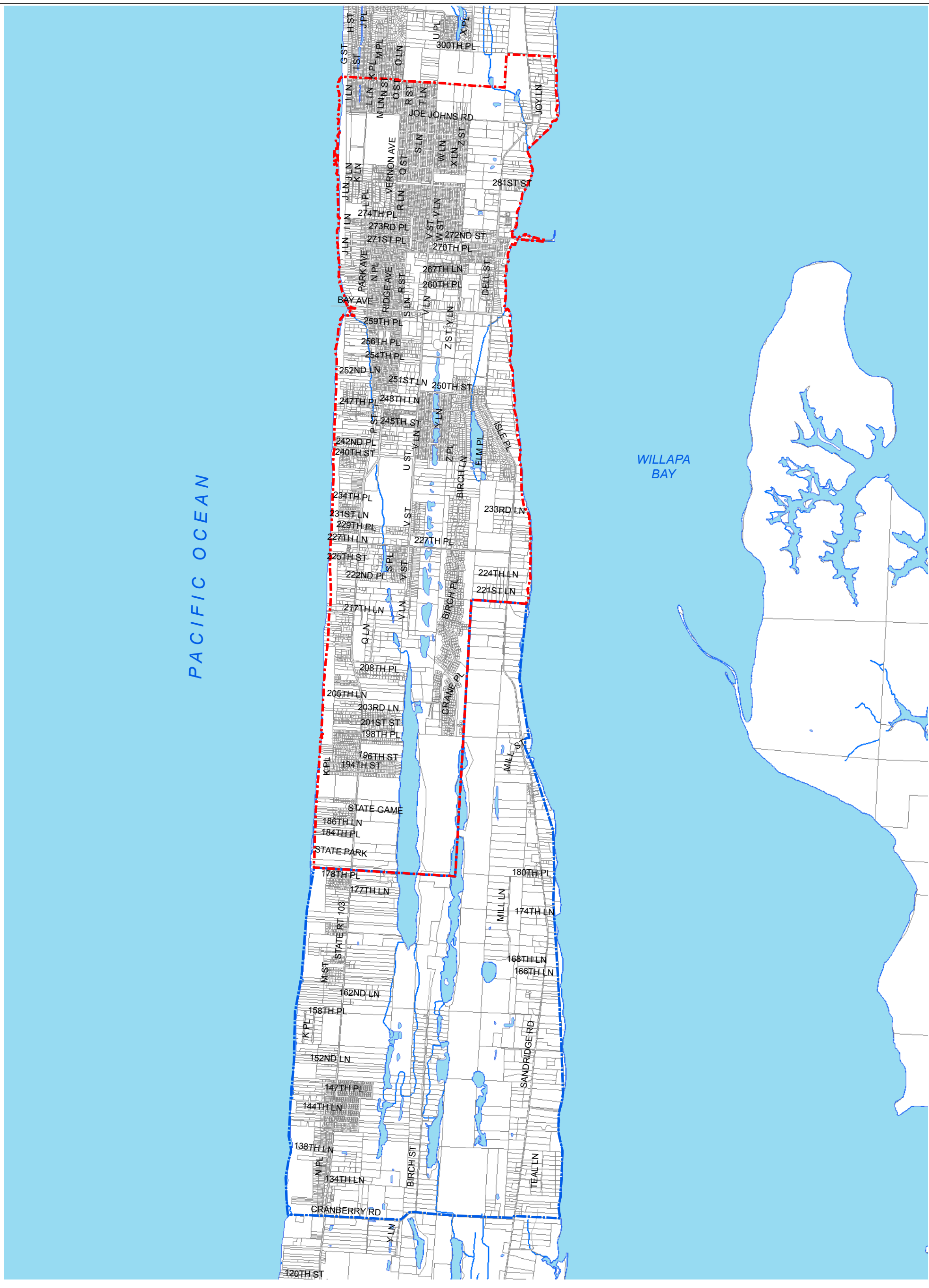
WAC 246-290-010 defines "Existing Service Area" as "a specific area within which direct service or retail service connections to customers of a public water system are currently available." For water service to be currently available to a parcel, the parcel must be already served, or a water main must 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 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 the same as the existing service area, and the future retail water service area is the same as the future service area.



Legend

NORTH BEACH WATER DISTRICT EXISTING RETAIL SERVICE AREA

NORTH BEACH WATER DISTRICT FUTURE RETAIL SERVICE AREA

N

0 3,500 7,000

Feet

NORTH BEACH WATER DISTRICT

FIGURE 1-12
SERVICE AREA MAP

Gray & Osborne, Inc.

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 PCCWSP, there is no binding mandate to honor service area boundaries. It has, nevertheless, been the practice of purveyors on the North Beach Peninsula to honor the service areas designated by the PCCWSP, and there are no known territorial disputes regarding service areas.

PACIFIC COUNTY COORDINATED WATER SYSTEM PLAN

The establishment of service area boundaries by the PCCWSP 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 PCCWSP 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 North Beach Peninsula have been operating in the spirit of the 1985 PCCWSP, although, since the PCCWSP was never adopted by the County, it has no legal standing.

NBWD RULES AND REGULATIONS

The NBWD Rules and Regulations 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 Regulations is included in Appendix D of this Plan. Following is a summary of how the NBWD Rules and Regulations address the policy list from the Planning Handbook.

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:

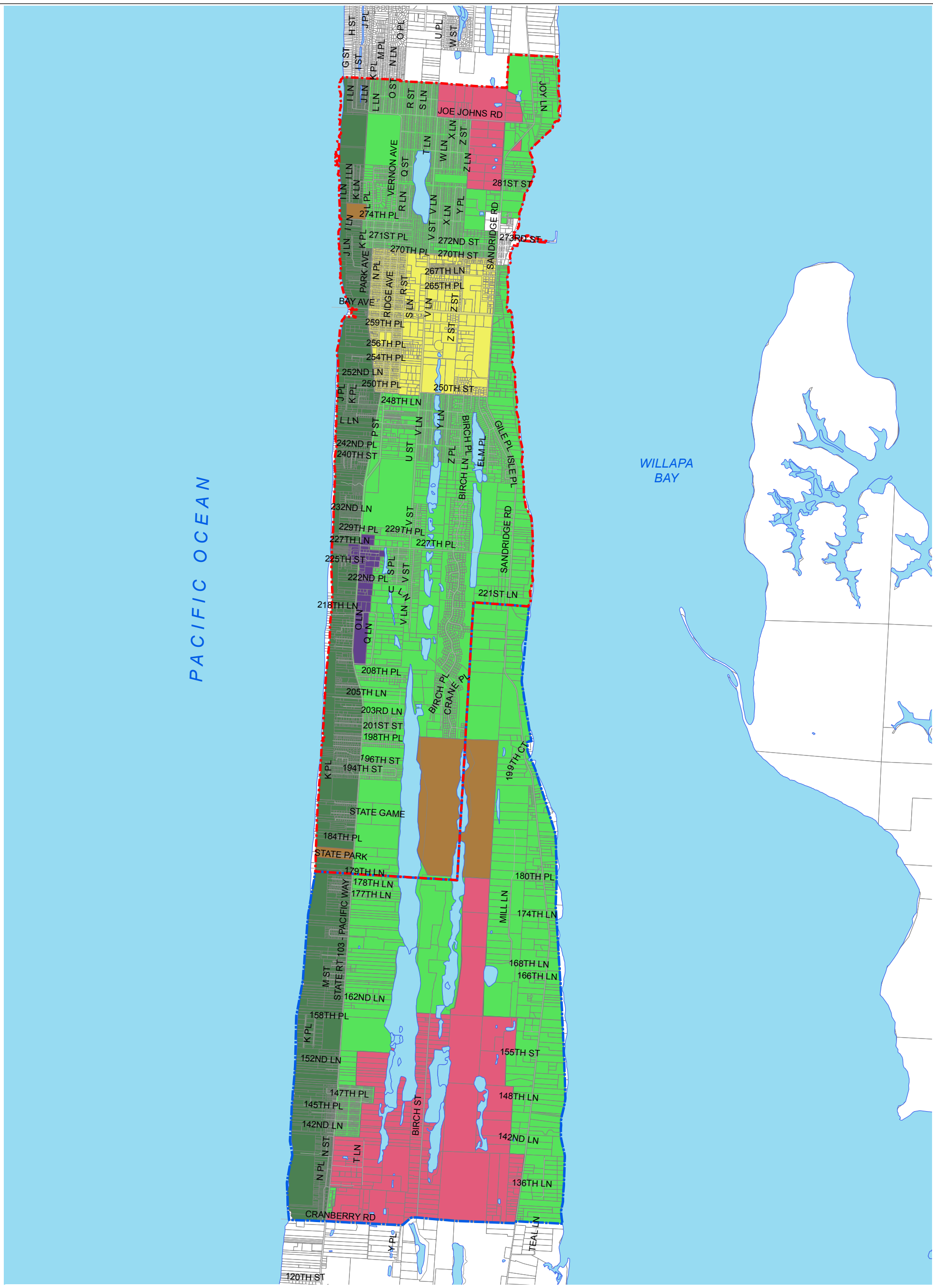
- Wholesaling Water
- Wheeling Water
- Annexation
- Direct Connection and Satellite/Remote Systems
- Design Performance Standards
- Surcharge for Outside Customers
- Formation of Local Improvement Districts Outside Legal Boundaries
- UGA
- Late-Comer Agreements
- Oversizing
- Cross-Connection Control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

The PCCWSP, while never formally adopted, has been used as a guide for service area 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 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."



Legend

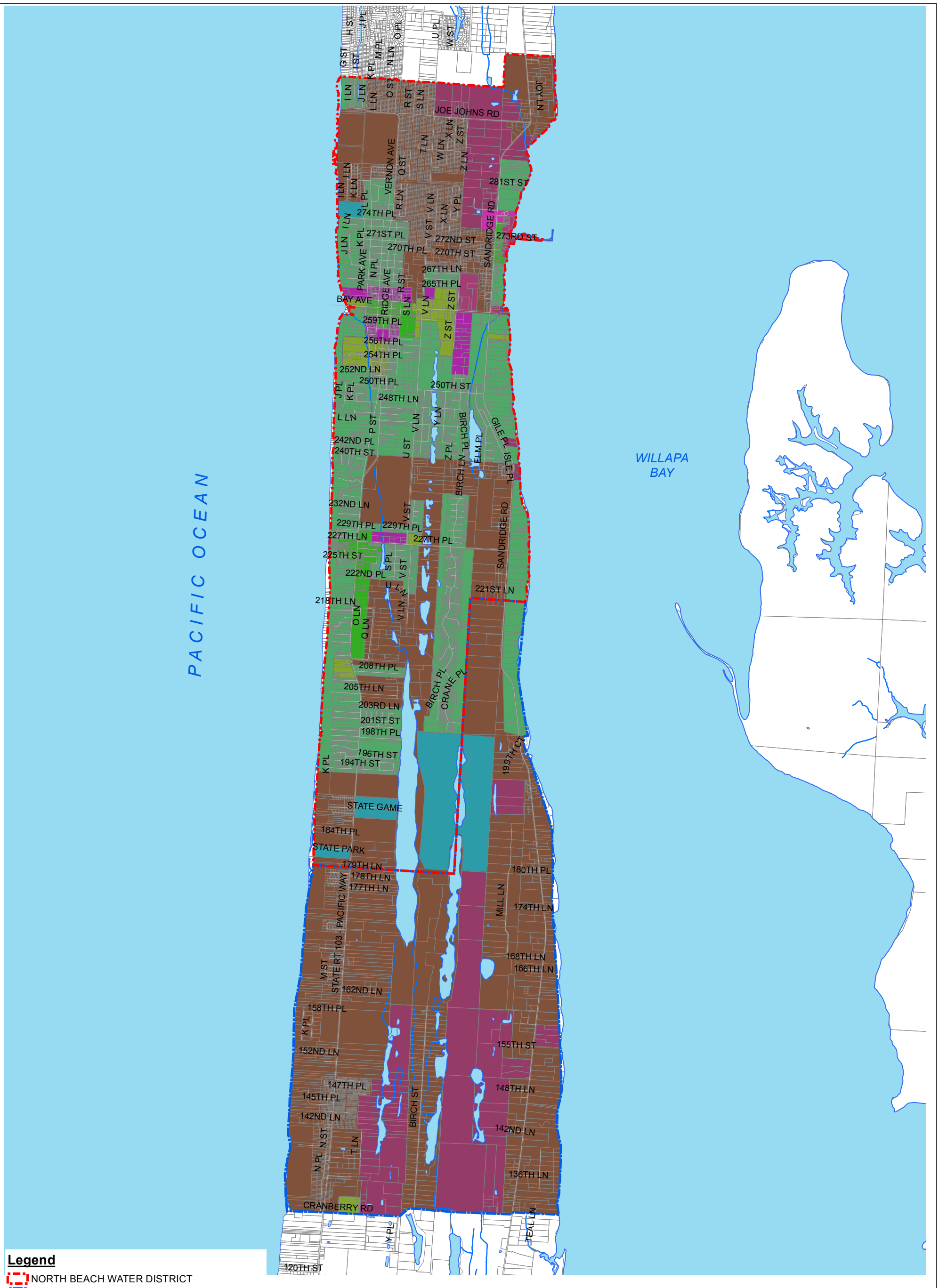
EXISTING LAND USE:

- COMMUNITY CROSSROAD - KLIPSAN CROSSING
- GENERAL RURAL
- PUBLIC RESERVE
- RURAL ACTIVITY CENTER - NAHCOTTA
- RURAL AGRICULTURAL
- RURAL VILLAGE - OCEAN PARK
- SHORELINE DEVELOPMENT
- NORTH BEACH WATER DISTRICT
- NORTH BEACH FUTURE WATER SERVICE AREA

NORTH BEACH WATER DISTRICT

FIGURE 1-13
EXISTING LAND USE MAP

Gray & Osborne, Inc.



Legend

- NORTH BEACH WATER DISTRICT
- NORTH BEACH FUTURE WATER SERVICE AREA

ZONING:

- AGRICULTURAL (AG)
- COMMUNITY COMMERCIAL (CC)
- CONSERVATION (CD)
- COMMERCIAL FOREST (FC)
- INDUSTRIAL (IND)
- MIXED USE (MU)
- RESTRICTED RESIDENTIAL (R1)
- GENERAL RESIDENTIAL (R2)
- RESORT (R3)
- RURAL RESIDENTIAL (RR)

N

0 2,500 5,000 Feet

NORTH BEACH WATER DISTRICT

FIGURE 1-14
ZONING MAP

Gray & Osborne, Inc.

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 NBWD to receive direct water service from NBWD.

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 E. 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 customers.

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, NBWD does not provide water service outside their corporate boundaries. If circumstances change in the future, any area outside the current NBWD corporate boundary would have to annex into NBWD 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 NBWD boundaries. Requests in the future for service and ULID formation outside NBWD boundaries will need to be reviewed on a case by case basis.

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 Rule states, in part, that water main extensions shall be constructed by NBWD or in accordance with the Rules and Regulations of NBWD and subject to approval of the General Manager. A party wishing water service where there is no existing water main may request NBWD to extend the water main, or may install the water main using a private contractor, subject to NBWD approval. In either case, service will be provided after the main has been installed, tested, and accepted by NBWD, and the party requesting service has paid all applicable fees and reimbursed NBWD for its costs.

NBWD 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 NBWD 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, NBWD 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 NBWD agreeing to pay their pro rata share and apply for a water connection as soon as the water main is accepted by NBWD. NBWD 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 include responsibilities that customers have to NBWD. Some of these responsibilities are summarized as follows:

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 NBWD Regulations 1.01.190 and 1.01-350, respectively. Connection fees are summarized in Table 1-6.

TABLE 1-6

Connection Fee Schedule

Connection Fee	3/4-Inch Meter	1-Inch Meter	1-1/2-Inch Meter	2-Inch Meter	3-Inch Meter	4-Inch Meter
Meter Installation Fee	$650	$1,050	$1,975	$3,750	(1)	(1)
General Facilities Charge	$1,243	$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 NBWD 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 by email to the NBWD Office. Complaints are forwarded to the NBWD General 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 NBWD General Manager. The NBWD General Manager is responsible for recording the resolution of the complaint in the complaint log. Complaints unresolved by the Field Supervisor or the General 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.

CHAPTER 2

BASIC PLANNING DATA

OBJECTIVE

The objective of this chapter is to present basic planning data and water demand forecasts needed to assess the current and future capabilities of the water system to provide service. This chapter provides existing and projected population, service connections, and water use data, and develops the water demand associated with the planning element known as an Equivalent Residential Unit (ERU). The chapter also includes projected land use and water demands for 6- and 20-year planning periods.

The water use data and water demand forecasts found in this chapter comprise two of the three elements required for the development of a water use efficiency (conservation) program. The third required element is implementation of the water use efficiency (conservation) program and its component parts, which is addressed in Chapter 4.

HISTORIC SYSTEM DEMANDS

In this section historic system demands are examined in terms of production per capita and per connection for the North Beach Water District. This information is later used to project future water system demands and evaluate water use efficiency.

WATER PRODUCTION

Monthly Production by Source

As shown in Table 1-3 NBWD has eleven water sources, one of which (DOH Source S-12, NBWD Well No. S-4) is currently inactive. Production rates for these wells range from 30 gpm to 135 gpm, with a total installed production capacity of 915 gpm. Metered water production data has been obtained and evaluated for the period from April 2008 through December 2013. Monthly production by source is summarized in Figure 2-1.

From the chart it can be seen that the distribution of water production has shifted over the years. For example Well N-6 was a significant contributor to total source capacity between April 2008 and March 2009, but contributed relatively little between April 2009 and January 2011, then became a significant contributor to overall production from February 2011 through December 2013. Well S-1 was a significant contributor prior to January 2011, but has contributed little or nothing since that time. Wells N-1, N-2 and N-3 were regular and sometimes significant contributors to overall production prior to September 2011, but have contributed little or nothing since then. These variations in production distribution reflect both changing well conditions and operator preferences. It

should be noted, however, that total production shows a distinct downward trend, both in average production and in maximum month production.

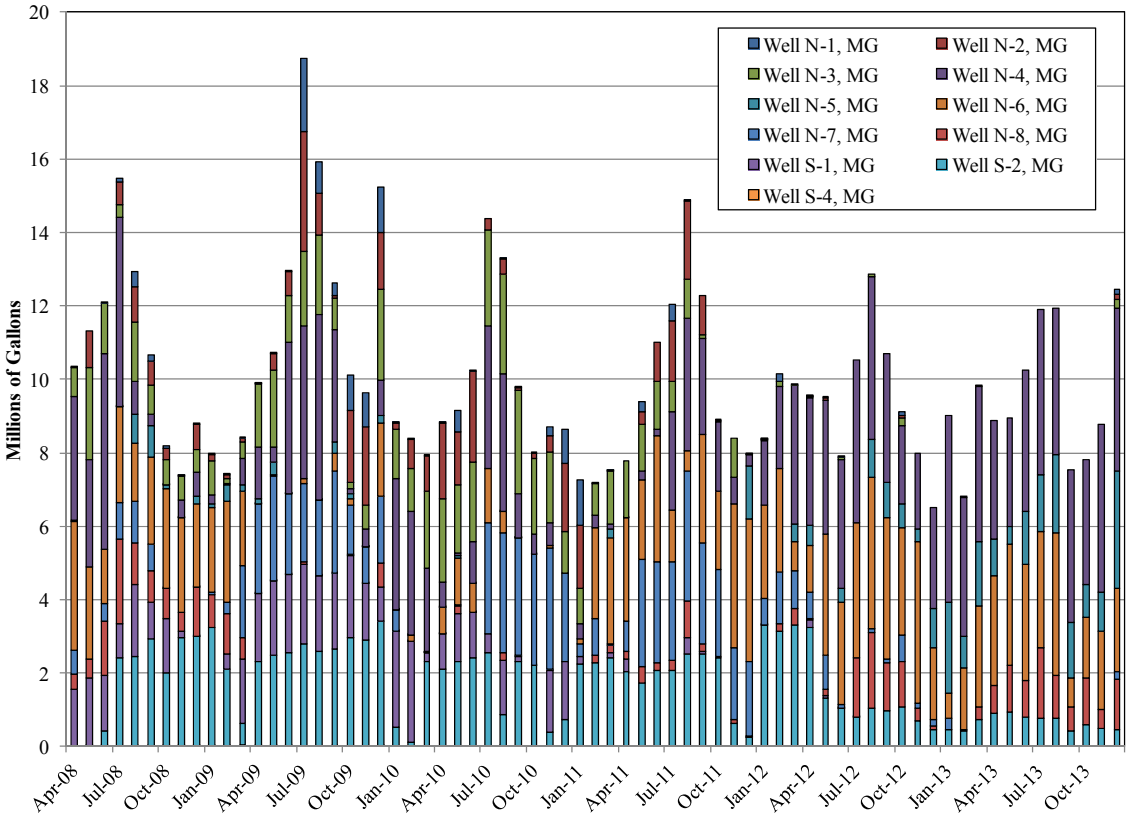


FIGURE 2-1

Monthly Water Production by Source

Total Annual Production

Total annual production for each well and for all wells is summarized in Table 2-1. Maximum annual production for the data period was 2009, as is also visually evident from Figure 2-1. Annual production generally declined after that.

TABLE 2-1

Annual Water Production Records, MG [1]

Well	2008[2]	2009	2010	2011	2012	2013
N-1	0.78	6.34	1.82	1.98	0.30	0.15
N-2	4.50	11.57	11.09	8.06	0.15	0.15
N-3	10.87	14.93	24.21	10.42	0.59	0.23
N-4	20.13	20.80	21.03	13.15	37.60	48.21
N-5	2.73	1.91	0.10	1.70	5.49	18.31
N-6	28.71	9.87	5.12	28.74	34.48	28.44
N-7	6.34	20.90	18.87	23.16	6.13	0.48
N-8	11.86	3.33	0.48	2.91	7.64	10.36
S-1	12.65	19.24	14.52	1.25	0.28	0.00
S-2	22.14	30.59	18.89	23.20	20.36	7.80
S-4	0.08	0.07	0.00	0.00	0.00	0.00
Totals	120.81	139.55	116.13	114.57	113.02	114.13

(1) MG is million gallons produced for the indicated year.
(2) Production data for 2008 is based on data from April 1, 2008 through March 31, 2009, because data for January through March 2008 is not available.

Filter Backwash and Net Production

As described in Chapter 1, both well fields have filtration systems that require regular backwashing. Backwash water is discharged to ground, so total well production minus backwash water is the net production available to the water distribution system. Total monthly water production, monthly backwash, and net monthly production are shown in Figure 2-2.

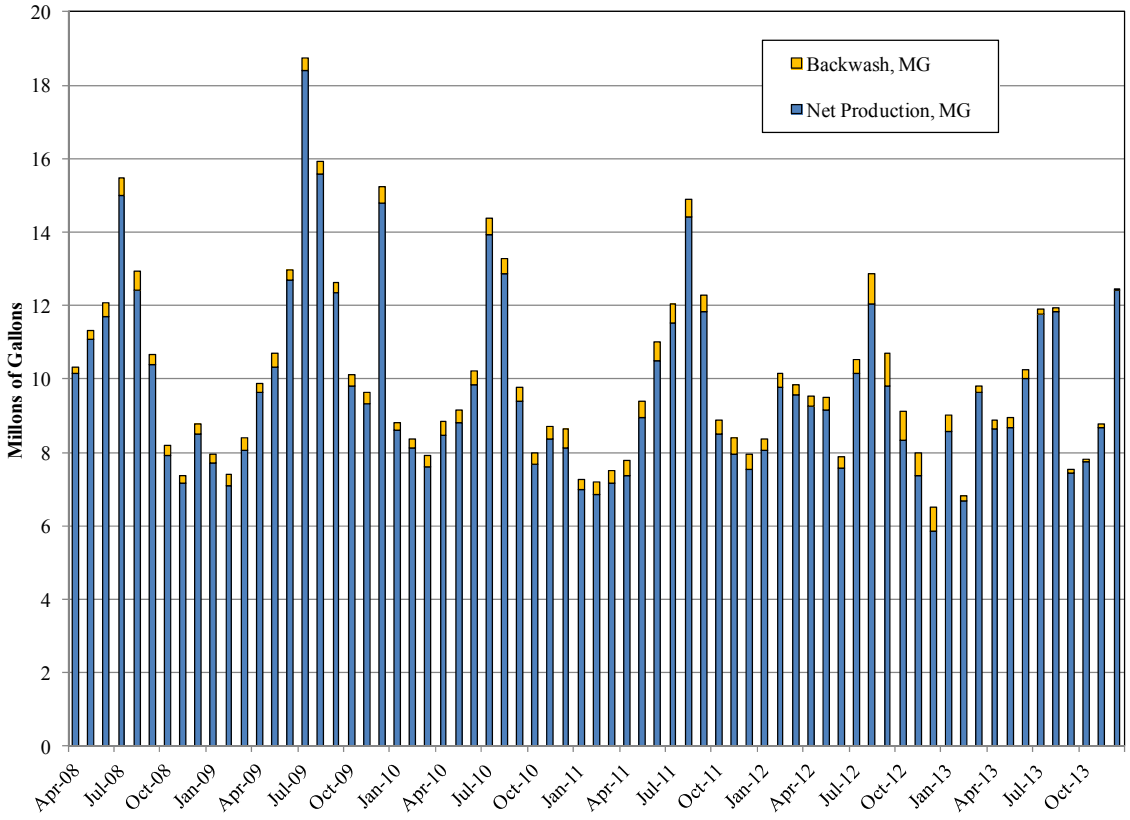


FIGURE 2-2

Total Monthly Production, Backwash and Net Production

Annual water production, annual backwash and net annual production are summarized in Table 2-2. Backwash ranges from 1.6 percent to 4.3 percent of total water production, with an overall average of 3.1 percent.

TABLE 2-2

Total Annual Production, Backwash and Net Annual Production

Parameter	2008	2009	2010	2011	2012	2013
Total Annual Production, MG	120.81	139.55	116.13	114.57	113.02	114.13
Total Annual Backwash, MG	3.60	3.78	4.41	5.00	3.61	2.16
Net Annual Production, MG	**117.21**	**135.78**	**111.73**	**109.57**	**109.41**	**111.97**
Percent Backwash	3.0%	2.7%	3.8%	4.4%	3.2%	1.9%

Maximum Day Net Production

Daily net production values (total production minus backwash) for 2008 through 2012 were reviewed, and the first, second and third maximum days and the average day values were determined for each year. (2013 was not used because daily meter reads are not available for 2013) Table 2-3 summarizes these values in gallons per day (gpd).

TABLE 2-3

Maximum Day to Average Day Ratio

Year	First Maximum, gpd	Second Maximum, gpd	Third Maximum, gpd	Average, gpd	Maximum to Average Ratio
2008	818,959	719,526	708,060	321,136	2.55
2009	1,013,566	874,517	865,540	371,994	2.72
2010	665,015	659,387	632,984	306,096	2.17
2011	666,456	661,188	656,133	300,202	2.22
2012	763,075	594,448	574,149	298,948	2.55
Average					2.44

The highest single day of net water production over the data period was December 15, 2009, creating a maximum day to average day ratio of 2.72. The second and third highest production days over the data period were also in December 2009. If we take the second highest day in 2009 we get a second-maximum day to average day ratio of 2.35. From Figures 2-1 and 2-2 it can be seen that December 2009 was an unusually high water production month, particularly for the time of year. This occurred due to an unusual freeze in December 2009 which caused numerous water pipe breaks. The subsequent thaw resulted in catastrophic water loss to many customers. The District declared an emergency and, without notice, turned off water to meters running unchecked to keep from running out of water. A similar incident happened in February 2012 but the District was better prepared for the event.

The second highest maximum day to average day ratio is 2.55 in 2008. The maximum day of 818,959 gpd occurred on September 22, 2008. The day prior to this and the day after this were relatively low production days at 118,520 and 187,178 gallons, respectively. The second- and third-highest days in 2008 were July 20 and August 31, which are more typically representative times for maximum days. These days represent maximum day to average day ratios of 2.24 and 2.20, respectively. The maximum day of 763,075 gallons in 2012 was on February 10, the day referred to above regarding freezing. If we take the second highest day in 2012 we get a second-maximum day to average day ratio of 1.99.

Based on the above, it is apparent that the most extreme maximum days represent emergency situations or unusual circumstances that may not be reasonable design points.

Therefore, some kind of averaging of maximum day demand may be appropriate. If we take second maximum days for each year we get a range from 1.99 to 2.35. If we take the average of the top three maximum days to the annual averages, we get a range of values from 2.12 to 2.47. If we average the annual maximum day to average day ratios we get an average maximum day to average day ratio of 2.44. **For the purposes of this plan, a maximum day to average peaking factor of 2.44 will be used to estimate maximum day demands.**

CONNECTIONS HISTORY

The Water Facilities Inventory (WFI) dated 11/08/2007 reported 2,444 full time and part time occupied single family residential connections, no multi-family connections, 131 recreational connections, and 69 commercial connections, for a total of 2,644 connections. The current WFI updated 5/5/2014 reports 1,510 full time and 1,090 part time occupied single family residential connections, 519 full and part-time residential units in 14 multi-family units, no recreational connections and 75 commercial connections, for a total of 3,194 connections. Billing data from January 2010 through December 2013 has residential connections varying from a high of 2,584 to a low of 2,540, and commercial connections varying from a high of 106 to a low of 101, for a total varying from a high of 2,690 to a low of 2,643 total connections. The 2010 through 2013 billing data is a difference of approximately 500 connections from the current WFI numbers because DOH counts connections differently than the District's billing software. The billing system does not count individual living units in multi-unit buildings because they are generally served by a single service meter and have a single billing account. Therefore, the current billing number of service connections is approximately the same as it was in 2007.

As indicated above, many of the residential connections are not full time occupied. That number changes continuously. However, there is no system for tracking full time and part time services. For the purpose of this analysis, any residential or commercial connection that has no water use for any given billing cycle will be considered an inactive connection for that billing cycle. For 2007 through 2009 we have only the numbers on the November 2007 WFI. Since January 2010 monthly water use data per connection data is available. Connections history since November 2007 is shown in Figure 2-3. Active and inactive residential and commercial connections are indicated by different shades of color. It can be seen that every month has a significant number of inactive service connections, and that the number of active connections increases in the summer and decreases in the winter. The specific connections that are inactive may change from month to month, and some connections may be active for only part of the month, but with only monthly water meter reads it is not possible to differentiate between residences that are occupied for only part of a month and those that just use very little water.

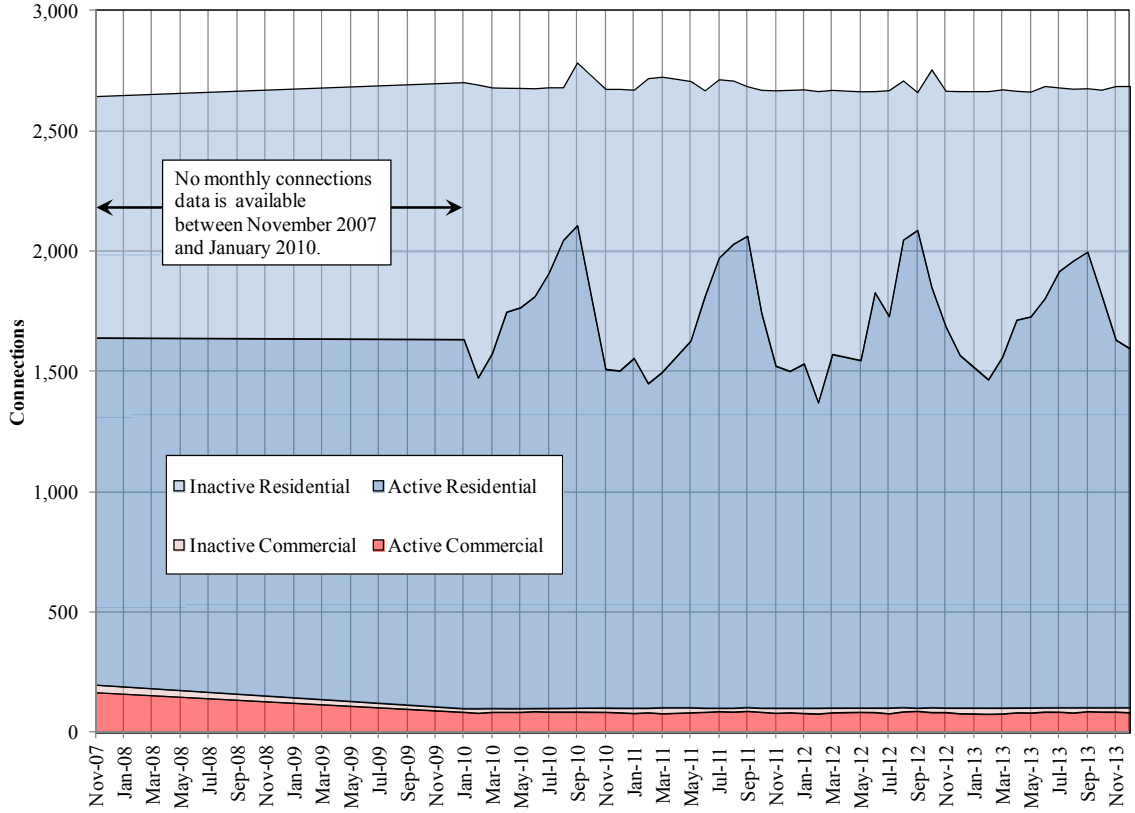


FIGURE 2-3

Historic Water Connections

It can be seen that the total number of connections has remained fairly constant from November 2007 through the present. The chart shows that the number of commercial connections decreased as the number of residential connections increased, but it is not clear that this a real change in commercial and residential connections. The billing system does not have a category for recreational connections, so the recreational connections reported in the 2007 WFI were assigned as commercial for the purpose of this analysis, although many of these may have actually been seasonal residential connections. The increase in total system connections from 2,644 in November 1997 to 2,686 in December 2013 represents an annual growth rate of 0.26 percent.

CONNECTIONS BY CUSTOMER CLASS

As discussed above, 131 recreational connections were identified in the 2007 WFI, while no recreational connections are identified in the 2013 WFI. It is probable that the nature of the connections did not change significantly, but rather the way that connections are counted. There was a change in system management between 2007 and 2013 that may account for this change. The NBWD billing system only identifies two customer classes:

Residential and Commercial. The recreational connections identified in the 2007 WFI most likely consisted of some residential and some commercial connections.

TABLE 2-4

Historic Year-End Water Services by Customer Class

End of Year[(1)]	Residential Connections	Recreational Connections[(2)]	Commercial Connections[(3)]	Total Connections
2007	2,444	131	69	2,644
2010	2,571	-	103	2,674
2011	2,567	-	103	2,670
2012	2,561	-	104	2,665
2013	2,581	-	105	2,686

(1) Year end connections data is not available for 2008 and 2009.

(2) The 2007 WFI form identified 131 recreational connections, while the 2013 WFI form does not identify any recreational connections. It is most likely that this only represents a change in the way that connections are counted. The NBWD billing system only identifies two categories of customer: Residential and Commercial.

(3) The 2007 WFI form identified 69 commercial connections, while the 2010-2013 billing records identify 103 to 105 commercial connections. The NBWD billing system does not have a billing category for recreational service. While it is not certain how connections were counted for the 2007 WFI form, it is probable that some commercial connections were counted as recreational and some residential connections were also counted as recreational. Note that the commercial connections include a school.

WATER SALES AND USE

Water sales and use data has been derived from water billing, fire flow and water main flushing records from January 2010 through December 2013. Monthly water sales and use data is shown in Figure 2-4.

Water main flushing records are unavailable prior to February 2010. It should also be noted that in July 2013, a significant volume of water (2.84 MG) went to "wholesale water use." Wholesale water use, in this case, is water used for filling tank trucks, generally for construction purposes. The large wholesale water usage in July 2013 was due to a major cell phone tower construction project for which NBWD supplied water. Small amounts also went to construction projects in July 2011 (0.004 MG) and October 2011 (0.009 MG). Small amounts of water were also used for fire flow in July 2010 and June and July 2012, but these amounts were small enough that they are barely discernible in the chart.

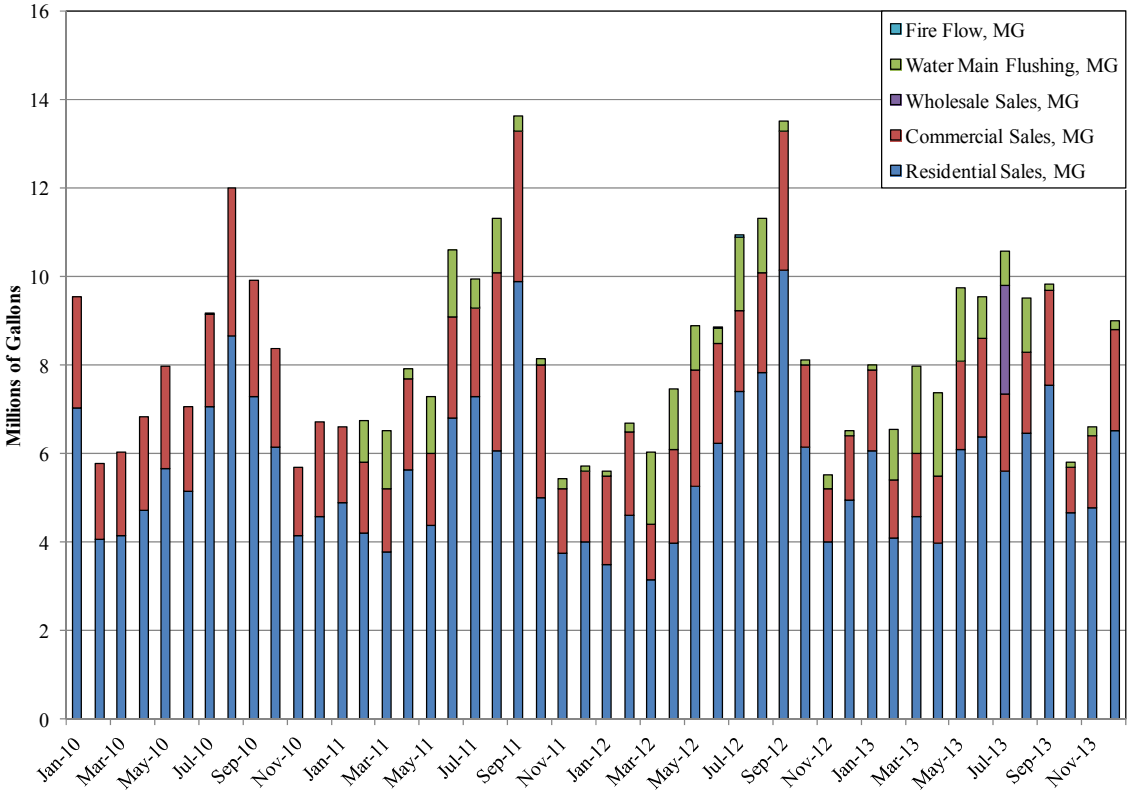


FIGURE 2-4

Monthly Water Use

Annual water usage by category is summarized in Table 2-5.

TABLE 2-5

Annual Water Usage

Year	Residential, MG	Commercial, MG	Wholesale, MG	Fire Flow, MG	Water Main Flushing, MG	Total, MG
2010	68.689	26.435	0.000	0.007	No Data	95.131
2011	65.761	26.127	0.012	0.000	8.030	99.930
2012	67.243	23.900	0.000	0.057	8.300	99.500
2013	66.810	20.932	2.459	0.000	10.390	100.590
Average	67.126	24.348	0.618	0.016	8.907	101.014

From Table 2-5, as well a Figure 2-4, it can be seen that the majority of usage is residential, and that total annual residential and commercial usage has generally declined over the data period.

DISTRIBUTION SYSTEM LEAKAGE

Distribution System Leakage (DSL) is defined as the difference between water metered into the distribution system (net production) and water metered out of the distribution system (total usage). Monthly net water production and monthly water usage are shown graphically in Figure 2-5.

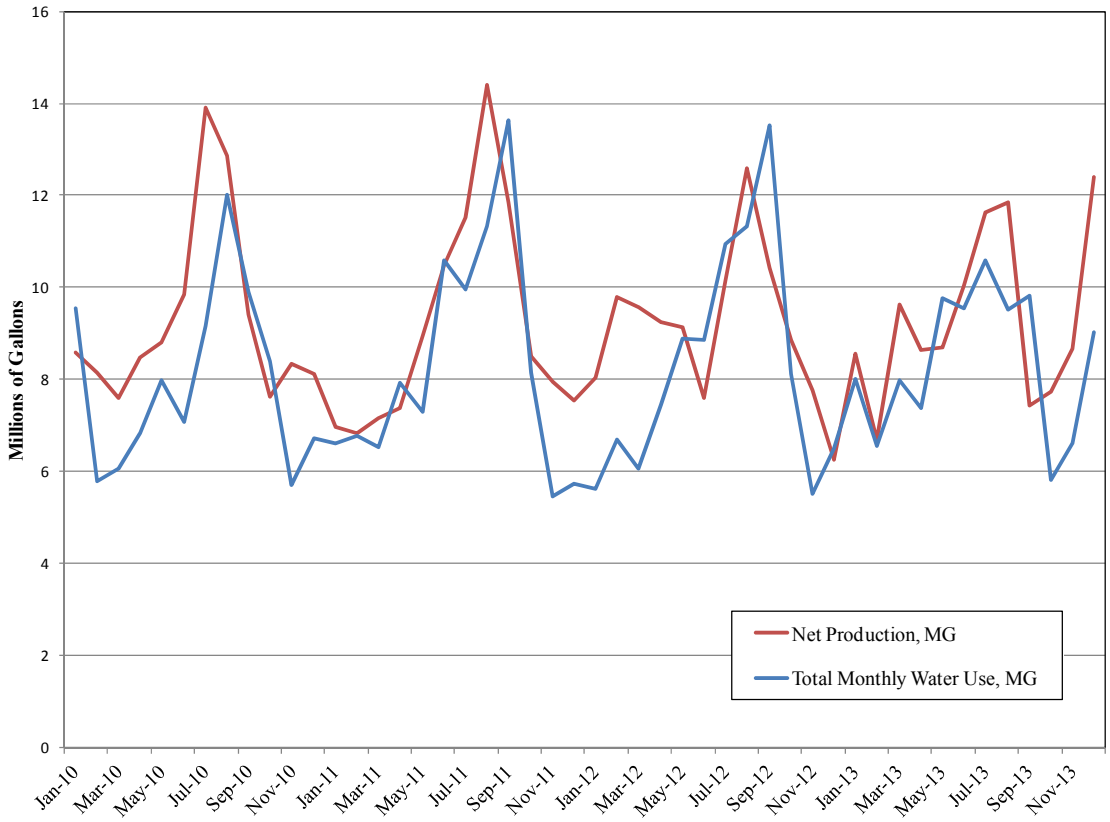


FIGURE 2-5

Monthly Net Production and Water Usage

It can be seen that net water production and total water usage generally closely follow each other. Over the data period, water service meters were read in weekly billing cycles such that all meters would be read within any given calendar month. What this means is that water usage periods actually overlap months, and do not exactly coordinate with metered water production periods. Some notable discrepancies are spring of 2012 and spring of 2013 when water production went up while water usage went down. It is not

known if these discrepancies represent lost water usage data, or system leakage, or possibly inaccurate production data. There are also times when water usage exceeds production. These may be partially due to overlapping service meter reading periods and may also be partially due to service meter data errors and problems with source meters. Annual net production, water usage and distribution system leakage are summarized in Table 2-6.

TABLE 2-6

Distribution System Leakage

Year	Net Production, MG	Total Usage, MG	DSL MG	Percent DSL
2010	111.725	95.131	16.594	14.9%
2011	109.574	99.930	9.644	8.8%
2012	109.415	99.500	9.915	9.1%
2013	111.968	100.590	11.378	10.2%

Based on data available, water usage has tracked fairly closely with water production with a DSL averaging 9.3 percent for 2011 through 2013. DSL in 2010 is higher largely because water main flushing data is not available prior to February 2011. The district states that they have had very unreliable source meters, which will be replaced with new magnetic flow meters as part of the DWSRF project in 2015 and 2016. New radio-read service meters are being installed at the rate of 350 per year and will all be replaced by 2017. After that, service meters will be replaced on an average of every 10 years. Once all meters have been replaced it is expected that water production and sales data will be improved.

EQUIVALENT RESIDENTIAL UNITS

An Equivalent Residential Unit (ERU) is a way to estimate water usage and evaluate water system capacity based on the typical usage of a single family residence on the water system. The value of an ERU is the average daily usage of single family residential units served by the water system, expressed as gallons per day (gpd).

WATER USE PER RESIDENTIAL CONNECTION

Annual residential water use is divided by the average active residential connections for each year, and by 365 days per year to obtain average day water use per residential connection. Table 2-7 summarizes average day residential water use from 2010 through 2013.

TABLE 2-7

Water Use per Active Residential Connection

Year	Residential Water Use, MG[(1)]	Average Active Residential Connections[(2)]	Average Day Water Use per Active Residential Connection, gpd
2010	68.689	1,639	114.86
2011	65.761	1,591	113.25
2012	67.243	1,594	115.59
2013	66.810	1,621	112.93
		Average	114.16

(1) Residential Water User comes directly from Table 2-5.
(2) Average Active Residential Connections are used in Table 2-7 because average water use per active connection should be based on average number of active connections. The average number of active residential connections is taken from the same data use to create Figure 2-3.

Table 2-7 shows residential water use averaging about 114 gpd per connection. This is a very low water use rate, probably due to the relatively cool and damp weather, which means that outdoor irrigation is minimal in the service area, and partly due to the fact that some of the active connections are not active for the entire billing period. **For purposes of this water system plan, the value of an ERU will be 114 gpd per ERU.**

EQUIVALENT RESIDENTIAL UNIT VALUE FOR NON RESIDENTIAL USERS

Each active residential connection is by definition one ERU. Inactive residential and commercial connections by definition have no water use, so they are zero ERUs. Active non-residential connections, other non-residential water use, and DSL can all be expressed as ERUs. The total water use for the year for each water use category is divided by the ERU value of 114 gpd and by 365 days per year to get the number of ERUs represented by the water use category. The average of 83 active commercial connections in 2013 was equivalent to 503 ERUs. The wholesale water use in 2013 was equivalent to 59 ERUs. DSL in 2013 was equivalent to 523 ERUs.

TABLE 2-8

Equivalent Residential Units for 2013

Use Category	2013 Use, MG[(1)]	2013 Average Active Connections[(2)]	Average Day Use, gpd	2013 ERUs[(3)]
Active Residential	66.810	1,621	183,040	1,621
Active Commercial	20.932	83	57,347	503
Wholesale	2.459	0	6,736	59
Fire Flow	0.000	0	0	0
Water Main Flushing	10.390	0	28,466	250
Subtotal, Non-DSL	100.590	1,704	275,589	2,417
DSL	11.378	0	31,173	273
Totals	111.968	1,704	306,762	2,691

(1) Residential, commercial, wholesale, fire flow, and water main flushing use are from Table 2-5. DSL is from Table 2-6.

(2) 2013 Average Active Residential Connections are from Table 2-7. 2013 Average Active Commercial Connections is derived from the water system connections data used to create Figure 2-3.

(3) 2013 ERUs is 2013 Use divided by 114 gpd per ERU and 365 days per year, except that residential ERUs equals the average number of active residential connections regardless of the actual residential use for that year.

MAXIMUM DAY DEMAND PER ERU

As discussed above under the heading, **Maximum Day Production**, the estimated maximum day to average day ratio for NBWD is 2.44. With an average day demand per ERU of 114 gpd, the **maximum day demand is estimated at 278 gpd per ERU.**

PEAK HOUR DEMAND

Peak Hour Demand (PHD) is a value that applies to the system as a whole, not to any individual service, and is estimated using Equation 5-3 from the Water System Design Manual. This formula estimates peak hour system demands, *not including fire flow*:

$$PHD = (MDD/1440)[(C)(N)+F]+18$$

Where

PHD = Peak Hour Demand, gallons per minute
C = Coefficient from Water System Design Manual Table 5-1
N = Number of ERUs served
F = Factor from Water System Design Manual Table 5-1
MDD = Maximum Day Demand per connection, gpd

For a system with more than 500 service connections, C and F are: 1.6 and 225, respectively. As derived above, MDD for the NBWD water system is 278 gpd. Inserting these numbers into the above equation yields the following:

$$PHD = (278/1440)[(1.6)(N)+225]+18$$

This equation simplifies to the following:

$$PHD = 0.309 \times N + 61$$

Using 2,706 estimated ERUs for 2013 from Table 2-8, the estimated peak hour demand for 2013 would be 897 gpm. The above formula will be used to estimate projected peak hour demands.

SUMMARY OF WATER DEMAND FACTORS

Table 2-9 summarizes water demand factors developed in the preceding sections of this Plan.

TABLE 2-9

Summary of Per Connection Water Demand Statistics

Demand Factor	Value
Average Day Demand per ERU, gpd	114
Maximum Day Demand per ERU, gpd	278
Maximum Day to Average Day Factor	2.44
Peak Hour Demand, gpm	0.309 x N + 61[(1)]

(1) N is the number of ERUs served by the system.

FUTURE SYSTEM DEMANDS

To project future NBWD water demands it will be assumed that water use will be proportional to the total number of connections and/or area population. Historic water use factors developed above will be applied to projected full-time equivalent residential connections to estimate future water demands.

PROJECTED LAND USE

The service area has a mixture of different zoning classifications. The largest portion of the land in the service area is zoned Rural Residential (RR). Other zoning in the service area includes Agricultural (AG), Restricted Residential (R1), General Residential (R2), Conservation (CD), Community Commercial (CC), Resort (R3), Mixed Use (MU), and Industrial (IND). The distribution of zoning is roughly proportional to existing customer category distribution.

PROJECTED CONNECTIONS ERUS

County and City Growth Rates

Historic populations for Pacific County and Cities within Pacific County were obtained from the Washington State Office of Financial Management. County population since 1960 and the population of cities within Pacific County since 1968 are shown in Figure 2-6. It can be seen that most of the population of Pacific County lies outside of the incorporated areas of the cities. In fact, less than one third of the Pacific County population lives in cities, while greater than two thirds of the Pacific County population lives in unincorporated areas. Also, over the data period, the populations of the cities have remained relatively flat, while the population of the County has increased. Between 1968 and 2013 the population of incorporated Pacific County areas increased by 12 percent, while the population of unincorporated Pacific County increased by 42 percent. All of the incorporated area population increase took place in the Cities of Long Beach and Ilwaco, while the Cities of Raymond and South Bend decreased in population.

Since 1968 Pacific County as a whole has grown at an average annual rate of 0.78 percent. From 1994 through 2013 the County average annual growth rate was 0.29 percent. OFM data shows that the population in 2004 and 2013 were both 21,000, so the net growth rate over the past ten years has been zero percent, although the data show that the County population grew to 22,100 in 2010 then declined back to 21,000 by 2013. Unincorporated Pacific County grew at an average annual rate of 1.09 percent between 1968 and 2013, at an average annual rate of 0.35 percent between 1994 and 2013 and at an average annual rate of 0.13 percent between 2004 and 2013.

OFM also provides projections of county populations, including low, medium and high series growth projections. The high series projection for Pacific County has population rising from 20,920 in 2010 to 22,000 in 2015, and average annual rate of 1.01 percent, then continuing to rise at a rate of approximately 0.5 percent per year through 2040. The medium series projection for Pacific County has population decreasing from 20,920 in 2010 to 20,860 in 2015, an annual growth rate of -0.06 percent, then growing through 2040 at a rate of 0.1 to 0.3 percent per year. The low series projection for Pacific County has population decreasing from 20,920 in 2010 to 19,999 in 2015, an annual growth rate of -0.90 percent, then remaining more or less constant through 2040. Figure 2-6 shows the high, medium and low Pacific County growth rate projections together with the historic populations discussed above.

Pacific County Comprehensive Plan

The Pacific County 2010 Comprehensive Plan includes population history and growth projections for Ocean Park. Table 2-6 shows that Ocean Park population declined from 827 in 1996 to 679 in 2009, an average annual growth rate of -1.51 percent. The Plan

further projects growth in Ocean Park to 834 by 2030, an average annual growth of 0.98 percent from 2009.

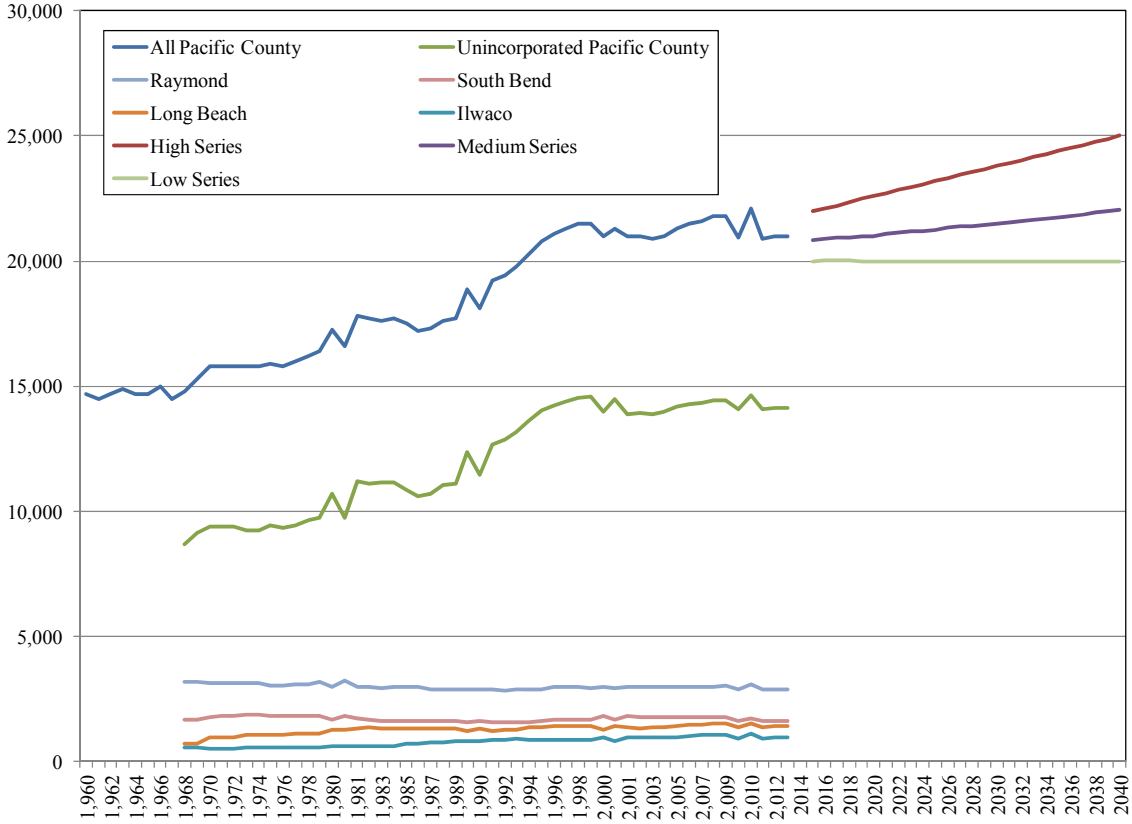


FIGURE 2-6

Historic Pacific County and City Populations

NBWD Growth Projections

Given the various historic growth rates discussed above, plus the connections history discussed previously, there is a range of possible growth rates that could be considered for NBWD. The average annual growth rate in water system connections between November 2007 and December 2013 was 0.26 percent. The average annual growth in unincorporated Pacific County population was 0.35 percent between 1994 and 2013, and was 0.13 percent between 2004 and 2013. The most directly applicable of these growth rates is the historic NBWD connections, because connections data is specific to NBWD. It is also uncertain how good past growth rates are as predictors of future growth rates. On the one hand, as the population ages there may be more people looking to retire in communities like the Ocean Park area, thereby increasing growth rates. On the other hand, remoteness of the location and a lack of employment opportunities may suppress population growth rates.

Given the uncertainties of projected growth rates, the best predictor available for future growth is probably the records of recent historic growth. And the most applicable historic growth rate is the 0.26 percent annual growth rate in system connections. Therefore we will project the annual growth rate for NBWD for the coming 6 year planning period at 0.26 percent annually.

EFFECTS OF WATER CONSERVATION

It is anticipated that the value of an ERU will change as the system grows. With promotion of water conservation, the water usage represented by an ERU may go down. However, for projection of water system needs it is safer to assume that water usage per ERU will not decrease.

PROJECTED NON-REVENUE WATER DEMANDS

Non-revenue water demands include DSL as well as other water uses such as fire protection and line flushing. As the system upgrades it is reasonable to assume that DSL rates will decrease. On the other hand, as the area grows it is reasonable to assume that fire protection and line flushing water use may increase. For water demand projection purposes it will be assumed that line flushing and fire protection water use, and DSL will be proportional to system connections.

WATER RATES AND RATE IMPACTS ON WATER DEMAND

If the NBWD water rate structure is adjusted in the future, that adjustment may have an impact on water usage. The most likely impact of future rate adjustments would be to promote water conservation. However, water usage within NBWD is already very low, so it is not likely that future rate adjustments will have a great impact on water usage rates.

PROJECTED ERUS

ERUs are projected to increase at a rate of 0.26 percent annually, from the 2013 value of 2,691 shown in Table 2-8. Projected ERUs and water system demands, based on demand factors from Table 2-9, are shown in Table 2-10.

FUTURE WATER DEMAND FOR 6- AND 20-YEAR HORIZONS

Projected ERUs

ERUs are projected to increase at a rate of 0.26 percent annually, from the 2013 Total ERUs value of 2,691 shown in Table 2-8.

Projected Average Day, Maximum Day, and Peak Hour Demands

Based on historic water use rates and projected ERUs, estimated future NBWD water demands are shown in Table 2-10. Average day demand is based on Total ERUs times the ADD value of 114 gpd per ERU from Table 2-9. Maximum Day Demand is projected ERUs times the MDD value of 278 gpd per ERU from Table 2-9. Peak Hour Demand is based on projected ERUs and the Peak Hour Demand formula from Table 2-9.

TABLE 2-10

Projected Water System Demands

Year	ERUs (1)	Average Day Demand, gpd(2)	Maximum Day Demand, gpd(3)	Peak Hour Demand, gpm(4)
2015	2,705	308,000	752,000	897
2016	2,712	309,000	754,000	899
2017	2,719	310,000	756,000	901
2018	2,726	311,000	758,000	903
2019	2,733	312,000	760,000	905
2020	2,740	312,000	762,000	908
2021	2,747	313,000	764,000	910
2022	2,755	314,000	766,000	912
2023	2,762	315,000	768,000	914
2024	2,769	316,000	770,000	917
2025	2,776	316,000	772,000	919
2026	2,783	317,000	774,000	921
2027	2,791	318,000	776,000	923
2028	2,798	319,000	778,000	926
2029	2,805	320,000	780,000	928
2030	2,812	321,000	782,000	930
2031	2,820	321,000	784,000	932
2032	2,827	322,000	786,000	935
2033	2,834	323,000	788,000	937
2034	2,842	324,000	790,000	939
2035	2,849	325,000	792,000	941

(1) ERUs are projected forward from Total ERUs as calculated in Table 2-8 at an annual growth rate of 0.26 percent.

(2) Average Day Demand is ERUs times the Average Day Demand value of 144 gpd per ERU from Table 2-9, rounded to the nearest 1,000 gpd.

(3) Maximum Day Demand is ERUs times the Maximum Day Demand value of 278 gpd per ERU from Table 2-9, rounded to the nearest 1,000 gpd.

(4) Peak Hour Demand is based on ERUs and the Peak Hour Demand formula in Table 2-9, rounded to the nearest gpm.

CHAPTER 3

WATER SYSTEM ANALYSIS

OBJECTIVE

The objective of this chapter is to determine if system improvements are necessary to meet water quality standards and to meet projected demands. This chapter addresses the following elements:

- System design standards
- Water quality analysis
- System description and analysis
- Water rights analysis
- Summary of system deficiencies
- Selection and justification of proposed improvements

WATER SYSTEM STANDARDS

This section outlines the various standards that the North Beach Water District (NBWD) is required to, or has chosen to comply with. Standards include Water Quality Standards, and Planning Standards and Design Standards, as outlined in the following sections.

WATER QUALITY STANDARDS

NBWD is a public water supply system regulated by the Washington State Department of Health (DOH) Drinking Water Regulations, WAC 246-290, the latest edition of which is dated March 30, 2012, as well as sections of Code of Federal Regulations (CFR) Title 40, Parts 141 and 143, adopted by reference in WAC 246-290. NBWD has a groundwater supply, so only groundwater supply regulations apply.

PLANNING AND DESIGN STANDARDS

The Standards for planning and design for NBWD are based on commonly accepted standards including the following:

WAC 246-290, Group A Public Water Systems, Washington State Board of Health (July 2004)
This is the primary drinking water regulation used by DOH. It sets basic standards to assess capacity, water quality, and system reliability.

Water Use Efficiency Rule, Washington State Board of Health (January 2007)
The Water Use Efficiency (WUE) Rule is a collection of revisions to WAC 246-290, which have been incorporated into WAC 246-290. The WUE Rule revisions have added to and amended certain definitions, added WUE requirements to water system planning

requirements and small water system management plans, added a new section requiring installation of water service meters, and added new sections on Water Use Efficiency Planning, including Purpose and Applicability, Water Use Efficiency Program, Distribution System Leakage Standard, Water Use Efficiency Goal Setting, and Water Use Efficiency Performance Reports.

Water System Design Manual, Washington State Department of Health (December 2009)
These standards serve as guidance for the preparation of plans and specifications for Group A public water systems in compliance with WAC 246-290.

Standard Specifications for Road, Bridge and Municipal Construction, Washington State Department of Transportation, American Public Works Association (2014)
These standards include detailed specifications for materials and workmanship of a wide variety of public works projects, including installation of public water supply facilities.

North Beach Water District Standard Specifications for Water Main Construction
These standards include detailed specifications for materials and workmanship for installation of water main extensions, including piping installation details, thrust blocking, in-line valves, fire hydrants, air release valves, service connections of various types, sample stations, blow offs, and pavement restoration applicable to developer extensions. A copy of these standards is contained in Appendix E.

SYSTEM CAPACITY STANDARDS

NBWD uses the DOH Water System Design Manual as a guide for establishing water system capacity standards. Table 3-1 lists the recommended standards from the DOH Manual and the NBWD policies with regards to each standard for general facility design.

TABLE 3-1

General Facilities Requirements

Standard	DOH Water System Design Manual	NBWD Standard
Average Day and Maximum Day Demand	Average day demand should be determined from previous metered water production and consumption data.	Average day consumption per ERU is **114 gpd.** The maximum day to average day factor is 2.44, and the maximum day consumption per ERU is **278 gpd**, as developed in Chapter 2 of this Plan.
Peak Hour Demand	Peak hour demand is determined using the following equation: PHD = (MDD/1440)((C)(N) + F) + 18 Where: MDD = Maximum Day Demand in gallons per day per ERU C = Coefficient from DOH Water System Design Manual Table 5-1 N = Number of connections, ERUs F = Factor from DOH Water System Design Manual Table 5-1	Peak hour demand is determined by applying the DOH Water System Design Manual Formula where MDD = 278 gpd per ERU, C=1.6 and F = 225, which simplifies to the equation: **PHD = 0.309 x N + 61**
Minimum System Pressure	The system should be designed to maintain a minimum of 30 psi in the distribution system under peak hour demand and 20 psi under fire flow conditions during MDD.	NBWD will meet or exceed the DOH required minimums.
Maximum System Pressure	Regulations do not address maximum system pressure. The Water System Design Manual, Chapter 8, part 8.1.7, recommends that pressures should not exceed 100 psi.	NBWD does not provide pressure in excess of 100 psi.
Minimum Pipe Sizes	The diameter of a transmission line shall be determined by hydraulic analysis. The minimum size distribution system line shall not be less than 6-inches in diameter, except for dead end lines not providing fire flow and only as justified by a hydraulic analysis.	Same as DOH Water System Design Manual
Valve Spacing	Sufficient valving should be placed to keep a minimum number of customers out of service when water is turned off for maintenance or repair.	Valves every 1,000 feet, three gate valves at every tee and four at every cross unless otherwise directed by the System Manager. Valves on each end of an easement or at each end of a water main in an easement.
Source Reliability	18 hours of source pumping to meet maximum day demand. Source capacity to replenish fire storage capacity within 72 hours while meeting maximum day demand. Redundancy in all critical pumping systems. Backup power supply for all critical pumping systems.	Same as DOH Standard.
Fire Standards	WAC 246-293-640 sets minimum fire flow standards for water systems with 1,000 or more service connections or located in a critical water supply service area. Pacific County has not set any more stringent standards applicable to the North Beach area, and has not disallowed nesting of standby and fire storage. Applicable state standards apply.	State minimum standards apply as follows: Land Use — Flow Capacity — Duration Residential — 500 gpm — 30 Minutes Commercial and Multi-Family — 750 gpm — 60 Minutes Hydrant Spacing: Minimum every 900 feet

Storage Standards

Effective Storage

The nominal volume of a water reservoir is generally taken as the amount of water the reservoir could hold if filled all the way to the top of the reservoir wall. However, practically speaking, a reservoir cannot be filled to the top of the wall and a reservoir also cannot, under normal operational conditions, be drained completely. Therefore, there is a need to determine how much of a reservoir volume is *effective* storage, and how much effective storage a water system needs. Figure 3-1 is a conceptual diagram of a typical reservoir, showing effective, operational and dead storage volumes.

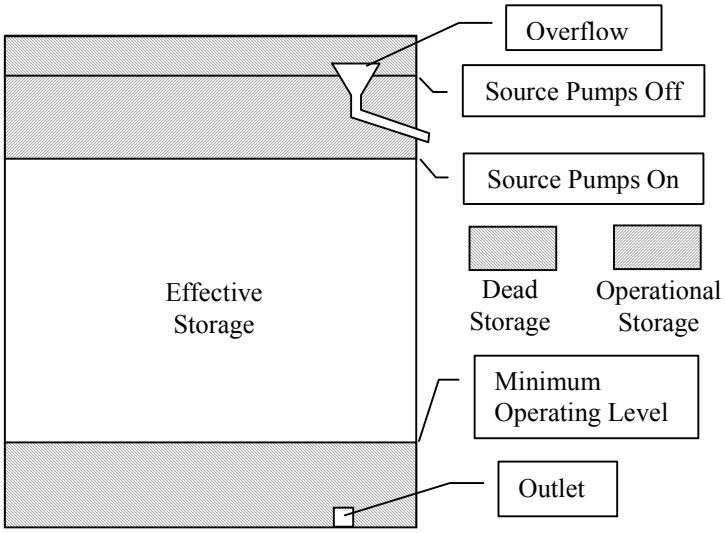


FIGURE 3-1

Typical Reservoir Effective, Operational and Dead Storage Volumes

The DOH Water System Design Manual identifies the following components of reservoir storage volume:

- Operational Storage
- Equalizing Storage
- Standby Storage
- Fire Suppression Storage
- Dead Storage

A reservoir's effective storage volume is the nominal volume less operational storage and dead storage. This volume must be large enough to accommodate the requirements for equalizing storage, standby storage and fire suppression storage.

Operational Storage

Operational storage is the amount of water that flows in and out of a reservoir during normal system control cycling. Reservoirs typically operate with a maximum water level at which all source pumps are turned off, and a minimum level at which all source pumps are turned on. The amount of water between these two levels depends upon the operational control levels and the dimensions of the system's reservoirs. The operational storage volume must be great enough to prevent excessive cycling of source pumps, and it must also be great enough so that the level controls can clearly differentiate between source pump on and off levels.

Equalizing Storage

Equalizing storage is the amount of water needed to meet peak system demand for a period of time when the system demand exceeds the system source capacity. The DOH Water System Design Manual recommends that this volume be estimated as PHD minus source capacity for 150 minutes, but not less than zero.

Standby Storage

Standby Storage is water held in reserve for emergency situations, such as temporary loss of a water source. The DOH Water System Design Manual recommends that this volume be estimated as 2 days of average day demand for the water system, less the amount of water that can be produced by the water system in one day with the largest source of supply out of service, but not less than 200 gallons per ERU.

Fire Suppression Storage

Fire Suppression Storage is the maximum fire flow rate standard times the maximum fire flow duration standard for the water system. The Uniform Fire Code sets minimum building standards based on fire flows available, but does not specifically set fire flow standards for water systems. Pacific County's building and fire code ordinances do not adopt a minimum fire flow standard to be applied to water utilities. WAC 246-293-601, et seq., sets state minimum fire flow standards for water systems with 1,000 or more service connections, or located within a critical water supply service area. NBWD currently has more than 1,000 service connections, so this regulation, at a minimum, applies. Fire flow standards are shown in Table 3-1. The maximum applicable standard for NBWD is 750 gpm for 60 minutes, which is 45,000 gallons of fire suppression storage.

Dead Storage

Dead storage is the volume of the reservoir that either cannot be utilized for storage because it is above the maximum operational water level of the reservoir, or cannot be withdrawn from the reservoir at the required rates while maintaining the minimum

required system pressure or other required operating parameter. The amount of dead storage existing in a system depends on storage system dimensions, elevations, pumping systems, outlet design, and possibly other requirements such as disinfectant contact time.

Effective Storage Requirement

The amount of effective storage a water system needs will be referred to as the Effective Storage Requirement. The Effective Storage Requirement is based on equalizing, standby, and fire suppression storage, and will depend on whether or not "Nested Storage" is allowed. "Nested Storage," pursuant to WAC 246-290-010, means one component of storage is contained within the component of another. WAC 246-290-235 states, "Standby and fire suppression storage volumes may be nested with the larger of the two volumes being the minimum available, provided the local fire protection authority does not require them to be additive." Therefore, the Effective Storage Requirement will be either the sum of equalizing, standby and fire suppression, if "nesting" of standby and fire suppression storage is *not* allowed, or it will be the sum of equalizing storage plus the greater of standby or fire suppression storage if nesting of standby and fire storage *is* allowed. **For the NBWD, no local ordinance or authority has required fire storage to be additive, so nesting of standby and fire storage is allowed.**

WATER QUALITY ANALYSIS

The following sections evaluate the record of water quality for NBWD. Water quality analysis is divided into the categories of Source Water Quality, Delivered Water Quality, Water Quality Reporting, and Water Quality Complaints. Water quality standards that apply to the water distribution system, including coliform, lead and copper, disinfectant byproducts, and asbestos are discussed under the heading of Delivered Water Quality. A review of water quality monitoring requirements relative to water quality monitoring completed is included under the heading Water Quality Reporting, and a review of water quality problems and complaints is included under the heading Water Quality Complaints.

SOURCE WATER QUALITY

As described in Chapter 1, NBWD has eleven wells. The treatment processes provided for NBWD wells are filtration for removal of iron and manganese at all wells.

Inorganic Chemical and Physical Water Quality

General IOC Tests

NBWD's most recent inorganic chemical and physical (IOC) water quality monitoring results are summarized in Table 3-2. The Maximum Contaminant Level (MCL) for all inorganic chemical and physical water quality parameters for which there are MCLs are

listed in the right hand column. All analyses indicating values at or above the MCL are indicated in bold. The only MCL exceedances indicated are arsenic, iron, manganese and color for the Source 12 taken on April 19, 2010. This sample was taken prior to the treatment system. The treatment system removes iron, manganese and arsenic, and iron and manganese were most likely the cause for the color. All samples taken after treatment meet all IOC standards.

TABLE 3-2

Source Inorganic Chemical Sampling Results

Location	Source 6[1]	Source 11[1]	Source 12[2]	Source 10[1]	Source 6[1]	
Sample Date	**3/27/2008**	**4/19/2010**	**4/19/2010**	**7/21/2010**	**4/18/2012**	**MCL[3]**
Primary Contaminants – All results milligrams per liter (mg/L) unless otherwise noted						
Antimony	NA[4]	<0.006	<0.006	<0.006	<0.006	0.006
Arsenic	0.008	0.001	**0.02**	0.008	0.009	0.01
Barium	NA[4]	<0.4	<0.4	<0.4	<0.4	2
Beryllium	NA[4]	<0.0008	<0.0008	<0.0008	<0.0008	0.004
Cadmium	NA[4]	<0.002	<0.002	<0.002	<0.002	0.005
Chromium	NA[4]	<0.02	<0.02	<0.02	0.001	0.1
Copper	NA[4]	<0.02	<0.02	<0.02	<0.02	1.3[5]
Cyanide	NA[4]	<0.01	<0.01	<0.01	<0.01	0.2
Fluoride	NA[4]	<0.5	<0.5	<0.5	<0.5	4[6]
Lead	NA[4]	<0.001	<0.001	<0.001	<0.001	0.015[5]
Mercury	NA[4]	<0.0004	<0.0004	<0.0004	<0.0004	0.002
Nickel	NA[4]	<0.1	<0.1	<0.1	<0.1	0.1
Nitrate-N	<0.2	0.22	<0.2	<0.2	<0.2	10
Nitrite-N	NA[4]	<0.2	<0.2	<0.2	<0.2	1
Total Nitrite/Nitrate	NA[4]	0.22	<0.5	<0.5	<0.5	10
Selenium	NA[4]	<0.01	<0.01	<0.01	<0.01	0.05
Thallium	NA[4]	<0.002	<0.002	<0.002	<0.002	0.002
Secondary Contaminants – All results milligrams per liter (mg/L) unless otherwise noted						
Chloride	NA[4]	15	17	12	29	250
Fluoride	NA[4]	<0.5	<0.5	<0.5	<0.5	2[6]
Iron	0.062	<0.1	**3.67**	<0.1	0.05	0.3
Manganese	0.02	0.018	**0.86**	0.03	0.017	0.05
Silver	NA[4]	<0.1	<0.1	<0.1	<0.1	0.1
Sulfate	NA[4]	**2.7**	0.8	2	5.1	250
Zinc	NA[4]	<0.2	0.077	<0.2	<0.2	5

TABLE 3-2 – (continued)

Source Inorganic Chemical Sampling Results

Location	Source 6[1]	Source 11[1]	Source 12[2]	Source 10[1]	Source 6[1]	
Sample Date	**3/27/2008**	**4/19/2010**	**4/19/2010**	**7/21/2010**	**4/18/2012**	**MCL[3]**
Unregulated Chemicals - All results milligrams per liter (mg/L) unless otherwise noted						
Color (color units)	NA[4]	<15	**80**	10	<15	15
Conductivity (µmho/cm)	NA[4]	144	287	140	281	700
Hardness (as $CaCO_3$)	0.062	38.8	95.5	26.5	84.2	None
Sodium	NA[4]	11.6	19.3	9.17	13.8	20[7]
Total Dissolved Solids	NA[4]	NA[4]	NA[4]	NA[4]	174	500
Turbidity (NTU)	NA[4]	<0.1	0.6	0.21	0.29	1[8]

(1) Samples from Source 6 on 3/27/2008, from Source 11 on 4/19/2010, from Source 10 on 7/21/2010 and from Source 6 on 4/18/2012 were taken at a point after the filter system. Note, Source 6 is the North Well Field including North Wells 1-8. Source 10 is South Well 1, Source 11 is South Well 2, and Source 12 is South Well 4.

(2) Sample from Source 12 on 4/19/2010 was taken prior to treatment.

(3) MCL exceedances are shown in **bold**.

(4) NA signifies that the parameter was not analyzed or not reported in the lab report.

(5) The standards for Lead and Copper are distribution system action levels based on 90th percentile distribution sample values.

(6) Fluoride has both a primary and a secondary MCL. Concentrations above the secondary MCL cause aesthetic problems, while concentrations above the primary MCL are a public health concern.

(7) Sodium does not actually have an MCL, but EPA has established a level of 20 mg/L as a level of concern for individuals on low sodium diet.

(8) The turbidity MCL applies only to unfiltered surface water sources.

Annual Nitrate Tests

Additional IOC samples include annual nitrate samples. These samples are required in years when complete inorganic chemical samples are not required. No nitrates were detected in most of the samples. One sample from Source 6 in 2011 and three samples from Source 10 in 2006, 2009 and 2011 had detectable nitrate. All nitrate test results are well below the MCL of 10 mg/L. The highest level detected in any sample was 1.29 mg/L in a source 10 sample in 2011.

Radionuclides

Radionuclide test reports are summarized in Table 3-3. MCLs are shown on the bottom line of the table. All radionuclide sample results are well below their respective MCL values.

TABLE 3-3

Source Radionuclide Sampling Results

Source	Date	Radium 228, pCi/L	Gross Alpha, pCi/L	Gross Beta, pCi/L
6	12/26/2007	<1		
	5/17/2010	<1	<3	<4
10	6/15/2009	<1	4.5	5.5
	10/26/2009	<1		
11	4/20/2009	1.2	<3	4.6
	8/31/2009	0.856		
	6/26/2012	<1		
	12/17/2012	<1		
12	6/15/2009	<1	3.1	5.9
	9/15/2009	<1		
MCLs		**5**	**15**	**50**

Volatile Organic Chemicals

Since the beginning of 2008 NBWD has taken six source Volatile Organic Chemical (VOC) samples. Table 3-4 summarizes the test results for those samples. The only VOCs detected in any sample were trihalomethanes (THMs), including bromodichloromethane ($BrCl_2CH$), dibromochloromethane (Br_2ClCH), and bromoform (Br_3CH). THMs are typically formed by the chlorination of water supplies containing organic matter. THMs can also form when ozone reacts with organic matter and bromide. Four of the samples are labeled as treated water and two are labeled as untreated water. No VOCs, including THMs, were found in either untreated water sample, indicating that the THMs are not coming from the source water, but rather are being formed in the treatment process. The MCL for THMs is no more than an annual average of 80 µg/L total trihalomethanes (TTHMs) at any distribution system monitoring site. Source TTHMs are well below that standard. Distribution system TTHMs are discussed further under the subject of delivered water quality.

TABLE 3-4

Source VOC Sampling Results

Source	Date	Treated	$BrCl_2CH$, µg/L	Br_2ClCH, µg/L	Br_3CH, µg/L	TTHM, µg/L
S11	3/27/2008	Y	0.4	2.2	4.3	6.9
S01	3/27/2008	Y		1	1.6	2.6
S12	6/30/2008	Y	0.8	1.4	1.5	3.7
S10	6/15/2009	N	0	0	0	0
S11	6/15/2009	N	0	0	0	0
S06	10/5/2010	Y	0	0	0	0

Synthetic Organic Chemicals

Since 2002, only two samples have been taken by NBWD for synthetic organic chemicals (SOCs). These two samples were both taken from Source 6, the North Well Field, on June 15, 2009. One test was for general pesticides and one was for chlorophenoxy herbicides. No SOC chemicals were detected in either sample.

DELIVERED WATER QUALITY

Delivered water quality applies to a number of water quality monitoring requirements of the water distribution system. Monitoring of delivered water quality is necessary because some water quality parameters have been demonstrated to change in the distribution system, or even in the plumbing of buildings. The following sections summarize delivered water quality monitoring by NBWD.

Coliform Bacteria Monitoring

WAC 246-290-300(3) sets distribution system coliform monitoring requirements, and WAC 246-290-310(2) sets coliform bacteria maximum contaminant levels. The number of routine coliform samples required per monitoring period is based on the population served during the monitoring period as reported on the system's WFI form. Each monitoring period is a calendar month. The number of coliform samples required for NBWD per monitoring period varies by month due to seasonal variations in reported population served. Required sampling is as follows:

- January through March: 6 samples per month
- November and December: 7 samples per month
- April, May and October: 8 samples per month
- June through September: 9 samples per month

As the population changes, the monitoring requirements also change. Monitoring requirements in past years may have been different from these, as monitoring in future years may also change due to shifting spatial and temporal population distribution.

In general, a coliform MCL violation occurs when two or more coliform samples in one sampling period, or greater than five percent of all samples, have detectable coliform bacteria. An Acute MCL occurs if there is an MCL violation and any of the coliform positive samples are positive for Fecal Coliform or E. Coli. A Non-Acute MCL occurs if there is an MCL violation and none of the coliform positive samples are positive for Fecal Coliform or E. Coli.

The coliform monitoring record since 1999 was reviewed for this report. No samples were positive for fecal coliform or E. Coli, but there have been samples positive for total coliform. Dates of total coliform detections and number of positive samples are as follows:

- December 16, 2003 1 positive
- April 25, 2007 2 positive
- August 27, 2007 1 positive
- May 17, 2011 1 positive
- November 27, 2012 2 positive
- December 3, 2012 1 positive

Since two or more positive samples are required for a coliform MCL violation, the above positive samples only include two coliform MCL violations: April 2007 and November 2012. All of the positive coliform samples, except the December 3, 2012 sample, were routine samples, and the associated repeat samples were negative. The December 3, 2012 sample was one of six repeat samples and two source samples taken as follow-up for the two positive samples from November 27, 2012. There were also six additional investigative samples taken on December 10, 2012 that were all negative for total coliform.

Since January 2003 there have been 612 coliform samples reported to DOH for water system ID No. 63000C (currently North Beach Water District, formerly North Beach PDA and Ocean Park Water Company) and 100 coliform samples reported to DOH for water system ID No. 20051V (Pacific Water Company, now part of NBWD), a total of 712 samples for what is now NBWD. Out of these 712 samples there have been a total of six samples positive for total coliform and none positive for fecal coliform or E. Coli. These positive coliform samples account for only two non-acute coliform MCL violations. Positive coliform test results may occur due to several possible causes, including sampling error, contaminated sample bottles, lab error, and system contamination. The positive samples discussed above may represent occasional system contamination events or may represent some other occasional issues.

Disinfectant Byproduct Monitoring

Disinfectant Byproduct (DBP) monitoring is applicable to all water systems that provide water treated with chemical disinfectants. While NBWD does not treat water for the purpose of disinfection, NBWD has used ozone to oxidize iron, manganese and arsenic in the source water so that they can be filtered out in the system filters, and ozone is classified as a chemical disinfectant. Systems that treat water with ozone are required to monitor their distribution system for bromate. WAC 246-290-300 (6) (b) (iii) directs that water system using ozone for disinfection or oxidation must monitor for bromate in accordance with 40 CFR 141.132 (b) (3) (ii) (B). 40 CFR 141.132 (b) (3) (i) states that water system using ozone must take one sample per month for each treatment plant at the entrance to the distribution system. 40 CFR 141.132 (b) (3) (ii) (B) states that the sampling frequency may be reduced to quarterly if the system's running annual average bromate concentration is less than or equal to 0.0025 mg/L, but must return to monthly sampling any time the running annual average exceeds 0.0025 mg/L.

WAC 246-290-310 (4) (b) lists the MCL for bromate as 0.010 mg/L. 40 CFR 141.133 (b) (2) states that compliance with the bromate DBP standard shall be based on a running arithmetic average, computed quarterly, of all monthly samples, except that if more than one sample is taken in any given month the average of samples for that month shall be used as the value for that month.

Bromate Monitoring Results

Since January 2005, 164 bromate samples were taken from the entry points to the water system at the south wellfield and the north wellfield. Quarterly annual running averages of average monthly sample results are summarized in Table 3-5. Annual average bromate has never exceeded the MCL of 0.01 mg/L. The highest annual average was for the year ending June 30, 2011 at 0.0075 mg/L. The lowest annual average is for the year ending December 31, 2013 at 0.0007 mg/L. Since the year ending December 31, 2012, the quarterly calculated annual running averages for bromate have remained below 0.0025, so the NBWD appears to qualify for a reduction to quarterly monitoring. In fact, as described Chapter 1, since the filter system is doing an acceptable job of removing iron and manganese without the use of ozone, NBWD has discontinued operation of the ozone generator for both the NWF and the SWF treatment systems. This is why the annual running average for bromate has dropped off sharply beginning in March 2013.

TABLE 3-5

Bromate Monitoring Results

Year Ending	Running Annual Average, mg/L	Year Ending	Running Annual Average, mg/L	Year Ending	Running Annual Average, mg/L
12/31/2008	0.0056	9/30/2010	0.0059	6/30/2012	0.0039
3/31/2009	0.0036	12/31/2010	0.0046	9/30/2012	0.0028
6/30/2009	0.0030	3/31/2011	0.0047	12/31/2012	0.0022
9/30/2009	0.0036	6/30/2011	0.0075	3/31/2013	0.0009
12/31/2009	0.0045	9/30/2011	0.0070	6/30/2013	0.0010
3/31/2010	0.0056	12/31/2011	0.0071	9/30/2013	0.0010
6/30/2010	0.0048	3/31/2012	0.0070	12/31/2013	0.0007

Asbestos

Asbestos fibers are measured as million fibers per liter greater than 10 micrometers in length (MFL>10 μm). The MCL is 7 MFL>10 μm. Two water samples are on record for asbestos. The first asbestos sample was taken on September 16, 1999, at Weller and SR 103. The lab report for the first sample indicates less than 0.098 MFL>10 μm. The second asbestos sample was taken on September 15, 2010 from the corner of 180th and Pacific Highway. The lab report for the second sample indicated 1.4 MFL>10 μm. Based on this sampling record, NBWD is in compliance with the standard for asbestos in the distribution system.

Lead and Copper Monitoring

Lead and copper monitoring is to determine if lead or copper are leaching out of customer service lines at a rate that produces concentrations that are a health concern. The rule requires that 90 percent of the representative samples do not exceed the action levels for lead or copper. If more than the allowable number of samples exceed the action level for either lead or copper, then the water system owner must take action to reduce the corrosivity of the water, or take other actions such as water service line replacement, to reduce the level of lead and copper at the tap. The action level for lead is 0.015 mg/L and the action level for copper is 1.3 mg/L.

Two rounds of lead and copper samples were collected in 2008, one round of sixteen samples in June and July, plus one round of eleven samples in September and October, and one round of twenty samples was taken in July through September of 2011. Previous samples were also taken earlier and reported in the previous water system plan. The highest level of lead was 0.006 mg/L in September 2008, which was also the highest 90th percentile level. The highest level of copper was 0.573 mg/L in September 2011, and the highest 90th percentile for copper was 0.361 mg/L in August 2011. Table 3-6

summarizes NBWD's lead and copper monitoring results. The data shows that NBWD is in compliance with the lead and copper standards.

TABLE 3-6

Lead and Copper Monitoring Results, 2008 - 2011

Percentile Rank	June – July 2008		Sept. – Oct. 2008		July – Sept. 2011	
	Lead, mg/L	Copper, mg/L	Lead, mg/L	Copper, mg/L	Lead, mg/L	Copper, mg/L
Highest Level	0.005	0.300	0.006	0.287	0.003	0.573
90th Percentile	0.005	0.300	0.006	0.287	0.003	0.361
Action Level	0.015	1.300	0.015	1.300	0.015	1.300

WATER QUALITY MONITORING AND REPORTING

General water quality monitoring requirements are summarized in WAC 246-290-300. NBWD has obtained several water quality monitoring waivers, which affect the monitoring requirements. Table 3-7 summarizes NBWD's monitoring requirements as shown on the Water Quality Monitoring Report for the Year 2014.

TABLE 3-7

Source Monitoring Requirements and Waivers for 2014

Monitoring Parameter	Sampling Requirement	Sampling Location
Coliform	6 per month Jan – Mar 7 per month Nov – Dec 8 per month Apr, May, Oct 9 per month June – Sept	Distribution System per Coliform Monitoring Plan
Asbestos	1 per 9 years	Distribution System
Lead and Copper	1 round per 3 years	Distribution System
Nitrate	1 per year per source	S-06, S-10, S-11
IOC	1 per 3 years	S-10
	1 per 9 years	S-06, S-11
VOC	1 per 6 years	S-06, S-10, S-11
Herbicides, SOC 515.2	1 per 3 years	S-10, S-11
	1 per 9 years	S-06
General Pesticides, SOC 525.2	Waiver Jan 2014 – Dec 2016	S-06, S-10, S-11
EDB and fumigants, SOC 504	Waiver Jan 2014 – Dec 2016	S-06, S-10, S-11
Insecticides, SOC 531.1	Blanket State Waiver	All Sources
Dioxin, SOC 1613	Blanket State Waiver	All Sources

TABLE 3-7 – (continued)

Source Monitoring Requirements and Waivers for 2014

Monitoring Parameter	Sampling Requirement	Sampling Location
Endothall, SOC 548.1	Blanket State Waiver	All Sources
Glyphosphate, SOC 547.1	Blanket State Waiver	All Sources
Diquat, SOC 549.1	Blanket State Waiver	All Sources

WATER QUALITY COMPLAINTS

NBWD handles water quality complaints pursuant to their policy for dealing with complaints as described in Chapter 1. In response to dirty water complaints, a water operator will generally check out the validity of the complaint by an on-site investigation and flush water mains if appropriate.

SYSTEM DESCRIPTION AND ANALYSIS

The following sections evaluate the existing water system facilities in terms of their capacities, physical conditions, and performance capabilities. Facilities are evaluated relative to existing and projected requirements based on growth and demand projections from Chapter 2.

SOURCES

The NBWD wells are described in Chapter 1. Figure 3-2 is a conceptual schematic diagram of how the two well fields, storage tanks and booster pump stations operate.

The north well field and south well field both have filtration systems for iron and manganese, using ozone as an oxidant and polymer as a flocculant and filter aid. Both systems discharge into reservoirs, and both have booster pump stations that pump out of the reservoirs and into the distribution system.

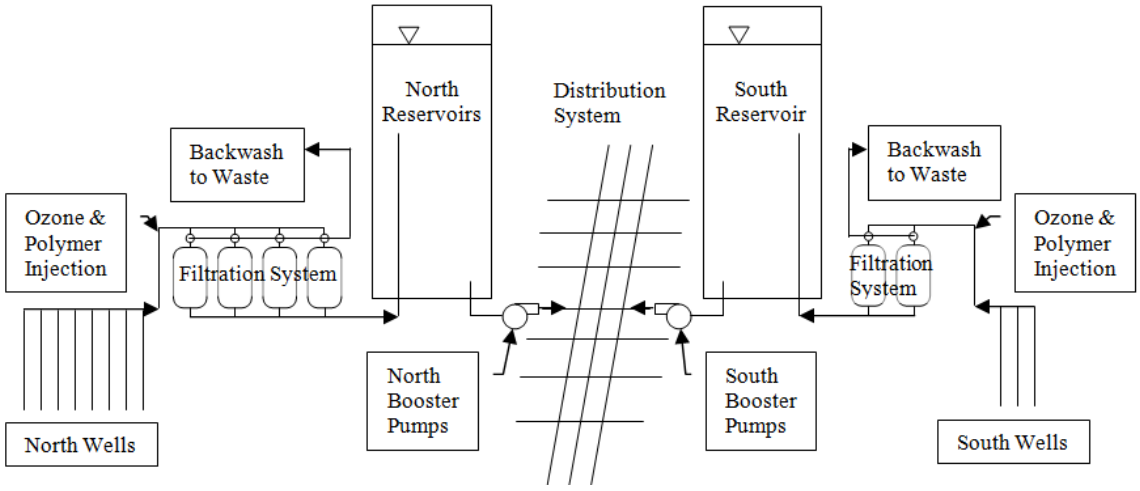


FIGURE 3-2

Schematic Diagram of Water System

Water Rights

Current and Historic Withdrawals

The NBWD water rights are summarized in Table 1-2. NBWD has a total water right capacity of 1,100 gpm and 696 ac-ft/yr. Installed source capacities of all wells are summarized in Table 1-3. NBWD has a combined installed pump capacity of 915 gpm. Therefore, NBWD's installed pumping capacity is well within NBWD's instantaneous water rights limits.

From Table 2-1 it can be seen that NBWD's maximum annual usage since 2008 has been 139.55 MG, which is 428.27 ac-ft/yr. Therefore, NBWD's annual usage is also well within NBWD's annual water rights limits.

Projected Withdrawals

Projected withdrawal rate requirements are compared to current water rights in Table 3-8. Average day demand and maximum day demand projections come from Table 2-11. Recommended Source Capacity is the capacity required to meet Maximum Day Demand in 18 hours per day of production. Projected annual water demand is average day demand, plus 3.1 percent for filter backwash, times 365 days per year and divided by 325,851 gallons per acre-foot. Table 3-8 shows that NBWD has adequate water rights to meet projected demands for the 20-year planning horizon. If growth and water usage develop as predicted, NBWD will have 439 gpm and 357 ac-ft/yr of surplus water right available by the year 2035.

TABLE 3-8

Projected Water Rights Status

Year	Recommended Source Capacity, gpm[(1)]	Instantaneous Water Rights Surplus/(Deficit), gpm[(2)]	Projected Annual Water Demand, ac-ft/yr[(3)]	Annual Water Rights Surplus/(Deficit), ac-ft/yr[(4)]
2015	696	404	356	340
2016	698	402	357	339
2017	700	400	358	338
2018	702	398	360	336
2019	704	396	361	335
2020	706	394	361	335
2021	707	393	362	334
2022	709	391	363	333
2023	711	389	364	332
2024	713	387	365	331
2025	715	385	365	331
2026	717	383	366	330
2027	719	381	368	328
2028	720	380	369	327
2029	722	378	370	326
2030	724	376	371	325
2031	726	374	371	325
2032	728	372	372	324
2033	730	370	373	323
2034	731	369	375	321
2035	733	367	376	320

(1) Recommended source capacity is the minimum source capacity necessary to meet projected Maximum Day Demand, from Table 2-10, in 18 hours of pumping.

(2) Instantaneous Water Rights Surplus is the total available instantaneous water rights of 1,100 gpm from Table 1-2, less the Recommended Source Capacity.

(3) Projected Annual Water Demand is annual production required to meet Average Day Demand from Table 2-10 plus 3.1 percent for filter backwash, times 365 days per year, and divided by 325,851 gallons per acre-foot.

(4) Annual Water Rights Surplus is the total available annual water rights of 696 ac-ft/yr from Table 1-2, less the Projected Annual Water Demand.

Source Capacity Analysis

Table 1-3 shows that the existing wells have a combined installed withdrawal capacity of 915 gpm, counting emergency only wells. As shown in Table 3-8 above, the highest projected source capacity recommendation is 733 gpm. Therefore, counting emergency sources, the NBWD water system has adequate source capacity over the 20-year demand projection. However, Table 1-3 shows that NBWD has 535 gpm of source capacity

counting only active sources. This is 198 gpm less than the projected recommended capacity of 733 gpm for the year 2035. In 24 hours of continuous production, the current active sources can produce a total of 770,400 gallons, which, according to the projections in Table 2-10, is adequate through the year 2024.

As noted in Chapter 1, NBWD has drilled and tested three new wells, the Wiegardt wells, near the SWF. These three wells each tested at 150 gpm. If each of these wells is equipped to produce 120 gpm, the total active source capacity will be increased by 360 gpm to a total of 895 gpm, which will exceed the projected recommended source capacity for 2035.

Currently, use of the Wiegardt wells is pending approval by Ecology for new points of withdrawal under the current water right, which is anticipated to occur in the near future. Based on this analysis, NBWD may be able to get by without using any of the emergency wells until the new Wiegardt wells are on line. If needed, one or more of the emergency wells can be put into service temporarily until the new wells are on line.

Backup Power Supply

Each well site has two backup generators. The north well field has two 150 KW diesel generators with automatic transfer switches, which, combined, are capable of powering all facilities at the north well field. Each of these generators has a 220-gallon fuel tank capable running the generator for 18 hours at full load. The south well field has one 150 KW diesel generator and one 30 KW diesel generator. Both of these generators are also on automatic transfer switches and have fuel tanks capable of supplying fuel for extended periods. These two generators combined are capable of operating all equipment at the south well field 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. The generators are in good condition and exercised regularly so that they are ready to operate when needed.

WATER TREATMENT

NBWD has water treatment facilities at both well fields. The north wellfield treatment facility has a capacity of 800 gpm. The south wellfield treatment facility has a design capacity of 100 gpm. Both treatment systems are for the purpose of removing iron, manganese and arsenic from the source water, and use similar treatment schemes. Both treatment systems utilize ozone to oxidize the iron, manganese and arsenic to low solubility oxidation states, detention time to allow for the formation of particles that can be filtered from the water, and catalytic granular media pressure filters to remove the iron, manganese and arsenic. The filter systems are in good working order and have been effective in removing the target contaminants, as attested to by the inorganic chemical sampling results showing no exceedances for iron, manganese or arsenic in the treated water since the filters have been in operation. NBWD is currently experimenting with the treatment system to determine if they can attain an adequate level of treatment using

just air or oxygen, without having to use ozone. Preliminary results of this study are promising, but final results are not yet available.

STORAGE

The existing system has four cast-in-place concrete reservoirs, as described in Chapter 1. Three reservoirs are located at the NWF facility and one is located at the SWF facility. All the three reservoirs at the NWF facility are 26 feet in diameter and 45-feet tall. The SWF reservoir is 30 feet in diameter by 40-feet tall.

General Condition

The tanks were last inspected and cleaned over 6 years ago. The reservoirs and the vents and hatches were found to be in good condition. There are no noticeable leaks or problems with the reservoirs. NBWD plans to have the reservoirs cleaned and inspected in 2015.

Storage Capacity Analysis

Existing Effective Storage

As described earlier in this chapter, the effective storage capacity is that capacity of the reservoir that is reliably available in the reservoir and capable of being withdrawn from the reservoir at the rates and pressures required for the water use purposes. The three North Well Field Reservoirs are essentially identical 26-foot diameter by 45-foot tall, cast-in-place concrete reservoirs. The South Well Field reservoir is 30 foot diameter, 40-foot-tall cast-in-place concrete reservoir. Details regarding dimensions and capacities of the four reservoirs are presented in Table 3-9. The telemetry control system for the well pumps is currently nonfunctional. Wells are turned on and off manually. There is a pending project for NBWD to upgrade their telemetry control system. Based on the physical dimensions and preliminary water levels control settings shown in Table 3-9 it is estimated that the effective storage capacity of each of the three NWF reservoir is 153,722 gallons, and the effective capacity of the SWF reservoir is 178,221 gallons, for a total estimated effective storage capacity of 639,386 gallons.

TABLE 3-9

Reservoir Dimension and Capacity Details

Parameter	NWF Reservoirs, Each	NWF Reservoirs, Total	SWF Reservoir	Total, All Reservoirs
Diameter, feet	26		30	
Gallons per Foot	3,972	11,915	5,288	17,203
Height to Top of Wall, feet	45		40	
Gross Volume, gal	178,723	536,169	211,507	747,676
Height to Overflow, feet	44		39	
Source Pumps Off Level, feet	43.5		38.5	
Source Pumps On Level, feet	40		35	
Pump Cycle Volume, gal	13,901	41,702	18,507	60,209
Reservoir Outlet Height, feet	1		1	
Outlet Pipe Diameter, in	8		8	
Minimum Operating Level, feet	1.30		1.30	
Effective Storage Volume, gal	153,722	461,165	178,221	**639,386**

Effective Storage Standards

Storage standards for NBWD are based on recommendations of the Department of Health Water System Design Manual. The Design Manual recommends an effective storage standard, where nesting is allowed, based on the sum of the following:

- Equalizing Storage, plus the greater of:
    - Standby Storage, or
    - Fire Suppression Storage

Equalizing Storage

Equalizing storage is used to meet peak hour demands that exceed the installed system source capacity. The volume of equalizing storage recommended depends on peak hour system demands, the length of time the peak hour demands persist, the source production rate, and the mode of system operation. Sufficient equalizing storage must be provided in combination with available water sources and pumping facilities such that peak system demands can be satisfied.

The Water System Design Manual recommends that equalizing storage be calculated using the following equation, but in no case should it be less than zero:

$$V_{ES} = (Q_{PH} - Q_S) \times 150 \text{ minutes}$$

Where

V_{ES} = Equalizing storage component, gallons
Q_{PH} = Peak hourly demand, gpm
Q_S = Total source of supply capacity, excluding emergency sources, gpm

Q_{PH} is the Peak Hour Demand from Table 2-11. Q_S is the active system source capacity of 535 gpm as shown in Table 1-3. Resultant equalizing storage requirements are shown in Table 3-10.

Standby Storage

Standby storage is provided in order to meet demands in the event of a system failure such as a power outage, an interruption of supply, or break in a major transmission line. The amount of emergency storage should be based on the reliability of supply and pumping equipment, standby power sources, and the anticipated length of time the system could be out of service.

The Water System Design Manual recommends that standby storage be calculated using the larger of the following two equations:

$$V_{SB} = 2(ADD)*(N)-T_m*(Q_S-Q_L)$$

Or

$$V_{SB} = 200 \text{ gallons} \times N$$

Whichever is greater, where

V_{SB} = Total standby storage component, gallons
ADD = Average daily demand per ERU, gpd per ERU
N = Number of ERUs for the design year
Q_S = Total source of supply capacity, excluding emergency sources, gpm
Q_L = Capacity of the largest single source serving the system, gpm
T_m = Maximum time remaining sources will be allowed to pump per day, minutes.

The recommended standby storage capacity for NBWD, according to the above formulas, is summarized in Table 3-10. Average Day Demand and number of ERUs are from Table 2-11. Q_S minus Q_L is 400 gpm, as shown in Table 1-3. T_m is assumed to be

18 hours per day of source pumping. Recommended standby storage capacities for years 2015 through 2035, based on the DOH Water System Design Manual, are shown in Table 3-10.

Fire Suppression Storage

Fire suppression storage is provided to ensure that water for fighting fires is available when necessary. Fire suppression storage also reduces the impact of firefighting on distribution system water pressure. The amount of water required for firefighting purposes is specified in terms of rate of flow in gallons per minute (gpm) and an associated duration. Fire flows must be provided at a residual water system pressure of at least 20 pounds per square inch (psi) at all water service connections.

Fire suppression storage is calculated using the following equation:

$$V_{FSS} = FF * T_m$$

Where

V_{FSS} = Volume of fire suppression storage component, gallons
FF = Fire flow rate, gpm
T_m = fire flow duration, minutes

NBWD's maximum fire flow standard is 750 gpm for 60 minutes. The associated fire suppression storage for this fire flow standard is 45,000 gallons. The fire suppression storage volume of 45,000 gallons is shown in Table 3-10. Because nesting of fire and standby storage is allowed, the total storage requirement is equalizing storage plus standby or fire suppression storage, whichever is greater.

Total Recommended Effective Storage

The total recommended effective storage capacities are summarized in Table 3-10 together with Existing Effective Storage as calculated in Table 3-9, and the projected storage surplus or deficit. Table 3-10 shows that NBWD has adequate storage to meet the recommendations of the DOH Water System Design Manual, as interpreted above, throughout the 20-year planning horizon, with a minimum surplus of 8,686 gallons. Note that when the new Wiegardt wells are put into service in 2015, calculated storage requirements will decrease due to decreased equalizing storage requirement. However, standby storage requirement will not decrease because even with the five existing sources in emergency status, the standby storage requirement is controlled by the 200 gallons per ERU minimum standard.

TABLE 3-10

Projected Effective Storage Capacity Recommendations

Year	Recommended Effective Storage, gallons				Existing Effective Storage, gallons[4]	Storage Surplus/ (Deficit), gallons
	Equalizing[1]	Standby[2]	Fire Suppression	Total[3]		
2015	54,300	541,000	45,000	595,300	639,386	44,086
2016	54,600	542,400	45,000	597,000	639,386	42,386
2017	54,900	543,800	45,000	598,700	639,386	40,686
2018	55,200	545,200	45,000	600,400	639,386	38,986
2019	55,500	546,600	45,000	602,100	639,386	37,286
2020	55,950	548,000	45,000	603,950	639,386	35,436
2021	56,250	549,400	45,000	605,650	639,386	33,736
2022	56,550	551,000	45,000	607,550	639,386	31,836
2023	56,850	552,400	45,000	609,250	639,386	30,136
2024	57,300	553,800	45,000	611,100	639,386	28,286
2025	57,600	555,200	45,000	612,800	639,386	26,586
2026	57,900	556,600	45,000	614,500	639,386	24,886
2027	58,200	558,200	45,000	616,400	639,386	22,986
2028	58,650	559,600	45,000	618,250	639,386	21,136
2029	58,950	561,000	45,000	619,950	639,386	19,436
2030	59,250	562,400	45,000	621,650	639,386	17,736
2031	59,550	564,000	45,000	623,550	639,386	15,836
2032	60,000	565,400	45,000	625,400	639,386	13,986
2033	60,300	566,800	45,000	627,100	639,386	12,286
2034	60,600	568,400	45,000	629,000	639,386	10,386
2035	60,900	569,800	45,000	630,700	639,386	8,686

(1) Equalizing Storage is peak hour demand from Table 2-11, minus the existing source capacity of 915 gpm, times 150 minutes. Equalizing Storage is always zero, because source capacity of 915 gpm always exceeds peak hour demand.

(2) Standby Storage is two days of average day demand from Table 2-11, minus 18 hours of pumping at the existing source capacity of 780 gpm, or it 200 gallons per ERU, whichever is greater In this case, 200 gallons per ERU is always greater.

(3) Total Recommended Storage is the sum of equalizing, plus the greater of standby or fire suppression storage. In this case, equalizing storage is always zero and standby storage is always greater than fire suppression storage, so Total Recommended Storage is Standby Storage.

(4) Existing Effective Storage Capacity is from Table 3-9.

BOOSTER PUMP SYSTEM

Booster Pump System Capacity

As shown in Table 1-4, the two booster pump systems are capable of up to 2,969 gpm with one of the large pumps out of service, and up to 3,719 gpm with all pumps operational. The booster pump system must be capable of meeting average flow on a maximum demand day plus fire flow, or capable of meeting peak hour demand,

whichever is greater, with one pump out of service. The highest peak hour demand shown in Table 2-10 is 941 gpm. The highest maximum day demand is 792,000 gpd, which is an average flow of 550 gpm. With a fire flow standard of 750 gpm, the maximum capacity the pumping system must meet is 1,300 gpm, so from a capacity standpoint, the existing booster pump system capacity is adequate to meet projected demands.

Booster Pump System Reliability

The fact that there are two separate booster pump systems that feed the system from two different locations adds a degree of reliability to the system. If for any reason one pump system becomes inoperable, the other pump system can supply the distribution system. As shown in Table 1-4, the NWF booster pump system is capable 1,869 gpm. The SWF booster pump system is capable of 1,850 gpm. So with either booster pump system completely out of service, the pumping system is still capable of meeting maximum system demand

DISTRIBUTION SYSTEM

The water distribution system includes all the piping distributing water from the source and storage facilities to the water customers. The following sections evaluate the general condition and the hydraulic capacity of the water distribution system.

General Description and Condition

The NBWD water distribution system is described in general terms in Chapter 1 under the heading "Transmission and Distribution System." The water distribution system has water mains of various ages, materials and sizes. Total length of water mains by water main diameter is shown in Table 1-5. The material of the mains is a combination of AC and PVC primarily. The older 4-inch and larger PVC is primarily SDR 26, rated for 160 psi. The AC pipe is mostly class 150. The older 3-inch and smaller PVC is class 200 or Schedule 40. Water mains installed since 2007 are all C900 PVC. Water main breaks have not been a significant issue for NBWD.

From Table 1-5, over 50 percent of the water distribution system is 2-inch water main. Based on mapping available, there are currently no fire hydrants located on any water main less than 6 inches in diameter. However, there are significant areas with no fire hydrants at all. WAC 246-293-650 (2) says that for all water systems with 1,000 or more service connections "fire hydrants shall be located at roadway intersections wherever possible and the distance between them shall be no further than 900 feet." To comply with this regulation NBWD will need to install a significant number of new fire hydrants, which will also require replacement of a significant amount of smaller water main with new 6-inch or larger water mains. As water mains are be replaced, NBWD will upgrade them to 6-inch or larger and install fire hydrants.

Water Distribution System Looping

The water system is generally well looped with a minimal number of system dead-ends, or areas served by just one water main, particularly in the main part of the community or Ocean Park. However, the system does have certain dead-end areas. All services on and off from Sandridge Road north of 272nd Place are on one long dead-end line. North Addition, north of 272nd Place, has a single loop fed by a single line. J Lane north of 268th Place is a long dead end line. The Ridgewood development consists of a number of short cul-de-sacs off Birch Place, all of which are dead end lines. Ocean Meadows Unit One is served by one dead-end line. Several lanes extending west from SR 103 south of 237th Place are served by dead-end lines, and all services on and off from SR 103 south of 227th Street is one long dead-end line. Furthermore, all services off Birch Place south of 227th Place are served from a single 6-inch main. The presence of North-South oriented lakes, marshes and ridges makes tying in the system between SR 103 and Sand Ridge Road difficult. However, there may be opportunities as the system continues to develop to tie in some of the long dead-end lines to create large loops.

Interties

NBWD currently has no interties with other utilities. The only utility nearby that would have the capacity to provide assistance to NBWD in the event of a system emergency is Surfside HOA. However, Surfside HOA is not currently interested in creating an intertie with NBWD. As NBWD continues to expand to the south, an intertie with the City of Long Beach may eventually be feasible. However, both adjacent systems currently chlorinate their water and NBWD does not.

Water Main Replacement Program

Life expectancy of distribution mains can vary significantly depending on the water main materials used, local soil conditions, and the construction practices used during water main installation. For planning purposes, it is estimated that the average life expectancy of the NBWD water mains is approximately 50 to 75 years. Water mains are generally the most expensive part of a water system. Water main replacement costs in 2014 dollars can be expected to range from approximately $0.5 to $1.0 million per mile of water main. Factors that influence the cost of water main installation include size of the water main, the soil characteristics where the water main is to be installed, groundwater conditions at the water main installation location, number of services, hydrants and other appurtenances to be installed with the water main, existing utilities in the vicinity of the water main construction, traffic control requirements, and surface restoration requirements in the water main construction area.

Table 1-5 indicates that the system has approximately 56.14 miles of water main. At $0.5 to $1.0 million per mile for water main replacement, replacement of the entire distribution system could be expected to cost between $28 and $56 million. Since most of the NBWD water mains were installed over a time span of several years, the mains can

also be expected to require replacement over a similar time span. Water facilities replacement cycles can lead to a financial "echo effect," in which replacement costs come back on the water system in waves as the various system components reach the end of their useful life. It is therefore wise to schedule replacement of facilities over an extended period to avoid having a wave of water facilities replacements hit the system at once.

It is recommended that NBWD institute a progressive facilities replacement program. In a progressive distribution main replacement program, NBWD would replace the water system's mains on a continuing basis, such that the mains will be replaced on a time schedule that matches their life expectancy and actual conditions. NBWD will consider implementing a progressive water distribution main replacement program to avoid having to do extensive water main replacement over a relatively short time period.

To replace the entire distribution system over a 50-year time period, an average of 1/50th of the system would be replaced annually. This would represent approximately 1.12 mile of water main replacement per year at an average estimated annual cost of approximately $560,000 to $1,120,000 per year in 2014 dollars. Water main replacement will be prioritized based on experience regarding the areas of the system that have the most problems with existing water mains, both in terms of water main failures and in terms of water main capacity.

Water Service Metering

The NBWD water system is fully metered. However, as discussed in Chapter 2, many of the meters, both service meters and source meters, are old and in need of replacement. The life expectancy of most water service meters is generally thought to be ten to twenty years. Based on the current 2,686 water service connections, to replace all water meters on a ten year cycle would require replacing an average of 269 meters per year, or five to six new water meters per week. A twenty-year meter replacement cycle would require replacing an average of 134 meters per year, or two to three meters per week. Note that in Chapter 2 under the heading Distribution System Leakage, it is stated that NBWD is currently replacing approximately 350 water service meters per year, intends to have all water meters replaced by 2017, and plans to initiate a ten-year replacement cycle after that.

Long-Term Fire Flow Capacity Goal

As stated in Table 3-1, WAC 246-293-640 requires water systems with 1,000 or more water service connections to provide fire flow capacity of 500 gpm sustainable for 30 minutes in residential areas and 750 gpm sustainable for 60 minutes in commercial and multi-family areas, and to have a maximum fire hydrant spacing of one every 900 feet. NBWD has the storage and pumping capacity to meet this standard, but the existing distribution system will need significant improvements to support fire hydrants every 900 feet.

Hydraulic Capacity Analysis – Modeling

The development of a computer hydraulic model, which can accurately and realistically simulate the performance of a water system in response to a variety of conditions and scenarios, has become an increasingly important element in the planning, design, and analysis of municipal water systems. The Washington State Department of Health's WAC 246-290 requires hydraulic modeling as a component of water system plans.

Hydraulic Modeling Software

The NBWD water system has been analyzed using MWHSoft's H2ONet hydraulic modeling software, which operates in an AutoCAD computer-aided design and drafting environment. The H2ONet model was created from the NBWD water system base map.

The H2ONet model is configured with a graphical user interface. All water system elements, including pipes, control valves, pumps, and reservoirs were assigned a unique graphical representation within the model. Each element was assigned a number of attributes specific to its function in the actual water system. Typical element attributes include spatial coordinates, elevation, water demand, pipe lengths and diameters, pipe friction coefficients and critical water levels for reservoirs. With attributes of each system element as the model input, the H2ONet software produces the model output in the form of flows and pressures throughout the simulated water system.

Model Assumptions

Prior to the calibration of the hydraulic model, the basic layout of the water system was recreated within the model. The lengths, diameters, and connection points of system piping are assigned using an updated base map of the water system. The locations of the wells and reservoirs were found on water system base maps, while the critical elevations of the reservoirs and the booster pump station were taken from previous reports, as-built information, and satellite imagery. A map of the water system model including node identifications is included in Appendix F. Results of hydraulic modeling are also included in Appendix F. The assumptions regarding the modeling of all sources of supply and system demands are included in the following sections.

Well Pumps

The District's well sources were not included in the hydraulic model since they do not discharge directly into the distribution system. Only infrastructure in direct connection to the distribution system has been included in the hydraulic model.

Treatment System

The District's treatment systems were not included in the hydraulic model since they do not discharge directly into the distribution system. Only infrastructure in direct connection to the distribution system has been included in the hydraulic model.

Storage Reservoirs

The storage reservoirs located at both the north and south wellfields were modeled as fixed head reservoirs with head equal to the elevation of the water surface inside the tank with the appropriate storage components removed.

Booster Pumps

The booster pumps were manually controlled on/off to meet the modeled system demands. Actual pump curves were used to simulate realistic outputs based on downstream pressures. The north wellfield booster pump station discharges through a pressure sustaining/reducing valve into the distribution system. Within the hydraulic model, the downstream pressure for this PRV was set at 60 psi. The jockey pumps at the south wellfield booster pump station are operated with a variable frequency drive. Pump speed is changed to increase or decrease discharge pressure into the distribution system to maintain a pressure setpoint of approximately 60 psi. This functionality was recreated within the hydraulic model by simulating a pressure reducing valve (set at 60 psi) at the discharge of the south wellfield booster pump station.

System Demands

A key element in the hydraulic modeling process is the distribution of demands throughout the water system. Total demand on the system is based on the projected demands from Table 2-11, Projected Water System Demands. Existing and future demands were distributed based on the location of existing water service connections. Nine demand sets were used in the hydraulic analysis.

Calibration Demands: These demands were used while calibrating the model and were derived from source meter records obtained from the District for August 21st, the day that hydrant testing was performed.

2015 Maximum Day Demands: These demands were used to evaluate the existing system's ability to provide fire flow during the 2015 maximum day demand at the DOH minimum residual pressure requirement of 20 psi.

2015 Peak Hour Demands: These demands were used to verify the system is able to meet the DOH standards to supply domestic water at a minimum system wide pressure of 30 psi.

2021 Maximum Day Demands: These demands were used to evaluate the system's ability to provide fire flow during the projected 2021 maximum day demand at the DOH minimum residual pressure requirement of 20 psi with the 6-year Capital Improvement Plan implemented.

2021 Peak Hour Demands: These demands were used to verify the system is able to meet the DOH standards to supply domestic water at a minimum system wide pressure of 30 psi with the 6-year Capital Improvement Plan implemented.

2035 Maximum Day Demands: These demands were used to evaluate the system's ability to provide fire flow during the projected 2035 maximum day demand at the DOH minimum residual pressure requirement of 20 psi with the 20-year Capital Improvement Plan implemented.

2035 Peak Hour Demands: These demands were used to verify the system is able to meet the DOH standards to supply domestic water at a minimum system wide pressure of 30 psi with the 20-year Capital Improvement Plan implemented.

Model Calibration

The calibration of a hydraulic model provides a measure of assurance that the model is an accurate and realistic representation of the actual system. The hydraulic model of the NBWD water system was calibrated using data obtained from fire hydrant tests at various locations throughout the water system. Fire hydrant tests were conducted and recorded throughout the system on August 21, 2014. During these tests, static and residual pressures were recorded as staff opened hydrants and recorded the flow rate. Field results were used to calibrate the hydraulic model through verification and adjustment of pipe type, sizes, roughness coefficients, and elevations.

Seven locations throughout the distribution system were chosen to perform hydrant testing. The locations were chosen to provide flow and pressure data at the extremities of the distribution system. A description of each testing location is presented in Table 3-11.

TABLE 3-11

Hydrant Testing Locations

Test Number	Hydrant Number and Location	Pressure Reading Location
1	J814, Intesection of Moehead Road and Sandridge Road	J794, Intersection of 272nd Place and Sandridge Road
2	J692, West end of 280th Place	J688, Intersection of 280th Place and "L" Place
3	J1680, Intersection of 256th Place and Ridge Avenue	J472, Intersection of 280th Place and SR 103
4	J328, Approximately 300 feet west of SR 103 on 242nd Place	J326, Intersection of 242nd Place and SR 103
5	FH-1, Approximately 700 feet west of SR 103 on 197th Street	FH-2, Intersection of 200th Lane and SR 103
6	J952, Intersection of 240th Place and Birch Place	J1716, Along Birch Place, between 235th Lane and 240th Place
7	J1480, Intersection of Birch Lane and 205th Street	J1670, Along Birch Place, approximately 600 feet north of the intersection with 212th Place

Reservoir water levels and booster pump operating status was recorded during testing. A summary of the recorded reservoir levels and hydrant flow rates is presented in Table 3-12. The system conditions at the time of testing were replicated in the hydraulic model during the calibration process.

TABLE 3-12

System Conditions During Hydrant Tests

Test No.	Pumps Running	Reservoir Level, feet	Static Pressure, psi	Residual Pressure, psi	Pitot Pressure, psi	Flow, gpm
1	N-1, N-2, N-4, N-5, S-1, S-2, S-3, S-4	NWF ~ 31' SWF ~ 40'	58	50	36	1,007
2	N-1, N-2, N-4, N-5, S-1, S-2,	NWF ~ 31' SWF ~ 40'	55	32	10	531
3	N-1, N-2, N-4, N-5, S-1, S-2, S-3, S-4	NWF ~ 31' SWF ~ 40'	52	49	44	1,113
4	N-1, N-2, N-4, N-5, S-1, S-2, S-3, S-4	NWF ~ 31' SWF ~ 40'	52	32	20	750
5	N-1, N-2, N-4, N-5, S-1, S-2, S-3, S-4	NWF ~ 31' SWF ~ 40'	49	20	9	501
6	N-1, N-2, N-4, N-5, S-1, S-2, S-3, S-4	NWF ~ 31' SWF ~ 40'	50	18	18	712
7	N-1, N-2, N-4, N-5, S-1, S-2, S-3, S-4	NWF ~ 31' SWF ~ 40'	54	29	4	336

Using the system conditions for each hydrant test, the hydraulic model was used to generate static pressure and residual pressure at the measured hydrant flow rate. The total system demand at the time of the hydrant tests was based on production data from the booster pump stations for the day of the tests. Model output was generated at points in the model equivalent to the locations of the hydrant tests.

Model output for static pressure was generated by running the model with demands based on the booster pump station output during the tests. Model output for residual pressure was generated at each hydrant test location by placing an added demand equal to the measured hydrant flow rate and recording the resulting pressure.

The system pressures and pipe flow rates determined in the hydraulic analysis are highly dependent on the friction loss characteristics established for each pipe. The friction losses occurring in lengths of pipe and various valves are accounted for in the hydraulic model. The friction factors for the pipes in the modeled system are adjusted throughout the calibration process until the model output best approximates the measured values. Hazen-Williams C-factors between 100 and 130 were used throughout the system. The friction factors for the pipes also compensate for system pressure losses through valves and pipe fittings.

The model output was produced for two data comparisons, static pressure and hydrant flow residual pressure. The values measured in the hydrant flow tests are compared to the model output values in Table 3-13.

TABLE 3-13

Calibration Results

Test No.	Flow (gpm)	Static Pressure (psi)			Residual Pressure (psi)		
		Field	Model	Difference	Field	Model	Difference
1	1,007	58	58	-0.1	50	49	-0.8
2	531	55	53	-1.7	32	33	0.8
3	1,113	52	53	1.2	49	52	2.7
4	750	52	55	2.7	32	36	4.3
5	501	49	50	1.5	20	19	-1.2
6	712	50	51	1.5	18	20	2.4
7	336	54	53	-0.8	29	27	-2.2

Hydraulic models are required to be within 5 psi of measured pressure readings for long-range planning, according to the DOH Water System Design Manual, Table 8-1. Calibration of the hydraulic model produced results that are within 5 psi of actual field test data for static pressure and residual pressure. No calibration results were outside the 5-psi guidelines from the Water System Design Manual.

Model Input

Model input assumptions have significant impacts on peak hour and fire flow results. Table 3-14 provides the booster pump status modeled for each scenario.

During peak hour scenarios, operational and equalizing storage is removed from all reservoirs. During fire flow scenarios, operational, equalizing, and fire suppression storage is removed from all reservoirs.

TABLE 3-14

Booster Pump Status During Model Scenarios

Pump	Capacity	2015		2021		2035	
		PHD	Fire Flow	PHD	Fire Flow	PHD	Fire Flow
N-1	109	ON	ON	ON	ON	ON	ON
N-2	120	ON	ON	ON	ON	ON	ON
N-3	280	ON	ON	ON	ON	ON	ON
N-4	500	OFF	ON	OFF	ON	OFF	ON
N-5	500	OFF	OFF	OFF	OFF	OFF	OFF
N-6	120	ON	ON	ON	ON	ON	ON
N-7	120	ON	ON	ON	ON	ON	ON
N-8	120	ON	ON	ON	ON	ON	ON
S-1	175	ON	ON	ON	ON	ON	ON
S-2	175	ON	ON	ON	ON	ON	ON
S-3	750	OFF	ON	OFF	ON	OFF	ON
S-4	750	OFF	ON	OFF	ON	OFF	ON

Peak Hour Demand Modeling Results

Pursuant to WAC 246-290-230 (5), a water system must maintain a minimum pressure of 30 psi in the distribution system under peak hour demand conditions. The existing distribution system has been modeled under 2015, 2021 and 2035 peak hour demand conditions and the minimum pressures are provided in Table 3-15. Results for all model nodes are included in Appendix F. A color coded map showing system pressures under 2015 peak hour demand conditions is also included in Appendix F.

TABLE 3-15

Lowest System Pressures During Peak Hour Demand Conditions (1)

Scenario	Pressure and Location
2015 Peak Hour Demand	35 psi at the terminus of Ash Lane (J1282)
2021 Peak Hour Demand(2)	39 psi at the east end of 195th Street (J30)
2035 Peak Hour Demand(2)	39 psi at the east end of 195th Street (J30)

(1) The system was modeled with operating and equalizing storage removed from the reservoirs and pumps operating according to Table 3-14.

(2) Includes construction of Project D-1, a booster pump station serving Birch Place, south of 227th Street.

As shown in Table 3-15, pressures in the distribution system are predicted by the model to be at or above the minimum 30-psi requirement under peak hour demand. However, the District has received complaints related to low pressure at the southern end of Birch

Place. The minimum system pressures listed for 2021 and 2035 account for construction of a booster pump station serving Birch Place south of 227th Street. This booster pump station is required to meet fire flow requirements at the south end of Birch Place.

Fire Flow Modeling Results

Pursuant to WAC 246-290-230 (6) a water system must be designed to provide adequate fire flow under maximum day demand conditions, while maintaining a minimum system pressure of 20 psi. While these conditions can be met throughout most of the system, the model predicts that certain locations are not able meet this fire flow standard. **Table 3-16 provides a list of fire flow deficiencies in the system.** The "Projects" column refers to projects discussed below to improve fire flows. Since maximum day demand in 2021 and 2035 are projected to be less than in 2015, 2015 maximum day demand conditions represent the critical design scenario. Therefore, no deficiencies are listed for either the 2021 or 2035 demand conditions.

TABLE 3-16

Fire Flow Deficiencies During 2015 Maximum Day Demand Conditions

Hydrant	Location	Elevation (ft)	Required Fire Flow (gpm)	Available Fire Flow (gpm)	Project or Remedy	Available Fire Flow after Project (gpm)
J1480	Intersection of 205th Street and Birch Place	26	500	209	Project P-1	558
J1482	Southern terminus of Birch Lane	24	500	209	Project P-1	572
J1670	Birch Lane, approximately 600 feet north of the intersection with 212th Place	27	500	283	Deregulate booster station discharge at south wellfield booster station(1)	762
J16	Intersection of SR-103 and 178th Place	27	500	355	Deregulate booster station discharge at south wellfield booster station(1)	594
FH-1	197th Street, 700 feet west of SR 103	29	500	356	Deregulate booster station discharge at south wellfield booster station(1)	592
FH-2	Intersection of SR 103 and 200th Lane	34	500	400	Deregulate booster station discharge at south wellfield booster station(1)	672
J144	Along SR 103, approximately 170 feet north of the intersection with 205th Lane	30	500	425	Deregulate booster station discharge at south wellfield booster station(1)	710

TABLE 3-16 – (continued)

Fire Flow Deficiencies During 2015 Maximum Day Demand Conditions

Hydrant	Location	Elevation (ft)	Required Fire Flow (gpm)	Available Fire Flow (gpm)	Project or Remedy	Available Fire Flow after Project (gpm)
J162	Intersection of SR 103 and 212th Place	33	500	461	Deregulate booster station discharge at south wellfield booster station(1)	764
J242	Terminus of 205th Street	27	500	488	Deregulate booster station discharge at south wellfield booster station(1)	780
J1158	Approximately 250 feet west of the intersection of U Street and 229th Street	27	500	489	Deregulate booster station discharge at south wellfield booster station(1)	775
J190	Intersection of SR 103 and 217th Lane East	33	500	498	Deregulate booster station discharge at south wellfield booster station(1)	819
J192	Approximately 350 feet east of the intersection of SR 103 and 217th Lane East	25	500	498	Deregulate booster station discharge at south wellfield booster station(1)	819
J194	Approximately 700 feet south of 217th Lane East, 350 feet east of SR 103	25	500	498	Deregulate booster station discharge at south wellfield booster station(1)	819

(1) Deregulation of the South Well Field booster pump station will allow the pumps to provide pressure to the distribution system without restraint from a pressure reducing valve.

A color coded map showing available fire flow throughout the distribution system under 2015 and 2021 maximum day demand conditions is included in Appendix F. The available fire flow map corresponding to 2021 maximum day demand conditions includes the operational changes and capital projects identified in Table 3-16. An available fire flow map is not provided for the 2035 maximum day demand scenario since maximum day demand is projected to be less in 2035 than in 2021. Therefore, available fire flow under 2035 maximum day demand conditions will be greater than available fire flow under 2021 maximum day demand conditions.

Distribution Improvements

Various water system improvements were modeled to determine the optimal improvements to alleviate the identified fire flow deficiencies. The following water system improvement was determined to be the most effective option to meet the fire flow

requirements. The project listed in Table 3-16 corresponds to the project listed below. This project is discussed in further detail in Chapter 8, Capital Improvement Plan.

> **Project P-1:** Construct a booster pump station at the intersection of 227th Street and Birch Place to serve connections along Birch Street south of 227th Street. For the purposes of this analysis, it has been assumed that the jockey and fire pumps have been sized identically to the south wellfield booster station. The jockey pump has been modeled as discharging through a pressure reducing valve set at a downstream pressure of 60 psi while the fire pump discharges directly into the distribution system.

Fire flow and peak hour node reports and node maps are available in Appendix F.

WATER SYSTEM CAPACITY LIMITS

There are several factors that could limit water system capacity, including source capacity, storage capacity, booster pump capacity, annual water rights and instantaneous water rights capacity.

SOURCE CAPACITY LIMIT

As a planning goal, source capacity should be capable of meeting maximum day demand in 18 hours per day of pumping. From Table 1-4, total installed source capacity is 915 gpm. The installed source capacity limit can be calculated as follows:

$$\text{Source Capacity Connections Limit} = \frac{915 \text{ gpm} \times 1{,}080 \text{ min/day}}{278 \text{ gpd per ERU}} = 3{,}554 \text{ ERUs}$$

Existing source capacity is adequate for up to 3,554 ERUs.

INSTANTANEOUS WATER RIGHT CAPACITY LIMIT

From Table 1-2, NBWD has 1,100 gpm of instantaneous water rights. Assuming that use of these rights would also be limited to 18 hours per day, the instantaneous water rights limit can be calculated as follows:

$$\text{Instantaneous Water Rights Connections Limit} = \frac{1{,}100 \text{ gpm} \times 1{,}080 \text{ min/day}}{278 \text{ gpd per ERU}} = 4{,}273 \text{ ERUs}$$

Existing instantaneous water rights are adequate for up to 4,273 ERUs.

ANNUAL WATER RIGHT CAPACITY LIMIT

The annual water rights limit from Table 1-2 is 696 ac-ft/yr and the Average Day Demand per ERU from Table 3-1 is 114 gpd. The limit on ERUs due to the annual water right limit can be calculated as follows:

$$\text{Annual Water Rights Connections Limit} = \frac{696 \text{ ac-ft/yr} \times 325{,}851 \text{ gal/ac-ft}}{365 \text{ days/year} \times 114 \text{ gpd/per ERU}} = 5{,}450 \text{ ERUs}$$

Existing annual water rights are adequate for up to ERUs.

BOOSTER PUMP SYSTEM CAPACITY LIMIT

As discussed above, under the heading *Booster Pump System*, the installed booster pump capacity will meet projected peak hour demands and maximum day demand plus fire flow throughout the 20-year planning horizon, as well as projected buildout demands, with any one pump out of service. The system capacity limit based on installed booster pump capacity and PHD can be estimated by solving the PHD equation for the number of ERUs and setting PHD equal to the installed pumping capacity. The formula for PHD from Table 3-1 is as follows:

$$PHD = 0.309*N+61$$

Solving for the number of ERUs, N, yields the following:

$$N= \frac{PHD - 61}{0.309}$$

Inserting the installed pump capacity of 2,969 gpm with one pump out of service, from Table 1-4, for PHD yields the following:

$$N = \frac{2{,}969 - 61}{0.309} = 9{,}411 \text{ ERUs}$$

Existing booster pump capacity is adequate for up to 9,411 ERUs based on meeting PHD.

The system capacity limit based on the booster pump system meeting maximum day demand plus fire flow also needs to be evaluated. The Maximum Day Demand plus fire flow is expressed as follows:

$$Q = \frac{MDD * N}{1{,}440 \text{ minutes per day}} + FF$$

Solving this for N yields the following:

$$N = \frac{Q - FF}{MDD} * 1{,}440 \text{ Minutes per Day}$$

Inserting the installed pump capacity of 3,169 gpm with one pump out of service, from Table 1-4, fire flow of 750 gpm and MDD of 278 gpd per ERU yields the following:

$$N = \frac{2{,}969 - 750}{278} * 1440 = 11{,}494 \text{ ERUs}$$

Since the limit on existing booster pump capacity based on meeting PHD is more restrictive than the limit based on meeting MDD plus fire flow, the ERU limit based on booster pump capacity is 9,411 ERUs.

However, it should be noted that additional capacity limits exist on account of the distribution system. As demands increase with additional connections, distribution system losses will increase, providing pressure limitations to further connections.

STORAGE CAPACITY LIMIT

Table 3-10 projects that installed storage capacity will not become a limiting factor through the twenty-year planning horizon. To find the number of ERUs supportable by existing storage it is necessary to calculate storage requirements for various numbers of ERUs until the required storage exceeds the existing effective storage. Table 3-17 shows storage requirements for 2,884 ERUs and for 2,885 ERUs. The existing effective storage capacity is adequate for 2,884 ERUs, but it is 234 gallons deficient for 2,885 ERUs. Therefore, the existing storage capacity is adequate for up to 2,884 ERUs.

TABLE 3-17

Storage Requirement Limit

ERUs	Required Effective Storage, gallons				Existing Effective Storage, gallons[4]	Storage Surplus/ (Deficit), gallons
	Equalizing[1]	Standby[2]	Fire Suppression	Total[3]		
2,884	62,573	576,800	45,000	639,373	639,386	13
2,885	62,620	577,000	45,000	639,620	639,386	(234)

(1) Equalizing storage is peak hour demand based on the PHD formula developed in Chapter 2 and shown in Table 3-1, minus the existing source capacity of 915 gpm, times 150 minutes.

(2) Standby storage is two days of average day demand from Table 2-9, minus 18 hours of pumping at the existing source capacity of 780 gpm with the largest source out of service, or it is 200 gallons times the projected number of ERUs, whichever is greater.

(3) Total recommended storage is the sum of equalizing, plus the greater of either standby or fire suppression storage.

(4) Effective storage capacity is from Table 3-9.

The water system capacity limits derived above are summarized in Table 3-18. The most limiting factor is storage capacity, based on DOH Design Manual criteria, and limits the system to 2,884 ERUs. This is an additional 193 ERUs above the 2,691 ERUs represented by 2013 water use data, as shown in Table 2-8. With additional storage capacity, the system could expand to the source capacity limit of 3,554 ERUs, or an additional 863 ERUs. With additional source capacity, the system could expand to the instantaneous water right capacity of 4,273 ERUs, or an additional 1,582 ERUs. (It should also be noted that additional source capacity will also reduce the storage capacity requirement.) With additional instantaneous water rights, the system could expand to the annual water rights capacity limit of 5,450 ERUs, or an additional 2,759 ERUs. With additional annual water rights, the system could expand to the Booster Pump Capacity limit of 9,411 ERUs based on meeting peak hour demand, or an additional 6,720 ERUs. With additional booster pump capacity the system could expand beyond 9,411 ERUs.

TABLE 3-18

Water System Capacity Limits

Limiting Factor	System Capacity, ERUs	2013 Demand, ERUs	Available ERUs
Storage Capacity	2,884	2,691	193
Source Capacity	3,554	2,691	863
Instantaneous Water Right Limit	4,273	2,691	1,582
Annual Water Right Limit	5,450	2,691	2,759
Booster Pump Capacity, PHD	9,411	2,691	6,720

SUMMARY OF SYSTEM NEEDS AND CONCERNS

From the foregoing discussions, the following are the identified water system deficiencies. No attempt is made here to prioritize the deficiencies. Improvements to correct identified system deficiencies will be prioritized in Chapter 8, Capital Improvements.

SOURCE

The system currently has adequate source capacity to meet projected system demand. However, as discussed in Chapter 1, Wells N-1 and N-2 lack adequate sanitary control area, and Well N-3 is difficult to treat due to an elevated level of manganese. These wells are also the systems' oldest wells and are nearing the end of their useful life. Well N-7 is experiencing significant reduction in yield. The N-7 well report shows the well is a 6-inch casing with a screened interval about ten feet higher than the rest of the wells in the North Wellfield. Its date of construction is not indicated on the well report. Wells S-1, S-2 and S-4 have lost capacity and have manganese levels making treatment

difficult. Wells N-1, N-2, N-3, S-1, S-2 and S-4 are all currently designated as emergency use only.

NBWD is in the process of developing new wells near the South Well Field. Three wells have been drilled and tested. The wells each tested in the neighborhood of 150 gpm, and do not have excessive iron or manganese. Preliminary tests indicate that treatment may be required for removal of arsenic and hydrogen sulfide. It is anticipated that design for these wells will be completed in 2014 and the wells will be put into service pending Ecology approval of additional points of withdrawal on the water right. Once these wells are in service, NBWD anticipates removing Wells N-1, N-2 and N-3. NBWD plans on drilling additional new wells in the North Wellfield in 2015 and 2016.

WATER TREATMENT

The current water treatment system is effectively removing iron, manganese and arsenic to below regulatory levels. However, NBWD is desires to reduce the operations cost of water treatment and simplify the treatment plant operation by using ambient air as an oxidant instead of ozone. Ozone production requires a significant amount of electrical energy and also contributes to corrosion of equipment in the water treatment building. The District commissioned Gray and Osborne, Inc. to conduct a pilot test described in Chapter 1 (page 1-12). As a result of the conclusions of the pilot test the District has discontinued using ozone as an oxidant in favor of ambient air.

WATER STORAGE

Existing water reservoirs are in good condition, and storage capacity is adequate for the 20-year planning horizon. However, the telemetry system associated with the reservoirs and wells needs improvement so that reservoir water levels can turn wells on and off, and so that water levels can be monitored from a central location.

CONTROL SYSTEM

The wells are currently operated manually because the control system to turn the wells on and off based on reservoir water level is not functioning. NBWD plans to replace the telemetry and control system in 2016.

WATER DISTRIBUTION SYSTEM

Based on a lack of water main breakage problems, the water distribution system is in generally acceptable condition. However, over half of the system is 2-inch water main and 65 percent is less than 6-inch water main. There are no fire hydrants on water mains less than 6 inches in diameter; however, fire hydrant distribution within the service area does not meet the minimum standard of 900-foot spacing called for in WAC 246-293-640. To meet the 900-foot spacing standard would require upgrading many water mains to 6 inch or larger.

There is also a significant amount of the water system that is not looped. Tying some of the dead-end lines together would improve system hydraulics and water circulation.

The system is fully metered, but many of the meters are old and may not be providing accurate data. NBWD is currently replacing approximately 350 water service meters per year, and anticipates having all water meters replaced by 2017. After that NBWD intends to replace water meters on a ten-year replacement cycle.

BOOSTER PUMP SYSTEM

The booster pump system is generally adequate to serve the projected 20-year peak hour and maximum day plus fire flow water system demands with one pump out of service. Also, since the system has two separate booster pump systems at two different locations, there is redundancy in the booster pump system that improves system reliability. However, there are some problems with coordination between the two booster pump systems. A central control system could help to better coordinate operations of the two booster pump systems.

BACKUP POWER SUPPLY

The existing backup power supplies for both Well Fields are adequate to power all facilities at the well field sites. However, if additional, higher capacity wells are to be developed for the South Well Field, additional backup power supply may also be needed at the South Well Field.

CHAPTER 4

WATER USE EFFICIENCY PROGRAM

OBJECTIVE

The objectives of this chapter are to identify the Water Use Efficiency (WUE) requirements pertaining to North Beach Water District, evaluate past conservation efforts, and describe NBWD WUE plan for the next 6 years.

WATER USE EFFICIENCY RULE

In 2003, the Municipal Water Supply - Efficiency Requirements Act (Municipal Water Law) was passed by the Washington State Legislature. This legislation amended RCW 90.46 to require additional conservation measures. The Municipal Water Law applies to all Municipal Water Suppliers, and defines all Group A community water systems as Municipal Water Suppliers. Among other things, the Municipal Water law directed DOH to develop the Water Use Efficiency Rule (WUE Rule), which was adopted in January 2007. NBWD is a Group A Community water supply under these laws and regulations, and as such is subject to the requirements of these rules and regulations. The following sections describe the requirements of these rules.

The WUE Rule consists of a series of amendments to existing sections, and addition of new sections, to WAC 246-290, the Group A Public Water System Regulations, and sets additional requirements for public water purveyors. The WUE Rule is comprised of four sections:

1. Planning requirements
3. Distribution leakage standard
2. Metering requirements
4. Goal setting and performance reporting requirements

These requirements of the WUE Rule are discussed in the following sections.

PLANNING REQUIREMENTS

The Planning Requirements of the WUE Rule include the following:

- Estimation of the amount of water saved through implementation of the system's WUE program over the past 6 years.
- Describe WUE Goals.
- Select WUE Measures.
- Evaluate selected WUE Measures to determine if they are cost effective.

- Implement WUE Measures that are determined to be cost effective.

These WUE Rule planning requirements are addressed in the following sections:

ESTIMATION OF WATER SAVED

From Figure 2-1 it can be seen that water production over the past 5 years has shown a general decreasing trend. This trend is also noticeable in Table 2-1. It should be noted that, during this period, the number of service connections was increasing, as shown in Figure 2-4. Figure 4-1 shows historic water use per full-time equivalent residential connection. Water use per connection over the data period has had an overall declining trend, as indicated by the negative slope of the water use trend line. The reduction in water use rate may be due to several influences, including water main leak repairs, improving control of reservoir overflows, construction of new homes with more water efficient fixtures, and regular promotion of water conservation by NBWD.

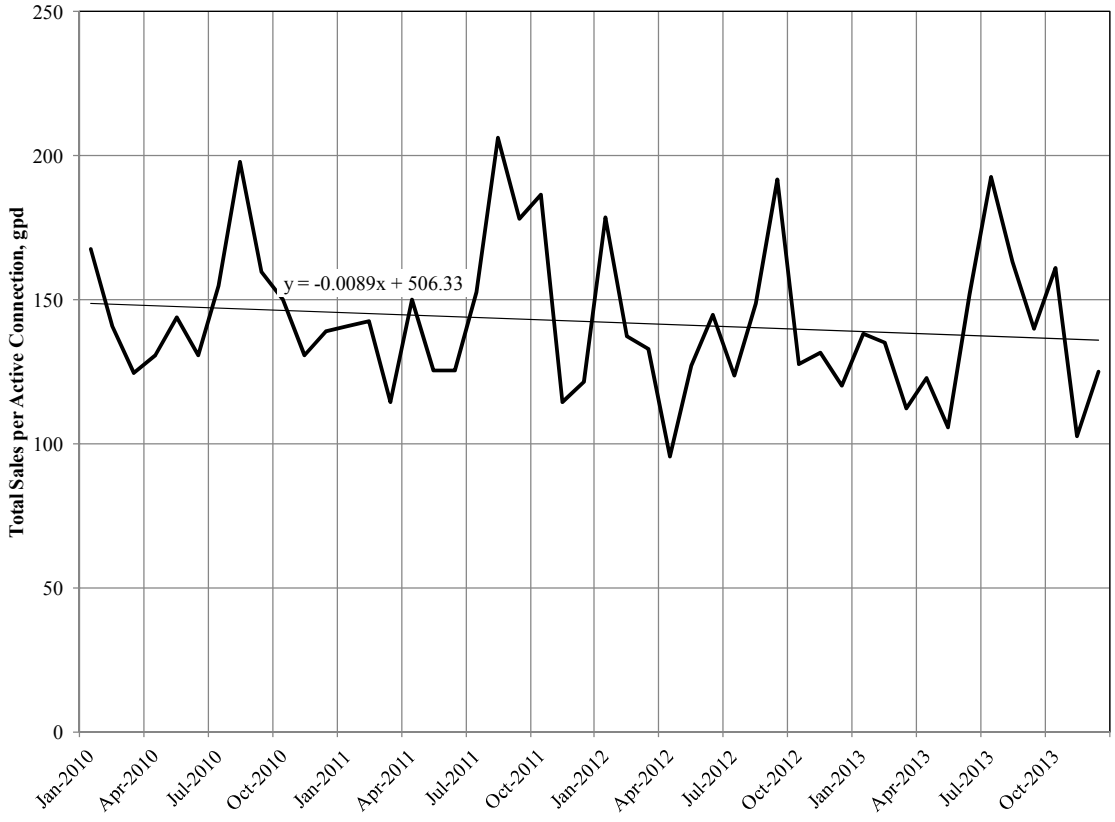


FIGURE 4-1

NBWD Past Water Sales Per Active Connection

The trend line formula in Figure 4-1 indicates a trend line slope of -0.0089 gpd per connection per day. That is, after one day the average reduction in usage rate was -0.0089 gpd per ERU, after two days it was 0.0178 gpd per ERU, after 3 days it was 0.0267 gpd per ERU, and so on. Over the data period this is a decline in water use rate of 13 gpd per ERU. Since the average water use rate reduction per ERU changed over time as did the number of ERUs, the savings on a day to day basis was calculated using a spreadsheet calculator and totaled for the data period. The total water savings over the 5-year period calculates to 16.16 million gallons. This is an average savings of 11,071 gallons per day over the data period.

WATER USE EFFICIENCY GOALS

The WUE Rule requires that the "governing body of the public water system shall establish water use efficiency goals within one year of the effective date of this rule." [WAC 246-290-830 (1)] The effective date of the rule was January 22, 2007. The WUE Rule further requires that water use efficiency goals must "be set in a public forum that provides opportunity for consumers and the public to participate and comment on the water use efficiency goals." [WAC 246-290-830 (4) (a)]

2008 Water use Efficiency Goals

NBPDA Board of Commissioners (predecessor to NBWD) adopted the following WUE Goal in a public meeting on September 15, 2008:

- Maintain Annual Customer Consumption at present levels.

2014 Water Use Efficiency Goals

Pursuant to WAC 246-290-830 (4), NBWD Board of Commissioners held a public hearing on March 16, 2015 where consumers and the public were provided an opportunity to participate and comment on The District's proposed WUE Goals. The Board adopted the following WUE Goals by Resolution 08-2015 in a public meeting on April 20, 2015:

- Maintain Distribution System Leakage (DSL), at no more than ten percent of net production.

- Reduce water usage per ERU by an average of one percent per year over the 6-year planning horizon.

As the water system continues to grow it is anticipated that water use efficiency will continue to improve. This is due to plans to replace and improve the water distribution system, improvements in water system control, plans to replace aging water source and service meters, and further measures to promote conservation. In addition, the uniform plumbing code has improved its conservation rules significantly since many of the homes

in the District's service area were constructed. As new homes are built and existing homes are remodeled the District will realize a decline in the average ERU value.

SELECTED WATER USE EFFICIENCY MEASURES

WAC 246-290-810 identifies the minimum number of water use efficiency measures that must be evaluated based on system size. NBWD serves between 2,500 and 9,999 customers and, therefore, must evaluate or implement a minimum of six water use efficiency measures. Certain WUE Measures are mandatory in the WUE Rule, and, therefore, may not be counted as meeting the minimum number of WUE Measures. These mandatory measures include the following:

- Install production (source) meters [WAC 246-290-496(1)].
- Install consumption (service) meters [WAC 246-290-496(2)].
- Perform meter calibration [WAC 246-290-496(3)].
- Implement a water loss control action plan to control leakage [WAC 246-290-820(4)].
- Educate customers about how they can use water efficiently at least once per year [WAC 246-290-810(4)(f)].

In addition, the WUE Guidebook states that any WUE measure implemented across multiple customer classes counts as one measure for each customer class to which it is applied. WUE Measures chosen by NBWD are listed in the following sections based on the WUE goals they are intended to help achieve.

Distribution System Leakage Reduction

- NBWD will replace problem water mains, and find and repair leaks.
- NBWD will replace old water meters on a ten-year water meter replacement cycle.
- NBWD will continue to improve its record keeping of unmetered water use, including water main flushing, construction water use, and fire hydrant use.
- NBWD will improve their reservoir water level control system to reduce reservoir overflow events.

Reduce Water Usage by 1 Percent per Year

- NBWD will promote water use efficiency by distribution of water meter reading records that show consumptive history, so that customers can see how successful they are in reducing their water usage and how they compare to other users.

- NBWD will notify customers who, based on water system meter reading data, appear to possibly have a leak on their side of the water service meter.

- NBWD will provide technical assistance in finding and repairing leaks to customers who suspect that they may have a leak on their side of the water service meter.

Minimum Required Number of Measures

The first two measures listed under Distribution System Leakage Reduction fall under the mandatory measures *"Implement a water loss control action plan"* and *"Perform meter calibration."* The second two measures are not included in the mandatory measures, and, therefore, can be counted as measures to meet the required minimum of six WUE Measures. None of the three measures listed under Reduce Water Usage by One Percent per Year are included in the mandatory measures, and, therefore, may all be counted toward meeting the minimum number of WUE measures. NBWD has two customer classes, residential and commercial. Each of these three measures will be applied to both of the NBWD customer classes. Therefore, these three measures, when applied to the two customer classes, count as six measures in satisfying the minimum number of measures to be implemented under 246-290-810. This makes a total of eight WUE measures, which exceeds the minimum requirement of six WUE measures that must be implemented.

EVALUATION OF WUE MEASURES

The WUE Rule, WAC 246-290-810 (4) (d) (iv) requires that WUE Measures must be implemented or evaluated based on specified criteria. Since the required number of measures has been selected for implementation, they need not be evaluated.

IMPLEMENT WUE MEASURES

The WUE Measures listed above are included in the NBWD Capital Improvement Program, Chapter 8, and in the NBWD Financial Plan, Chapter 9, of this Plan.

DISTRIBUTION SYSTEM LEAKAGE STANDARD

The WUE Rule sets a DSL standard of less than ten percent of finished water production. DSL is defined as the sum of all water metered into the distribution system over a given time period, less the sum of all metered water uses, and known or credibly estimated unmetered uses, out of the distribution system over the same time period. Known or credibly estimated unmetered uses may include uses such as construction, street sweeping, fire fighting, and water main flushing. DSL for NBWD, as shown in Table 2-6, has ranged from 14.9 percent in 2010 to 19.4 percent in 2013. Water utilities

that exceed the DSL standard of 10 percent must develop a Water Loss Control Action Plan (WLCAP).

WATER LOSS CONTROL ACTION PLAN

The WUE Guidebook states that water utilities that have between ten percent and twenty percent DSL must (1) Assess data accuracy; and (2) Assess data collection methods and errors. These two items are inter-related and will, therefore, be evaluated together.

Assess Data Accuracy, Collections Methods and Errors

In preparing the water production and sales data for Chapter 2 of this Plan, it was apparent that NBWD's system for obtaining and retaining water sales records has some problems. Data files included significant amounts of data that were not directly related to water meter read data and required a significant effort to extract actual metered water sales data from other extraneous data. Relevant water sales data included water meter read data as well as meter read corrections data. Where it was clear that meter corrections applied to specific meter reads, corrections were made to the water sales data. Where there were corrections that did not seem to apply to any given meter read, the corrections were ignored or a judgment was made as to how to apply the corrections. Some meter read data that did not have corrections was so far out of range that it was corrected anyway to be more in line with average usage for the billing period even though there was no correction indicated.

There are several factors that have contributed to these data deficiencies. First, the entire system has recently gone through ownership transitions. The system was previously two systems, each with its own billing system, and these systems were merged, including their water sales data. Second, the staff managing the billing system has changed as the system ownership transitioned. Therefore, the methods of notating water sales corrections has also changed, and some of the institutional knowledge of how the data was stored has been lost. Third, the billing system is old and is oriented around tracking finances more so than around tracking water volumes.

NBWD is installing a new automatic meter reading (AMR) system which will include new water billing software. It is anticipated that the new AMR system and new billing software will greatly improve water sales accounting. It is expected that the new billing system will be operational by the end of 2015.

Other DSL Factors

One factor that has contributed to DSL has been reservoir overflows. The control system, which is intended to turn the wells on and off with reservoir level, has not been operating correctly. Therefore, for the past several years the system has been operated manually. Wells have been turned on and left on for a time period, then turned off manually. At times when the operator has gone to the well site to turn the wells off, it was discovered

that the reservoir was overflowing. It is not known how much water was overflowed from the reservoirs due to this problem, but it is anticipated that replacing the reservoir control system will be a significant step toward reducing DSL. NBWD plans to replace the reservoir level control system, as well as other aspects of system control, in 2015.

METERING REQUIREMENTS

WAC 246-290-496(2)(c) requires all customer service connections be metered by ten years from the effective date of the WUE Rule. The effective date of the WUE Rule was January 22, 2007. Therefore, service meter installation must be completed by January 22, 2017. NBWD currently meters all sources and all water services. Therefore, NBWD is in compliance with the metering requirements of the WUE Rule.

GOAL SETTING AND PERFORMANCE REPORTING

Pursuant to the WUE Rule, NBWD must set WUE Goals and report progress annually. NBWD's WUE Goals have been addressed in preceding sections of this chapter. The annual report must include the following:

- Total source production
- DSL in percentage and volume
- Goal description, schedule, and progress toward meeting goals

The WUE Rule requires that water conservation goals must include a measurable outcome, address water supply or demand characteristics, and include an implementation schedule. The goal setting process must be held through a public forum and be reevaluated every 6 years. The first WUE Goals were required by July 2007 for all municipal water suppliers. Annual reports must be available to the public and submitted to customers and DOH by July 1 each year.

NBWD has adopted WUE Goals for this updated Water System Plan, as described in a previous section of this chapter. The NBWD Board has fully reviewed the WUE Goals contained in this Plan, and has provided opportunity for public review, comment and input. These goals and will be adopted in a public forum as part of this Plan pending DOH approval.

WATER USE DATA REPORTING

The *WUE Guidebook* identifies several categories of water use data that must be collected and recorded. This data is needed to meet the planning and performance reporting requirements and check compliance with the DSL standard of the WUE Rule. Table 4-1 summarizes the water use data collection requirements.

TABLE 4-1

Summary of Water Use Data Collection

Data Type	Unit of Measure	Collection Frequency	Comments
Water Service Connections	Number	Annual	Track by customer class.
Source of Supply Meter Readings	Gallons	Daily	Production data is collected at the wells daily and reported to DOH on an annual basis.
Import/Export from Emergency Interties	N/A	N/A	NBWD has no interties.
Wholesale Water Sold	N/A	N/A	NBWD has no wholesale customers.
Wholesale Water Purchased	N/A	N/A	NBWD has no wholesale source.
Maximum Day	Gallons	Monthly	Maximum day is determined monthly from source of supply meter readings.
Maximum Month	Gallons	Annual	Maximum month is determined annually from the monthly production reports.
Accounted for Water	Gallons	Monthly	The sum of metered water sales, known unmetered water use (e.g., filling a 5,000-gallon water truck), and estimated unmetered water use (e.g., main flushing).
Distribution System Leakage	Gallons and Percent of Production	Monthly	The difference between monthly production and monthly accounted-for water.
Residential Service Meter Readings	Gallons	Monthly	Total water use by customer class for each billing period.
Commercial Service Meter Readings	Gallons	Monthly	
Population Served	Number of People	Update Annually	Service area population estimated from active connections at 2.5 people per connection.
Economic Data	$	Annual	Review high, low and average water bills and assure adequate utility revenues.
Conservation Data	Gallons per capita per day	Annual	Track per-capita water use trends.

WUE PROGRAM DEVELOPMENT AND LEVEL OF IMPLEMENTATION

The following sections describe NBWD's WUE Program Development and Level of Implementation with resulting water use projections.

REGIONAL CONSERVATION PROGRAMS

The effects of a customer conservation program extend beyond the water service area. For example, Seattle Public Utilities heavily promoted water conservation to its customers in 2001 and communities throughout Puget Sound experienced a decrease in consumption. As the WUE Rule takes effect, neighboring water systems will likely increase their conservation efforts, thus increasing awareness of the need to conserve.

TARGET WATER SAVINGS PROJECTIONS

Table 4-2 provides the projected average day demand with and without meeting the WUE goal of reducing water usage per ERU by an average of 1 percent per year over the 6-year planning horizon. Projections include an average 3.1 percent water use for filter backwash. Based on the goal of reducing water usage per ERU, the 20-year projected water savings is 130.2 MG. This is an average water savings of 15,900 gallons per day over the 20-year period.

TABLE 4-2

Projected Total Production with WUE Measures

Year	ERUs[(1)]	Average Day Demand with WUE, gpd per ERU[(2)]	Annual Production with WUE, MG[(3)]	Annual Production without WUE, MG[(4)]	Annual Savings with WUE, MG[(5)]
2015	2,705	112.9	115.0	116.2	1.1
2016	2,712	111.7	114.1	116.5	2.3
2017	2,719	110.6	113.3	116.8	3.5
2018	2,726	109.5	112.4	117.1	4.6
2019	2,733	108.4	111.6	117.4	5.8
2020	2,740	107.3	110.7	117.7	6.9
2021	2,747	107.3	111.0	118.0	6.9
2022	2,755	107.3	111.4	118.3	7.0
2023	2,762	107.3	111.6	118.6	7.0
2024	2,769	107.3	111.9	118.9	7.0
2025	2,776	107.3	112.2	119.2	7.0
2026	2,783	107.3	112.5	119.5	7.0
2027	2,791	107.3	112.8	119.8	7.0
2028	2,798	107.3	113.1	120.1	7.1
2029	2,805	107.3	113.4	120.5	7.1
2030	2,812	107.3	113.7	120.8	7.1
2031	2,820	107.3	114.0	121.1	7.1

TABLE 4-2 – (continued)

Projected Total Production with WUE Measures

Year	ERUs[1]	Average Day Demand with WUE, gpd per ERU[2]	Annual Production with WUE, MG[3]	Annual Production without WUE, MG[4]	Annual Savings with WUE, MG[5]
2032	2,827	107.3	114.3	121.4	7.1
2033	2,834	107.3	114.5	121.7	7.2
2034	2,842	107.3	114.9	122.0	7.2
2035	2,849	107.3	115.1	122.3	7.2
Total 20-Year Savings					**130.2**

(1) Projected Total ERUs comes directly from Table 2-10.
(2) Average Day Demand (ADD) with WUE reduces from the value of 114 gpd per ERU, as shown in Table 2-9, by 1 percent per year for the first 6 years, then remains constant at 107.3 gpd per ERU thereafter.
(3) Annual Production with WUE is ERUs times ADD with WUE, times 365 days per year and divided by 1,000,000 gallons per MG, plus 3.1 percent of production used for filter backwash.
(4) Annual Production without WUE is ERUs times the ADD value of 114 gpd per ERU from Table 2-9, times 365 days per year and divided by 1,000,000 gallons per MG, plus 3.1 percent of production used for filter backwash.
(5) Annual Savings with WUE is the difference between Annual Production with WUE and Annual Production without WUE.

SOURCE OF SUPPLY ANALYSIS

OPTIMIZING USE OF CURRENT SUPPLIES

NBWD has increased the efficiency of its water system in the past ten years by finding and repairing water system leaks, and by promoting water conservation amongst NBWD members and customers. NBWD plans to continue these efforts to further optimize current water supply. NBWD may be able to delay the expenses of additional treatment capacity, additional storage capacity, and additional booster pump capacity by implementing water conservation measures.

ENHANCED CONSERVATION MEASURES

As technology for water leak detection and repair advances, and as more water efficient building fixtures and appliances become more standard, water conservation will be enhanced by implementation of standard building codes and replacement of aging fixtures and appliances with newer, more water efficient units.

WATER RIGHT CHANGES

Assuming no changes in water use efficiency, NBWD will have an excess annual water right capacity of 357 acre-ft/yr by the year 2035, as shown in Table 3-9. If the water use efficiency savings described in this chapter are realized, NBWD can increase its excess annual water right capacity to 387 acre-ft/yr at the end of the 20-year planning period.

ARTIFICIAL RECHARGE

At this time there are no plans for any kind of artificial recharge of the aquifers in the NBWD area. NBWD has no sewer system and has not had problems with their groundwater supply so there is no reason at this time to consider an artificial recharge program. However, as the area continues to develop, increasing impervious areas and storm water management enhancements, and, possibly, climate change could lead to future groundwater resource concerns. If, in the future, groundwater resources are impacted by development, aquifer recharge systems might be worthy of consideration at some future date.

WATER RECLAMATION

Pursuant to WAC 246-290-100(4)(f)(viii), water systems serving 1,000 or more total connections must provide an evaluation of opportunities for the use of reclaimed water, where they exist. The WUE Guidebook provides the following guidance regarding evaluation of water reclamation opportunities:

Water systems with 1,000 or more connections must collect information on reclaimed water opportunities and include that information in their planning documents (WAC 246-290-100(4)(f)(vii)). When evaluating opportunities for the use of reclaimed water, you should identify:

- Where reclaimed water could potentially be used, such as parks, golf courses, groundwater recharge facilities, and car washing facilities.
- Where reclaimed water production facilities exist and the locations of reclaimed water distribution lines (purple pipes).
- Any barriers to the use of reclaimed water, such as cost, permitting issues, water rights mitigation, and local regulations that govern the use of reclaimed water.
- Contractual obligations and agreements that limit the use of reclaimed water.
- Where reclaimed water is used or proposed within your water service area, provide a description and estimate usage.

- Your efforts to develop existing or new opportunities for the use of reclaimed water.

WHERE RECLAIMED WATER COULD POTENTIALLY BE USED

Prior to issuance of the WUE Guidebook, DOH published The Municipal Water Law Interim Planning Guidance. Attachment 9 from that guidance, *Water Reclamation Checklist for Systems with 1,000 or more Connections,* listed the following potential uses for reclaimed water to be given consideration:

Crop Irrigation	Trees, Sod, Nursery, Pasture, Irrigation of Food Crops
Landscape Irrigation	Cemeteries, Freeway Landscapes, Other Restricted Landscape Areas, Golf Courses, Parks, Playgrounds, Schoolyards, Other Open Access Areas, Residential Landscapes
Ponds	Landscape Impoundments, Recreational Impoundments
Water Trucks	Street Sweeping, Fire fighting and protection, Washing of Corporation Yards, Lots, and Sidewalks, Dust Control (Dampening Unpaved Roads, Other Surfaces), Dampening Soil for Compaction (Construction Sites, Landfills, Pipelines, etc.)
Other	Toilet and Urinal Flushing, Lift Stations, Ship Ballast, Fish Hatchery Basins, Washing Aggregate and Making Concrete, Flushing of Sanitary Sewers, Industrial Boiler Feed, Industrial Cooling, Industrial Process
Environmental Uses	Stream Flow Augmentation, Aquifer Recharge, Wetland Mitigation, Other
Other uses not listed above	Irrigation of bushes, shrubs, flowers; Security impoundments; Washing of parking lots; Washing show cattle; Artificial snow

Evaluation of Water Reclamation Opportunities

Neither NBWD nor any other entity has a municipal wastewater collection, treatment or disposal system serving the NBWD service area. Therefore, the only opportunities for wastewater reclamation would have to be by individual water users or by use of reclaimed wastewater from a neighboring area. The nearest community with a wastewater collection and treatment system is the City of Long Beach, located approximately nine miles south of NBWD.

WHERE RECLAIMED WATER PRODUCTION FACILITIES EXIST

The nearest wastewater treatment facility of any significant size is in the City of Long Beach, approximately nine miles to the south of NBWD. However, the City of Long Beach does not operate a wastewater reclamation facility.

BARRIERS TO USE OF RECLAIMED WATER

The primary barrier to implementation of water reclamation in the NBWD service area is cost. A sewer collection system, a wastewater reclamation facility, reclaimed water storage, pumping and distribution would all need to be constructed. Since NBWD is not in a urban growth area, construction of a sewer system may be inconsistent with some of the primary principles of the Growth Management Act. A much higher development density would be required to make a sewer system affordable. Both NBWD and Surfside HOA water system have plentiful water rights, so there is little incentive for water reclamation to augment water rights.

CONTRACTUAL OBLIGATIONS THAT LIMIT USE OF RECLAIMED WATER

There are no contractual obligations or agreements that we are aware of that would limit NBWD from using reclaimed water.

DESCRIPTION AND ESTIMATED USAGE

There are no plans for use of reclaimed water in the NBWD service area. Therefore, this is not applicable.

EFFORTS TO DEVELOP OPPORTUNITIES FOR THE USE OF RECLAIMED WATER

NBWD has not been making any efforts to develop use of reclaimed water in the NBWD service area. For reasons stated above, it is not considered reasonable or practical.

CONCLUSION

Due to lack of a central wastewater collection and treatment system, NBWD will not be pursuing a water reuse project at this time. If conditions change in the future, resulting in either an increase in benefit or reduction in cost of reuse, NBWD will reconsider reuse at that time.

CHAPTER 5

WELLHEAD PROTECTION PROGRAM

OVERVIEW

Water from underground aquifers, commonly referred to as groundwater, forms the primary source of drinking water for an estimated 65 percent of Washington state residents. NBWD relies on groundwater as its primary source. Groundwater is pumped from two wellfields designated the North Wellfield (NWF) and the South Wellfield (SWF). As shown in Table 1-3, the NWF consists of eight wells ranging in depth from 80 feet to 130 feet. The SWF currently consists of three wells ranging in depth from 56 feet to 121 feet. The new Wiegardt Wells 1, 2 and 3 have completed depths varying from 149 feet to 150 feet. Locations of the wellfields are shown in Figure 1-11 and in Figure 5-1.

To protect groundwater supplies, the Environmental Protection Agency (EPA) and the Department of Health (DOH) require public water utilities to develop a wellhead protection program as a component of their water system comprehensive plans. The purpose of a wellhead protection program is to provide local utilities with a pro-active program for preventing groundwater contamination. A successful wellhead protection program consists of a number of components which must be developed before the plan can be fully implemented. The major components of the plan are described below and form the basis of the following chapter.

- A *Susceptibility Assessment* determining the susceptibility to contamination.
- A *delineated Wellhead Protection Area* (WHPA), based on all reasonably available hydrogeologic information, including the Susceptibility Assessment.
- An *inventory* within each WHPA of potential sources of contamination.
- A *spill response plan* for each WHPA containing documentation for coordination with local first responders.
- *Contingency plans* for providing alternate sources of drinking water in the event that contamination does occur and management recommendations to reduce the likelihood that potential contaminant sources will pollute the drinking water supply.

SUSCEPTIBILITY ASSESSMENT

Separate susceptibility assessments have been completed for all of NBWD's wells. Copies of these susceptibility assessments are on file at DOH. Susceptibility assessments are an important initial step in selecting appropriate delineation methods to define the

WHPA boundaries. Drinking water supplies vary in their susceptibility to contaminants discharged at the surface. Wells that have been poorly constructed or have been improperly cased have an increased susceptibility. Additionally, wells located in an unconfined aquifer with no confining layer (layer of low permeability) between the aquifer and surface have a much higher susceptibility than those drawing water from confined aquifers deep below the ground surface.

After review of the susceptibility assessments, DOH has given all eight wells in the NWF, and South Well No. 2 "Moderate" susceptibility ratings. DOH has given South Well No. 1 and South Well No. 4 "High" susceptibility ratings. Susceptibility assessment forms have been completed for the Wiegardt wells and are included in Appendix C. Susceptibility ratings have not yet been assigned to these wells. It is anticipated that DOH will assign susceptibility ratings to these wells in the source approval process.

WHPA DELINEATIONS

The first step in developing a wellhead protection program is to establish the land areas around each well from which groundwater may be flowing to the well. These areas which most likely contribute pollutants to the groundwater are referred to as Zones of Contribution (ZOCs). The time-of-travel for a given ZOC is determined by estimating the travel distance in feet of a hypothetical particle of water traveling through the aquifer to a pumping well over a selected period of time. ZOCs require proper land use management to minimize the possibility of contaminants entering the groundwater system. The most commonly accepted tools for delineating wellhead protection zones are the calculated fixed radius method, analytical models, and numerical models. These methods are discussed below.

METHODS OF DELINEATION

Calculated Fixed Radius Method

The simplest groundwater model is the Calculated Fixed Radius (CFR) method. In this method, ZOCs are delineated by concentric areas around each well. In the CFR method, the delineation's are calculated based on projected groundwater withdrawal rates and known or assumed aquifer characteristics.

Analytical Models

The analytical model requires the incorporation of basic hydrological information and certain physical characteristics of the aquifer and well. Major assumptions and simplifications to the hydrogeologic regime occur in analytical modeling, but the incorporation of the hydraulic gradient and hydrogeologic boundaries allows for a more realistic representation of the groundwater flow regime than in the calculated fixed radius method.

Numeric Method

The numeric method requires significantly more data. In numeric modeling, a grid is superimposed over the study area. Each square in the grid, called a cell, is characterized by physical parameters which are estimated from data collected from a variety of sources. The sources may include well logs, geologic and hydrogeologic maps, geophysical data, groundwater elevation data, stream flow discharge and meteorological data.

The numeric method generates more accurate results than the CFR or Analytical methods. However, numeric models are very costly to develop. Consequently, numeric models are more commonly used by large utilities with complex aquifers who have the resources to collect the extensive model input required.

ANALYSIS

The CFR method was used to analyze the WHPA ZOCs for each of the NBWD wellfields. This method is the simplest acceptable method of delineation, and generally provides the most conservative area of delineation. The wells in the NWF are near each other, and the wells in the SWF are also near each other. Per the methodology depicted on page 40 of the DOH *Wellhead Protection Program Guidance Document,* April 1995, the ZOCs in the NWF are combined, and the ZOCs in the SWF are also combined, with the center of each WHPA at the geometric center of the wells in each wellfield, as shown on Figure 5-1. ZOCs were calculated using the following CFR formula:

$$r = \sqrt{\frac{Q \times t}{\pi \times n \times H}}$$

Where:
r = Radius of the ZOC
Q = Pumping Rate of Wells, cubic feet per year
t = Time of travel to well, years
n = Aquifer porosity
H = Open interval of wells, feet

WHPA ZOCs were calculated for the NWF based on the total annual water right of 528 ac-ft/yr available to that wellfield, and WHPAs were calculated for the SWF based on the total annual water right of 168 ac-ft/yr available to that wellfield, as shown in Table 1-2. The screened open interval used, H, is 20 feet for both wellfields, because, as shown in Table 1-3, most of the wells in both wellfields have 20-foot screens. The aquifer porosity used is 0.22 as recommended in the Wellhead Protection Program Guidance Document. Radius values calculated for the various times of travel are presented in Table 5-1. Figure 5-1 depicts the delineation of the ZOCs for the both wellfields.

TABLE 5-1

NBWD Wellhead Protection Zones of Contribution
(CFR Method)

	North Wellfield	South Wellfield
Annual Use, ac-ft/yr(1)	528	168
Time of Travel, Years	**Zone of Contribution, feet(2)**	
0.5	912	514
1	1,290	728
5	2,884	1,627
10	4,079	2,301

(1) Annual usage for the NWF and the SWF are based on full utilization of the annual water rights for each wellfield.

(2) A screened interval of 20 feet was used for both wellfields based on construction records available for wells in the wellfields. The ZOCs are centered on the geometric center of each wellfield.

CONTAMINANT SOURCE INVENTORY

An essential element of wellhead protection is an inventory of all potential sources of groundwater contamination in and around the delineated WHPAs. The purpose of the inventory is to identify past, present and proposed activities that may pose a threat to the well or surrounding area. The inventory can also help to plan management strategies and establish a mailing list to notify businesses located within the WHPAs.

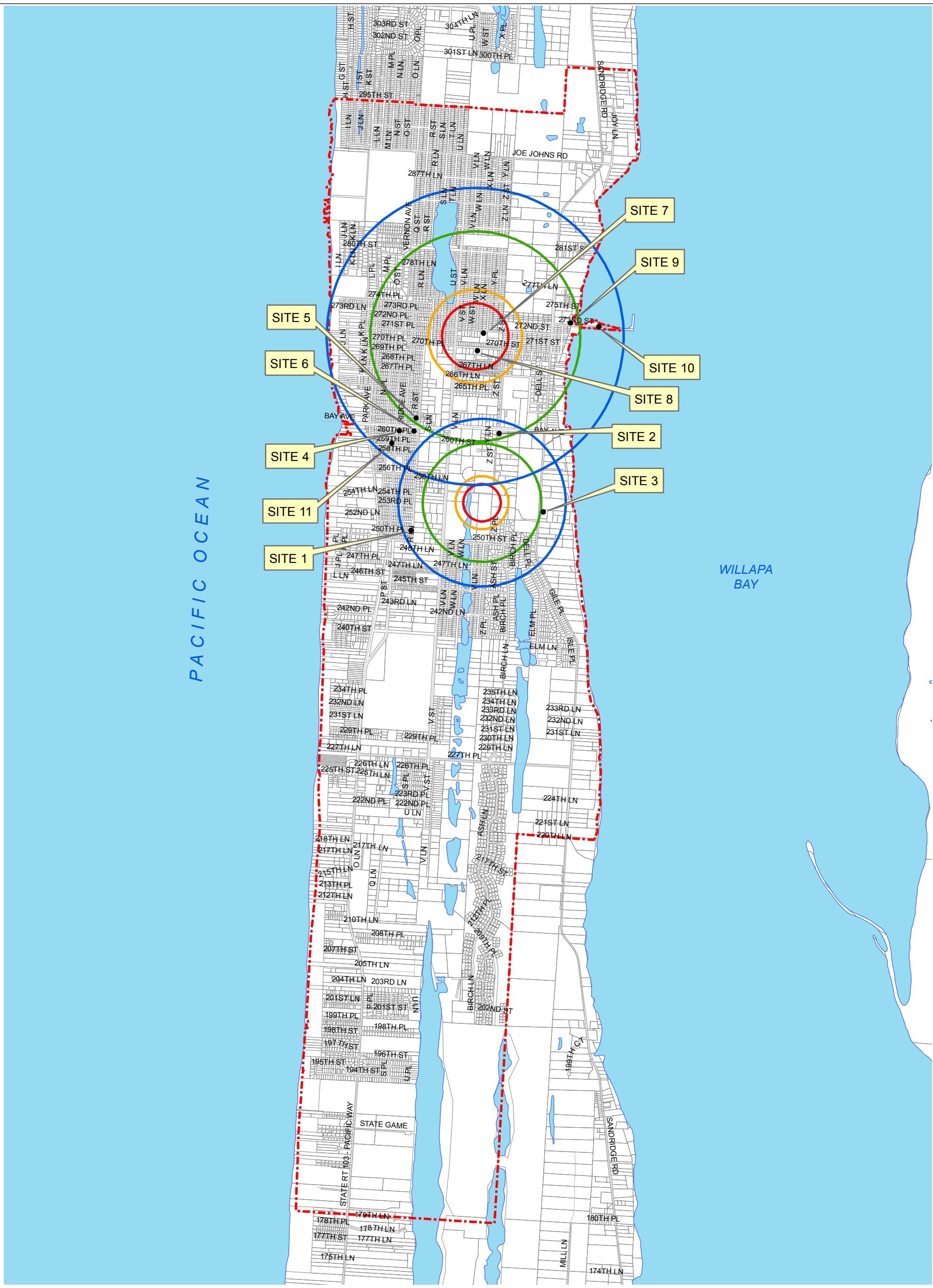
INVENTORY DATA SOURCES

The inventory of potential contaminant sources was compiled using various data sources. Ecology maintains a contaminant database that lists businesses that handle and store potential contaminants. The following databases were used to create the inventory for the NBWD WHPAs:

- *Washington State Department of Ecology Facility Site Atlas:* The Washington State Department of Ecology maintains an interactive map showing regulated facilities and locations of historic spills and leaks at the following website:

  https://fortress.wa.gov/ecy/facilitysite/MapData/MapSearch.aspx

  The web site links to the Underground Storage Tank Program, including records of registered underground storage tanks and underground storage tanks that are known to have leaked, the Dangerous Waste and Materials Generators program, including locations of registered dangerous waste and materials handlers, Title III Hazardous Materials sites, including



Legend

ZONES OF CONTRIBUTION:

- 6 MONTHS
- 1 YEAR
- 5 YEAR
- 10 YEAR
- NORTH BEACH WATER DISTRICT

N

0 2,500 5,000 Feet

NORTH BEACH WATER DISTRICT

FIGURE 5-1
WELLHEAD PROTECTION AREAS

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locations of regulated facilities that treat, store or dispose of hazardous materials in sufficient quantity to pose a threat to the community, regulated Waste Dischargers, and Confirmed and Suspected Contamination Sites. This web site was accessed and a list of facilities in the NBWD area was obtained.

- General Web Searches: General web searches were made for various business that have a potential to cause groundwater contamination, including dry cleaners, auto repair shops, paint shops, and metal plating.

POTENTIAL CONTAMINANT SOURCES

Eleven facilities were identified by the search methods described above. Facilities identified are listed in Table 5-2, and shown in Figure 5-1.

TABLE 5-2

Wellhead Protection Area Potential Sources of Contamination

Site No.	Site Name	Ecology Identifier No.	Site Address	Brief Description
1	T Reardon Plumbing Inc.	16696	25014 R Street	No info given
2	Z Street Phase II	18090	26311 Z Street	Water Quality - Construction SW GP, 2010
3	Peninsula Plumbing & Heating Co.	24385	25216 Sandridge Road	No info given
4	Jacks Country Store/Ocean Park Texaco	5767394	2606 Hwy 103	Underground Storage Tank, 1981 Air Quality Local Authority Reg, 2007
5	Ocean Park Drum	13245376	262nd Street and Ridge Street	Hazardous Waste Generator, 1993
6	Guelfis West (Chrome Dome Automotive Repair)	54475573	1702 Bay Avenue	Underground Storage Tank, 1979 Leaking Underground Storage Tank, 1995
7	AT&T Wireless Ocean Park	4091588	2708 272nd Street	Emergency/Haz Chem Reporter TIER2, 2003
8	Ocean Park Concrete	4355636	2308 270th Place	Sand and Gravel GP, 2007
9	Peninsula Port	8189048	3311 275th Street	Class 4 Facility, Spills, 2006 401CZM Project Site, 2005

TABLE 5-2 – (continued)

Wellhead Protection Area Potential Sources of Contamination

Site No.	Site Name	Ecology Identifier No.	Site Address	Brief Description
10	Wiegardt Brothers Seafood	57449962	3215 273rd Street	Industrial SW GP, 2001 Underground Storage Tank, 2000 Leaking Underground Storage Tank, 1991
11	Hill Auto Body & Towing Inc	None	25901 Vernon Avenue	Auto Body and Paint

In addition to facilities identified on the Ecology Site Atlas and located by internet web searches, it should also be noted that there is no sewer system in the Ocean Park area. That means that all wastewater from all businesses and homes is disposed of into septic tank/drainfield disposal systems.

Potential Sources of Contamination by Wellhead Protection Zone

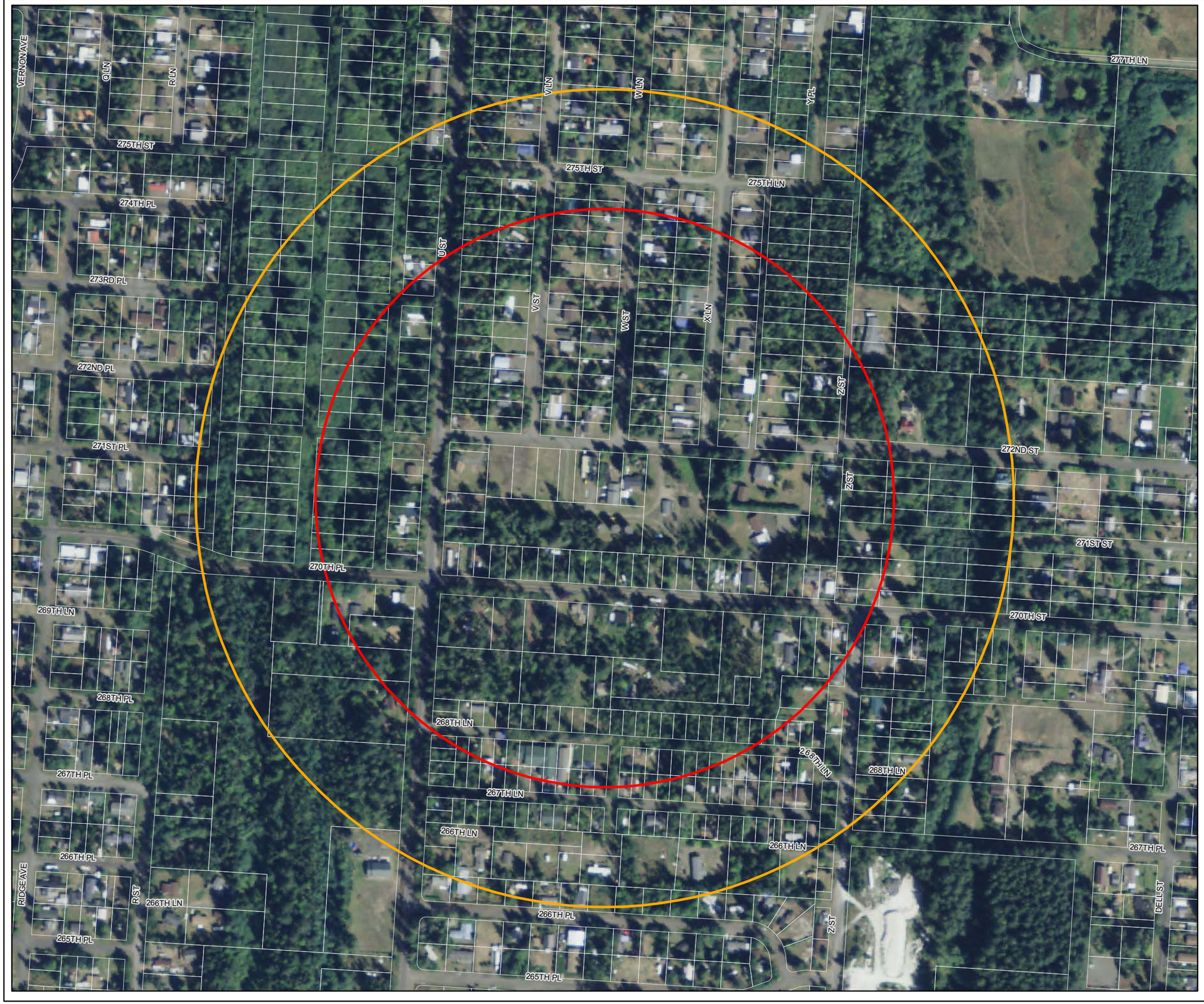
Within a wellhead protection zone, there are many diverse activities, which may contaminate an aquifer, thereby impacting the water supply. A discussion of these activities, their potential effects on groundwater, and the regulatory requirements that may apply are included in the following sections. Potential sources of contamination identified in Table 5-2 are indicated by ZOC in Table 5-3.

TABLE 5-3

Sites by Wellhead Protection Zone

Source	Zone of Contribution	Sites
NWF	6-month	7, 8
NWF	1-year	None
NWF	5-year	2, 5, 9
NWF	10-year	4, 6, 10, 11
SWF	6-month	None
SWF	1-year	None
SWF	5-year	None
SWF	10-year	1, 2, 3

In addition to the sites identified in Tables 5-2 and 5-3, on-site wastewater treatment and disposal systems are located throughout the entire area. Figures 5-2 and 5-3 are aerial views of the 1-year ZOCs for the NWF and the SWF. It can be seen that there is



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- 6-MONTH ZOC
- 1-YEAR ZOC

NORTH BEACH WATER DISTRICT

FIGURE 5-2
EXISTING DEVELOPMENT IN NWF
1-YEAR ZOC

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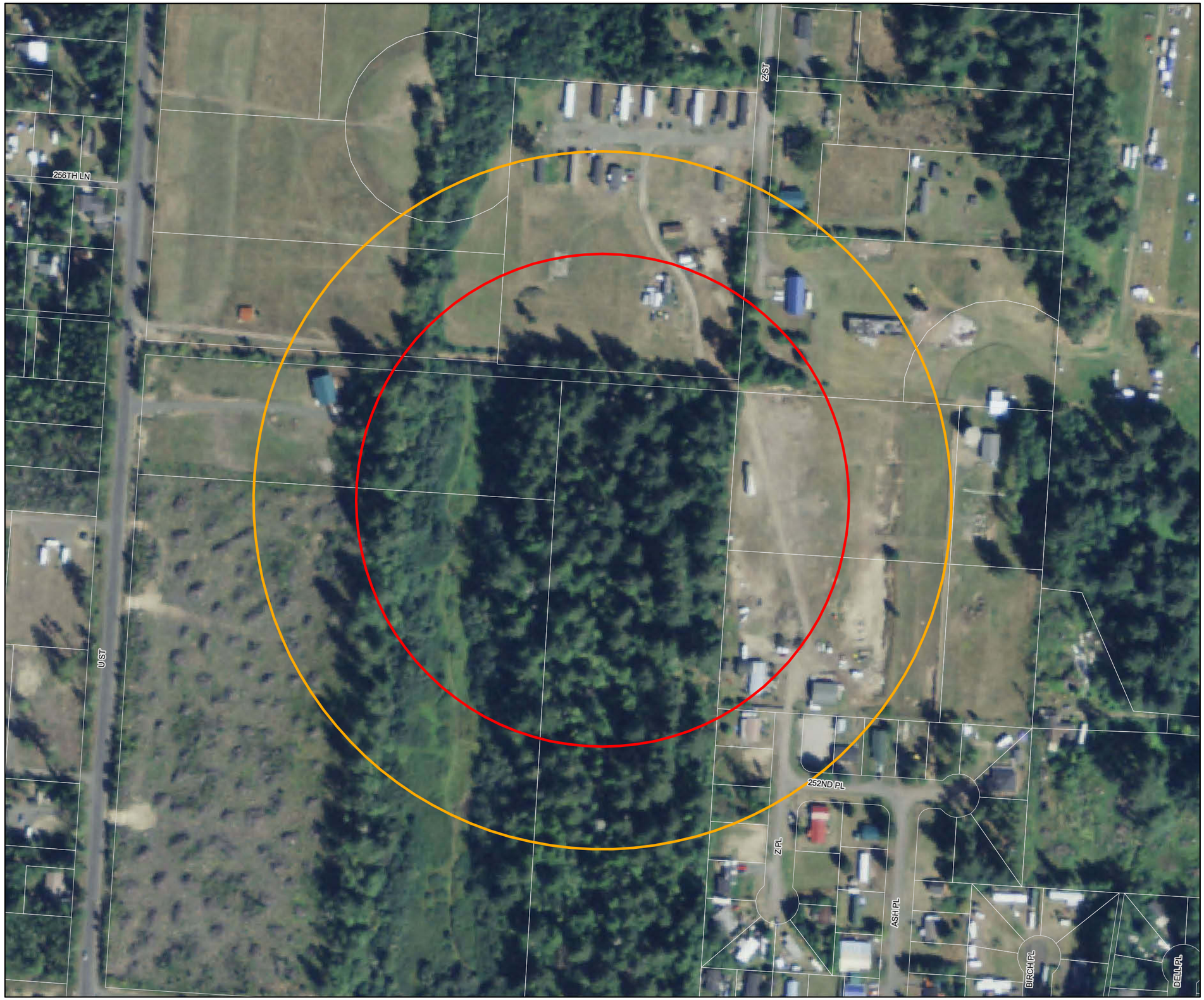

N

0 200 400

Feet

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6-MONTH ZOC

1-YEAR ZOC

NORTH BEACH WATER DISTRICT

FIGURE 5-3
EXISTING DEVELOPMENT IN SWF
1-YEAR ZOC

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development in these areas, and it must be assumed that all facilities in the area dispose of wastewater to on-site wastewater treatment and disposal systems.

Seawater Intrusion

Due to close proximity to Pacific Ocean and Willapa Bay, the North Beach area aquifers are most likely in continuity with the one or both of those saltwater bodies and therefore at risk from seawater intrusion. The potential for seawater intrusion is increased by excessive drawdown on one or more of the wells in the wellfield. Should pumping levels be excessively lowered, elevated chloride concentrations, the most common indicator of advancing saline waters, would be the first indicator that seawater intrusion potential was increasing. Although none of NBWD's wells have exhibited elevated chlorides, this risk should continue to be considered, and steps to minimize the potential and monitor for indications of increased risk should be included in the operations and management of the water system. Specifically,

- Operate the wells at a rate that results in no more than one third of available drawdown.
- Monitor, record, and analyze the drawdown and pumping levels (preferably pressure transducers in each well)
- Monitor, record and analyze monthly chloride residuals from each well for trends.

TYPICAL CONTAMINANTS FROM TYPICAL CONTAMINANT SOURCES

The following sections identify typical contaminants that may come from some typical contaminant sources. Note that only the potential contaminant sources identified in the previous section are known to exist within the NBWD WHPA. Other potential contaminant sources may exist that have not been identified or recorded.

Landfills

A landfill is a disposal facility in which solid waste is permanently placed. Minimum functional standards for solid waste hauling are regulated by the Washington State Department of Ecology under WAC 173-304. These regulations set siting and closure criteria, performance standards, and operating requirements for landfills. Abandoned and improperly maintained landfills and dump sites are often a major source of groundwater contamination. Leachate from landfills poses a threat to groundwater quality should it migrate to the water table. The Department of Ecology is responsible for mitigating dump site cleanup when potentially hazardous leachates are present.

There are no known active or abandoned landfills within the wellhead protection ZOCs for any of NBWD's wellfields.

Commercial and Industrial Activity

Areas of commercial and industrial land use are located within most wellhead protection boundaries. Businesses that may contribute contaminants to the groundwater include dry cleaners, gas stations and other businesses with fuel storage tanks, auto repair shops, metal plating facilities, asphalt and concrete facilities, and machine shops. Wastes generated at these businesses include substances such a petroleum products, solvents, surfactants, heavy metals, and other organic and inorganic materials. These pollutants can potentially enter the groundwater system through inadequate disposal practices or accidental spills. Table 5-5 presents some typical commercial and industrial activities and the potentially hazardous chemicals that may be associated with them.

TABLE 5-4

Chemicals Associated with Commercial and Industrial Activities

Commercial/Industrial Activity	Contaminants
Automobile/Truck Service	waste oils, solvents, acids, paints, soaps
Dry Cleaners	solvents (perchloroethelyene, petroleum solvents, Freon) spotting chemicals (trichloroethane, methylchloroform, ammonia, peroxides, hydrochloric acid, rust removers, amyl acetate)
Cemeteries	fertilizers, pesticides
Country Clubs/Golf Courses	fertilizers, herbicides, pesticides, swimming pool chemicals, automotive wastes
Electric/Electronic Equipment Manufacturers	nitric, hydrochloric and sulfuric acids, heavy metal sludges, ammonium persulfate, cutting oil and degreasing solvent, corrosive soldering flux, waste plating solution, cyanide, methylene chloride, perchloroetheylene, trichloroethane, acetone methanol
Furniture/Wood Manufacturing	paints, solvents, degreasing and solvent recovery sludge
Metal Plating Shops	sodium and hydrogen cyanide, metallic salts, alkaline solutions, acids, solvents, heavy metal contaminated wastewater/sludge
Lawns and Gardens	fertilizers, herbicides, pesticides
Painters, Publishers	solvents, inks, dyes, oils, miscellaneous organics, photographic chemicals
Sand and Gravel Mining	diesel fuel, motor oil, hydraulic fluids
Scrap, Salvage and Junkyards	used oil, gasoline, antifreeze, PCB contaminated oils, lead acid batteries

The siting and operation of facilities that treat, store, or dispose of hazardous waste are subject to the requirements of the Resource Conservation and Recovery Act (RCRA), subtitle C. In Washington State, the Department of Ecology regulates facilities that generate more than 220 pounds of hazardous waste per month under WAC 173-303, Dangerous Waste Regulations. The regulations are significant in that they establish a number of requirements for these facilities including surveillance and monitoring, record keeping, performance and design criteria, and siting and closure procedures. Ecology divides the facilities into three levels of hazardous waste accumulation: Level one facilities generate 2,200 pounds of waste per month or more; level two facilities generate between 220 and 2,200 pounds per month; and level 3 facilities generate less than 220 pounds. Level three generators are exempt from the regulations. All level one and two facilities must initially file a report of their activities with Ecology and update those activities annually.

Underground Storage Tanks

Underground storage tanks (USTs) and leaking underground storage tanks (LUSTs) can be a major threat to groundwater quality. Petroleum products, which may contain impurities that are mobile in the groundwater system, are the most commonly stored substances in USTs. The EPA estimates that 35 percent of all USTs could be leaking. The most common causes of leaks are structural failure, corrosion, improper fittings, and improper installation.

Ecology regulates underground storage tanks in Washington State under WAC 173-360. The regulations require that owners and operators of underground storage tanks comply with the following sections of the regulations:

- Notification, reporting, and record keeping
- Performance standards and operating closure requirements
- Registration and licensing
- Financial responsibility

As of July 1, 1991, owners and operators of all existing nonexempt underground storage tanks must have a permit from Ecology. A valid permit is a requirement for delivery of regulated substances. The permit must be updated annually.

Underground storage tank inspections are performed by Ecology primarily through the information developed in the permitting process. Ecology maintains a file on all permitted USTs in Washington State, as required by RCRA, Subtitle 1. The file provides the site name and address, tank identification number, date of installation, size, tank status, and the substance stored at the site.

Septic Systems

Pacific County Health Department is responsible for regulating and permitting residential and small commercial on-site sewage treatment systems within the county, excluding federal facilities. Contaminants associated with septic tank effluent include pathogenic organisms, toxic substances, and various nitrogen compounds, including ammonia and nitrate, that are highly soluble in water. Most septic drainfields discharge treated sewage effluent to the unsaturated zone above unconfined aquifers. Contaminants from drain fields can percolate to the saturated zone and contaminate groundwater supplies.

A properly designed septic system can provide reasonable protection from groundwater contamination by pathogenic organisms. Nitrate and ammonia discharging from septic systems are generally in small enough amounts that they are sufficiently diluted in the groundwater. An improperly designed septic tank/drainfield in excessively porous soils, however, can allow pathogens to reach groundwater unimpeded. Evidence of this type of septic system failure is not readily visible since drainage from these systems does not cause ponding or odor problems. Contamination from this type of source is very difficult to trace. There are three practical means of protecting a water supply from this type of problem: (1) Make sure that all new septic systems installed in areas of the wellhead protection zone are carefully designed and properly installed. (2) Ensure that existing systems are properly maintained by pumping septic tanks on a regular basis. (3) Educate property owners regarding the proper use and maintenance of their systems.

Perhaps the largest threat to groundwater from septic systems is their improper use. Septic systems are neither designed to remove most chemical wastes from water nor are they capable of removing these substances. Solvents, fuels, waste oil, photo chemicals and a large number of other wastes pass through septic systems without any effective treatment. Many solvents also pass relatively easily through low permeability geologic strata. Therefore, one of the most effective actions that can be taken within a WHPA to improve protection from septic systems is to reduce the amount of inappropriate materials being disposed of through these systems. This may be done through public education and assistance with proper toxic waste disposal. If people are informed as to what should not be dumped into a septic system and the reasons why, and if they are assisted in finding a more appropriate way to dispose of toxic wastes, the likelihood that they will dispose of toxic wastes to their septic systems will be reduced. Generally, information regarding the proper storage and disposal of hazardous wastes and a convenient location for waste drop-off will reduce dumping into septic systems more effectively than an enforcement program. It is virtually impossible to police or regulate the dumping of toxic wastes into individual septic systems.

Improperly Sealed or Secured Wells

Improperly sealed or secured wells can act as direct conduits for contaminants to reach groundwater. It is unknown if there are abandoned wells in the general vicinity of NBWD wellfields.

Accidental Spills

Accidental spills or releases of contaminants can potentially impact groundwater supplies. Potential sources of spills and leaks include underground storage tanks, accidents and poor disposal practices. The Pacific County Emergency Management Agency will respond to emergency situations, such as public water supply contamination. The Pacific County contact person is Stephanie Fritts, who can be contacted at (360) 875-9340 or (360) 642-9340.

The Washington State Patrol is the first responder for hazardous material spills on state and interstate highways. The State Patrol then notifies the Ecology, who in turn authorizes an independent contractor to clean up the spill. In addition to State Highway 103, there are several gravel and paved roadways within the WHPAs of NBWD. The road system is for residential access and not subject to heavy truck transport of hazardous materials. In the case of NBWD, the first responder to a spill will be the water district staff and/or local fire district in coordination with the Pacific County Emergency Management Agency.

Confirmed or Suspected Contamination Sites

Under the Model Toxics Control Act Cleanup, WAC 173-340, the Department of Ecology is responsible for ensuring all hazardous waste sites are properly remediated. This includes confirmed and suspected sites of contamination as well as LUSTs. A separate inventory for each, which includes the status of cleanup efforts, is maintained by Ecology. Ecology conducts an initial site investigation within 90 days of learning of a potentially contaminated site. If this investigation shows that remediation action is required, the site will appear on the Confirmed and Suspected Contaminated Sites Report. The sites are also given a Washington Ranking Mode BIN number between one and five. A rank of one indicates the greatest assessed risk to human health and the environment. The contaminant type and the affected media, such as groundwater, is also noted. Once the remedial action has been completed, Ecology's Toxics Cleanup Program determines if the site can be removed from the list.

MANAGEMENT STRATEGIES

WHPAs have been defined and potential sources of contamination have been identified. In order for this to result in actual protection for NBWD's wells, a management plan must be put into place. The goals of a management plan are to:

- Reduce the likelihood that potential groundwater contaminants will be disposed, spilled, leaked or otherwise discharged in the WHPA such that they could contaminate groundwater.

- Increase the likelihood that any potential groundwater contaminants which do get disposed, spilled, leaked or otherwise discharged in the WHPA will get cleaned up before they reach the public water supply wells.

- Detect any groundwater contamination that may occur before public health is affected.

- Develop a plan of action for the possible event that a major source of NBWD's water supply should become contaminated.

- Support a follow-up study of the USGS study dated 1995 of the groundwater flow and water quality in the sand aquifer of Long Beach Peninsula, Washington.

Minimum requirements for a WHPA management plan are specified in WAC 246-290-135(c). These requirements include the following:

1. Notification to owners/operators of known or potential sources of contamination within the WHPA of the findings of the wellhead protection plan.

2. Notification to regulatory agencies and local governments of the boundaries and findings of the WHPA

3. Documentation of coordination with local emergency incident responders (including police, fire and health departments), including notification of WHPA boundaries, results of the susceptibility assessment, inventory findings, and a contingency plan.

4. Completion of a contingency plan to assure that water system customers will have an adequate supply of potable water in the event of temporary or permanent loss of the principal source of supply.

In order for NBWD to protect its existing wellfields from contamination and manage its resources in a responsible manner if contamination should occur, the association will take the following actions.

- NBWD will ensure that any business that could potentially contaminate the NBWD wellfields be aware that they are located within the WHPA. Notification letters and wellhead protection inventory maps will be sent to the owners/operators of potential contaminant sources.

- Notify private property owners and their tenants with existing on-site septic systems and undeveloped lots of their location within the NBWD WHPA.

NBWD will ensure that the owners/tenants with on-site septic systems that could potentially contaminate the NBWD wellfields be aware that they are located within the WHPA. Notification letters and wellhead protection inventory maps will be sent to the owners/occupants of potential contaminant sources.

- Monitor for nitrates annually.

  Contaminants associated with failing septic systems include pathogenic organisms, toxic substances, and nitrogen compounds. NBWD will not only be aware of non-compliance with MCLs for nitrates, but also trends of increased nitrate levels over a period of time. Increasing nitrate levels could be an indication of source contamination.

- Coordinate with county and local emergency incident responders to implement a spill/response program as outlined further in this chapter.

  NBWD will ensure that local and county agencies are aware of the location of the WHPAs. Notification letters and wellhead protection inventory maps will be sent to the local fire department, Pacific County planning, health and emergency management agencies, and the Department of Ecology.

- Implement the contingency plan outlined in this chapter to ensure that an adequate supply of potable water is provided in the event of temporary or permanent loss of the principal supply.

SPILL/INCIDENT RESPONSE PROGRAM

Spill response planning is an important aspect of both an emergency management plan and a wellhead protection program. Specific response procedures for WHPAs must be determined prior to the occurrence of a contamination incident. The information obtained as a result of the susceptibility assessment and the WHPA inventory can be used to determine what types of spill response measures are necessary for the protection of drinking water sources. In order to be accepted by local emergency responders, spill response procedures for WHPAs will be realistic and easily implemented.

In order for spill response procedures to be effectively executed, coordination, cooperation, and communication among the responding agencies, organizations, and individuals is imperative. Depending on the magnitude and type of the release, any of the following organizations may be involved in a spill response for a WHPA in Washington State.

- *Department of Ecology (Ecology):* The Spill Response Team is responsible for determining the source and cause of the release, and responsible party. If the responsible party is unknown, Ecology will investigate to determine who is responsible and ensure that containment, clean-up, and disposal proceedings begin. The Ecology's 24 Hour Spill Response can be contacted at (360) 407-6300.

- *Department of Health (DOH):* The Department of Health is developing a set of standard operating procedures, in conjunction with organizations such as Ecology's Spill Operations Section and the Association of Fire Chiefs that first responders can use in WHPAs, critical aquifer recharge areas, and other sensitive groundwater areas. DOH also provides assistance through laboratory support and services if necessary to the clean-up effort.

- *Department of Transportation (DOT):* The Washington State DOT can provide spill response assistance through traffic control, equipment, and personnel for non-hazardous clean-up activities on state and interstate highways.

- *Pacific County Emergency Management Agency:* Pacific County has a department designated to respond to emergency situations, such as public water supply contamination. The Pacific County contact person is Stephanie Fritts at (360) 875-9340 or (360) 642-9340.

- *NBWD Water Department Staff:* Initial response to a hazardous spill will most likely be made by NBWD staff or first responders from the local fire department.

CONTINGENCY PLANNING

Contingency planning is an important component of a wellhead protection program. If one or more of NBWD's wells must be taken offline due to contamination, a contingency plan provides immediate mitigation. A properly prepared and updated contingency plan helps ensure the water system, and local officials, are prepared to respond to emergency situations. Contingency planning also includes provision of alternative sources of drinking water. The following steps are necessary for the development of an effective contingency plan:

- Identify maximum capacities of the existing system as to source, distribution system and water rights restrictions. Assume loss of the largest source and reevaluate.
- Evaluate the expansion options of the existing system's capacities relative to existing water rights.

- Identify existing or potential interties with other public water systems.
- Evaluate current procedures and make recommendations on contingency plans for emergency events.

Chapters 2 and 3 of this Plan have documented the existing and future capacity of the water supply, storage and distribution system. It is recommended that NBWD develop its water resources to the full extent provided under existing water rights. Fortunately, NBWD is serviced by wellfields in two distinct locations, so it would be highly unlikely that both of the wellfields will become contaminated at the same time. If any single wellfield becomes contaminated, the remaining wellfield is capable of maintaining a reduced level of service. This report also documents that NBWD has maintained storage capacity in excess of the minimum required by DOH regulations for backup purposes.

Currently, there are no immediate recommendations for interties with adjacent public water systems. NBWD may consider a possible emergency use intertie with Surfside Homeowners Association water system in the future.

If, in spite of the best efforts of NBWD and the owners/operators of potential contamination sources to protect the groundwater resources, contamination does occur, the following contingency plan elements will be implemented:

- Contact the appropriate agency to deal with any spill, leak, or contamination event.

- Isolate the contaminated source from the system and utilize the remaining wellfields and storage to supply customers.

- Inform NBWD customers through use of local media and door to door notification.

- Impose outdoor watering restrictions and usage curtailment as required.

- Supplement the storage tanks with water hauled from a nearby public water system and/or provide bottled water.

- In the event of long-term loss of use of a wellfield, a site for additional source capacity will be investigated.

CHAPTER 6

OPERATION & MAINTENANCE PROGRAM

INTRODUCTION

The objective of this chapter is to provide an evaluation of North Beach Water District's (NBWD's) operation and maintenance (O&M) program and its ability to assure satisfactory management of the water system operations in accordance with WAC 246-290. NBWD's Operation and Maintenance Manual and specific component related documentation are maintained by NBWD for use by operations personnel.

The O&M Program includes the following elements:

- Water System Management and Personnel
- Operator Certification
- System Operation and Control
- Water Quality Monitoring
- Preventive Maintenance
- Emergency Response Program
- Cross-Connection Control Program
- Customer Complaint Response Program
- O&M Improvements

WATER SYSTEM MANAGEMENT AND PERSONNEL

NBWD's water system is managed and operated by NBWD staff under general direction of the NBWD Board of Commissioners. Mr. Bill Neal is NBWD General Manager, Mr. Jack McCarty is the NBWD Office Manager, Ms. Lisa Larcom is the NBWD Billing Clerk, Mr. Bob Hunt is the NBWD Field Supervisor, and Mr. Dennis Schweizer is the NBWD Treatment Plant Operator.

OPERATOR CERTIFICATION

Department of Health (DOH) requires all Group A water systems to have at least one certified Water Distribution Manager (WDM) under WAC 246-292-050. The WDM must further be certified at a level equal to or higher than the water system's classification rating as described in Table 6-1 and in accordance with WAC 246-292-040.

TABLE 6-1

Water System Group Classification

Classification	Population Served
Group 1	Less than 1,500
Group 2	1,501 to 15,000
Group 3	15,501 to 50,000
Group 4	Greater than 50,000

NBWD serves between 1,501 and 15,000 people on a full-time basis, and, therefore, is required to have a WDM Level 2. NBWD operates two water treatment facilities, rated by DOH as requiring a Water Treatment Plant Operator 2 (WTPO 2) in charge of the water treatment facility. Additionally, NBWD is required to have a Cross-Connection Control (CCC) Program and must ensure that a Cross-Connection Specialist (CCS) is responsible for overseeing the program and for periodic inspections of premises for cross-connections. Finally, NBWD must ensure that a Backflow Assembly Tester (BAT) is responsible for inspecting, testing, and monitoring backflow prevention assemblies in accordance with WAC 246-290-490. NBWD can have a CCS on staff or have an outside CCS specialist review their CCC program. NBWD can also have a BAT on staff to perform the backflow assembly tests or can allow the customers to have their device tested by an approved BAT. Table 6-2 provides a list of NBWD personnel, positions and certifications.

TABLE 6-2

NBWD Water System Personnel Certifications

Staff	Position	Operator No.	Certifications
Bill Neal	General Manager	012803	WDM 2, WTPO 1, CCS
Robert Hunt	Field Supervisor	011725	WDM 2 WTPO 2
Dennis Schweizer	Treatment Plant Operator	012695	WDM 2 WTPO 2
Jonathan Fleming	Water Service Worker I	013551	WDM 1
Joshua Maxey	Water Service Worker I		

PROFESSIONAL GROWTH REQUIREMENTS

In order to promote and maintain expertise for the various grades of operator certification, Washington State regulations require all certified operators meet professional growth requirements by completing no less than three continuing education units (CEUs) every three years. Programs sponsored by both Washington Environmental Training Resource Center (WETRC) and the American Water Works Association (AWWA) Pacific Northwest Subsection are the most popular sources of CEUs for

certified operators in Washington State. The professional growth requirement may also be met by advancement, by examination, or by certification in a different classification.

The NBWD General Manager monitors the status of staff CEUs and assures that resources to obtain training are provided by NBWD as necessary to maintain these credits.

SYSTEM OPERATION AND CONTROL

MAJOR SYSTEM COMPONENTS

The locations of the major system components are shown on Figure 1-11, the system facilities map. System facilities are described in Chapter 1 of this Plan under the heading Inventory of Existing Facilities. A description of the normal operation of each facility is given in the following sections.

Sources of Supply

Water from the North Wellfield (NWF) is pumped by the individual well pumps through the NWF treatment system and into the NWF Reservoirs. Similarly, water from the South Wellfield (SWF) is pumped by the individual well pumps through the SWF treatment system and into the SWF Reservoirs. Historically, systems were in place to turn the wells on and off based on water levels in the reservoirs. However, those systems are no longer functioning and for the past few years the wells have been operated manually. This has resulted in frequent overflows of the reservoirs and an unknown amount of water loss, which is thought to contribute significantly to Distribution System Leakage (DSL). NBWD is planning to replace the operational control system, which will remedy this problem.

Treatment

Water flows through the treatment systems when the well pumps are running. The aeration systems run when the well pumps run. As discussed in Chapter 1, the treatment system seems to provide adequate treatment with the ozonation system turned off, so NBWD is no longer running the ozonation systems at either wellfield site. Backwash of the filter units is triggered either by volume of water filtered or by elapsed time since the last backwash, whichever comes first. Backwash water is discharged to local infiltration areas where it is allowed to percolate into the ground.

Reservoirs

As described in Chapters 1 and 3, NBWD operates three reservoirs at the NWF site and one reservoir at the SWF site. These reservoirs are depicted in Figures 1-6 and 1-7. Capacity analysis of the reservoirs is provided in Table 3-9. Water from the wells is pumped to the reservoirs through the treatment systems. The water level in the reservoirs

is monitored visually based on water level gages on the sides of the reservoirs. Wells are turned on and off manually based on water levels observed on the water level gages. As shown in Table 3-9, the NWF reservoirs are 45-feet tall, and the SWF reservoir is 40-feet tall. This is not enough elevation to provide the pressure required for water system operation, so water from the reservoirs is pumped into the water distribution system to maintain system pressure.

Pumping Facilities

In order to maintain adequate distribution system pressure, there are pumping stations located at both the NWF and the SWF sites. The pumping systems maintain output pressures of 60 psi. The NWF booster pump control system has not been operating properly, so NBWD staff have been turning booster pumps on and off manually. Pump station output pressure is controlled by a pressure reducing valve, so having unneeded pumps on does not create excessive system pressure. However, having an inadequate number of pumps on can result in low system pressure. Therefore, operations staff tend to leave unneeded pumps on rather than risk having an inadequate number of pumps on, which means that the NWF booster pump system uses more energy than is necessary to meet system demands. This also means that operations staff need to go by the pump station in early morning to turn on pumps prior to morning demand, and in late evening to turn off unneeded pumps, and it means that operation staff need to go by the pump stations regularly to check the pumps.

The SWF booster pump system output pressure is controlled by a Variable Frequency Drive (VFD) system, which adjusts the booster pump speed to control distribution system pressure. The system to turn pumps on and off at the SWF booster pump station is also not working properly, and, like the NWF booster pump system, booster pumps are turned on and off manually. When demand is low, the control system slows down the pumps, and when demand is high, the control system speeds up the pumps.

System Control

As discussed above, the control systems for the NWF and SWF facilities are not working properly, resulting in the need to turn wells and booster pumps on and off manually. This results in wasted water, wasted energy, additional staff time costs, and reduced system reliability. In addition, there is no centralized control system. Since both booster pump systems are controlled by output pressure, it is a problem getting both systems to run without one system overpowering the other. A centralized control system could be designed to operate the booster pump systems as needed to meet varying system demand in different parts of the system at different times. In addition, a centralized control system could allow for centralized monitoring and alarm systems at a central location, so that system conditions and system alarms can be better monitored.

As described in Chapter 1, the NBWD water system is a merged composite of two separate systems. This is the major reason why there is currently no centralized control

system. It is also a contributing factor as to why the existing control systems at the NWF and SWF facilities are not operating properly. Neither previous owners saw much need to invest in control systems that would soon be the responsibility of the future owner. However, now that the system is under unified and stable ownership, NBWD views improvements and consolidation of the control system as a high priority.

Distribution System

NBWD maintains more than 56 miles of pipeline, which interconnects the wells, storage, and pumping stations with consumer service connections. A list of total pipe by size is presented in Table 1-5. Figure 1-11 shows the location of all distribution pipelines and their size. The majority of the distribution piping system is made up of 2-inch pipe. Chapter 3 identifies water system hydraulic deficiencies. Most of the existing two-inch pipe is adequate for existing demands, but is not adequate for fire flow. There are no existing fire hydrants on two-inch water mains so this does not show as a deficiency in the hydraulic analysis. However, if fire hydrants are to be eventually installed at 900-foot intervals as required by WAC 246-293-640, then significant amounts of 2-inch water main will need to be replaced with larger mains.

Operation and maintenance of the water distribution system includes water quality sampling, water main flushing, valve exercising, and regular inspection and repair of water main leaks and breaks.

WATER QUALITY MONITORING

NBWD receives an annual report from DOH that indicates what water quality tests are required and when they are required. In addition, NBWD is required to prepare a Coliform Monitoring Plan (WAC 246-290-300 (3) (b)), and Inorganic Chemical Monitoring Plan (WAC 246-290-300 (4) (f)), and an Organic Chemical Monitoring Plan (WAC 246-290-300 (7) (e)). Copies of the monitoring requirements for 2014, and the coliform, inorganic chemical, and organic chemical monitoring plans are included in Appendix G. An analysis of NBWD's most current water quality test results can be found in Chapter 3. NBWD is also required to publish a Consumer Confidence Report (CCR) every year to provide customers with water quality data and system information. A copy of the most recent CCR can be found in Appendix H.

PREVENTIVE MAINTENANCE

The most cost-effective method for maintaining a water system is to provide a planned Preventive Maintenance (PM) program. A planned PM program can provide the optimum level of maintenance activities for the least maintenance cost. Typical tasks that are performed on a daily, monthly, or annual basis are listed below in Table 6-3.

TABLE 6-3

Preventive Maintenance Tasks

Preventive Maintenance Tasks and Frequency	
Daily • On-call 24 hours per day. • Respond to customer inquiries. • Respond to service requests. • Monitor for leaks in the system. • Visit well sites to record meter readings and ensure proper operation of disinfection facility and wells. • Monitor water level in the reservoir. • Record production and backwash meter readings.	**Weekly** • Test and record finished water color. • Test and record finished water iron and manganese. • General cleaning and housekeeping. **Monthly** • Collect routine coliform samples. • Inspect reservoir hatches, vents, and screens. **Annual** • Inspect all backflow prevention devices. • Flush distribution system and repair leaks (more often as needed). • Inspect wellhead protection area for contaminant sources. • Inspect and exercise hydrants and valves. **Every 5 Years** • Clean reservoirs (as needed). • Check filter media.

Reservoirs

Improperly maintained reservoirs can cause contamination in public water systems. This can result from contaminants entering the reservoir through cracks or openings at the vent, overflow or drain screens. Deteriorating hatch covers and vandalism can also compromise reservoir water quality. Poorly designed and maintained reservoirs can hamper the emergency operation of a water system. If reservoir drains are not functioning properly, it may be difficult to purge a contaminant from the system. Written documentation of reservoir maintenance must be completed with each inspection and repair, and a copy of the report retained on file.

All four of NBWD's reservoirs received interior inspections and cleaning in 2006 and it was determined no further action was necessary at that time.

One problem that can occur in reservoirs, particularly in tall narrow reservoirs such as the ones at NBWD, is stratification and stagnation of water. Stratification occurs when the water in the reservoir is warmer than the water entering the reservoir. Colder water is

denser than warmer water, and sinks to and remains at the bottom of the reservoir until it exits the reservoir. Water above this cold layer can remain in the reservoir for months, potentially growing bacteria. Then when a large water demand occurs that draws this water out of the reservoir, or when colder ambient temperature causes the water in the reservoir to cool to or below the temperature of the water entering the reservoir, bacteria can move into the distribution system, potentially resulting in coliform MCL violations. If this becomes a problem, the common remedy is reservoir mixing.

The NBWD reservoirs have separate inlets and outlets, with the inlets discharging to the reservoirs approximately half way up the sides of the reservoirs. This design may help to prevent water stratification. Also, if ambient temperatures never get high enough to raise water temperature in the reservoirs enough to cause stratification, or if the reservoir materials provide adequate insulation to prevent the temperature differential, then stratification may never occur and water stagnation in the reservoirs may not be a problem.

To determine if stratification and stagnation of water in the NBWD reservoirs is a problem, NBWD will consider conducting stratification studies on the reservoirs toward the middle to end of summer. A temperature profile can be obtained by lowering a temperature probe into each reservoir and recording the temperature at different depths. If these studies show reservoir stratification and/or water stagnation, options will be considered to create reservoir mixing.

Wells

Routine maintenance for the wells includes keeping records of water meter readings, discharge pressures, sounding of static and pumping water levels in each well, and keeping the well facilities clean. Water quality samples are taken at each well as required by DOH. Summaries of the total annual production of each wellfield, as well as peak daily production are maintained.

Distribution System Valves

Good preventive maintenance dictates that all valves be exercised regularly. An important aspect of distribution system valve maintenance and record keeping is to ensure that distribution valves are completely open. A partially closed valve can reduce peak day operation and fire flow. NBWD is currently developing and implementing a plan that exercises valves in the system on an annual basis. NBWD keeps records of valve maintenance.

Hydrants

Hydrants should be inspected regularly and repaired if necessary. It is important to maintain good records of hydrant maintenance. NBWD flushes and inspects fire

hydrants annually. The following recommended procedure for testing fire hydrants has been adapted from the American Water Works Association (AWWA) (1989).

- Check appearance of hydrants for visible damage or leaks. Check for residue stains on the hydrant.
- Remove an outlet nozzle cap and sound for leakage.
- Check for presence of water or ice in the hydrant body with a plumb bob.
- Replace the outlet nozzle cap. Open the hydrant a few turns and allow air to vent. Tighten cap.
- Open the hydrant fully.
- Check for leakage at flanges and around outlet nozzles, packing, and seals.
- Partially close the hydrant so the drains open and water flows through under pressure for about 10 seconds, flushing the drain outlets.
- Close the hydrant completely.
- Remove an outlet nozzle cap and attach a fire hose or some other deflector.
- Open the hydrant and flush.
- Close the hydrant and check for operation of the drain valve.
- Check the main valve for leakage.
- Remove all outlet nozzle caps, clean and lubricate threads.
- Check chains and cables for free action.
- Replace caps and tighten.
- Check lubrication of operating nut threads.
- Locate and exercise auxiliary valve. Leave open.

Distribution System Flushing

Distribution system flushing is conducted on an annual basis. A plan is being developed and implemented to routinely flush designated areas to help reduce stagnant water, and prevent water quality problems.

Meters

Accurate water metering is an essential financial and conservation-oriented component of water system infrastructure. Without accurate source meter readings, NBWD cannot determine well pump performance or well output. Without service meters NBWD cannot bill equitably for water usage and cannot determine how much water production is leaking from the distribution system.

NBWD water distribution system is fully metered, per Water Use Efficiency Rule requirements. Tracking of total water sales and regular comparison to total water production is important to monitor the condition of the water distribution system. As water meters age, they tend to under-report usage. Low reading meters can result in lost revenue and artificial inflation of DSL rates. Typical water meter life is approximately

10 years. Water meters can generally be replaced for less than the cost of testing and repairing water meters. Therefore, a water meter replacement program on approximately a 10-year cycle will help to keep water sales data accurate.

Water Billing

Water billing software has two important functions: Creating water bills and tracking payments to support the operation of the water system, and regular tabulation of total volume of water sold, which by comparison with water produced, is an indicator of the condition of the water distribution system.

EMERGENCY RESPONSE PROGRAM

Water utilities have the responsibility to provide an adequate and reliable quantity and quality of water at all times. To meet this requirement, utilities must reduce or eliminate the effects of natural disasters, accidents, and intentional acts. Although it is not possible to anticipate all potential disasters affecting NBWD's water system, formulating procedures to manage and remedy common emergencies is appropriate.

NBWD will regularly review and practice its emergency response plan. An Emergency Response Planning Guide is available at the following website:

https://fortress.wa.gov/doh/eh/dw/publications/publications.cfm?action=pubdetail&type=title&PubId=203&CFID=245767&CFTOKEN=36023621

Following is a summary of emergency response information and actions that may be required in typical emergency situations.

WATER SYSTEM PERSONNEL EMERGENCY CALL-UP LIST

Table 6-4 provides phone numbers for emergency contacts including response agencies, governments, and material suppliers.

TABLE 6-4

Water System Emergency Phone List

Agency/Group	Contact	Phone Number
Fire/Police		911
NBWD Business Office	Bill Neal, General Manager	Office: (360) 665-4144 Mobile: (360) 244-0068
	Jack McCarty, Office Manager	Office: (360) 665-4144
	Robert Hunt, Field Superintendent	Office: (360) 665-4144
Electrical	Public Utility District No. 2	(360) 642-3191
Telephone Service	Century Telephone	(800) 954-1211

TABLE 6-4 – (continued)

Water System Emergency Phone List

Agency/Group	Contact	Phone Number
Testing Lab	Columbia Analytical Services, Inc.	(360) 577-7222
Washington State Department of Health	SW Regional Office, Teresa Walker, P.E.	(360) 236-3030 (360) 236-3032
	24-Hour Emergencies	(877) 481-4901
Washington State Department of Ecology	Emergency Spill Response	(360) 407-6300
Pacific County	Emergency Management	(360) 875-9340
	Public Works	(360) 875-9368
	General Information	(360) 875-9300
	Planning Department	(360) 875-9356
	Road Maintenance	(800) 875-9380
State Wide One-Call	Utility Locates	(800) 424-5555
Gray & Osborne, Inc. Engineering Services	Olympia Number	(360) 292-7481
	Seattle Number	(206) 284-0860

EMERGENCY PROCEDURES

Bacterial Contamination of Water Supply

Bacterial contamination of the water supply can result from such items as main breaks, backflow events, or pollution from an isolated source. Any time coliform bacteria are detected in a water system sample, the DOH regional office should be notified as soon as possible. The contact number is listed in Table 6-4. WAC 246-290-320 (2) further specifies specific follow-up procedures in the event coliform bacteria are detected in the water system. Table 6-5 lists additional appropriate actions to be taken in the event of the contamination of the water supply.

TABLE 6-5

Water System Bacterial Contamination Response Actions

Distribution System Contamination
• Perform chemical analysis at various locations within the system, including the reservoirs and at system extremities.
• Disinfect distribution lines as dictated by the nature of the contamination.
Reservoir Contamination
• Isolate reservoir from system.
• Inspect vent screens, hatches, and piping to identify source of contamination.
• Resample to confirm contamination. Take multiple samples at different locations in Reservoir, if possible.
• Check distribution system for presence of contamination.
• If reservoir water is contaminated and, therefore, considered unsuitable for consumption, drain and clean reservoir.
• Disinfect reservoir if bacteriological standards are exceeded. Follow AWWA Standards. A 50-ppm chlorine solution in the reservoir can be obtained by adding 97 gallons of 5.25 percent chlorine bleach per 100,000 gallons of storage.

Inorganic Chemical/Physical Characteristics Exceedance

Inorganic Chemical/Physical Characteristics (IOC) samples are routinely collected from water supply sources, generally once every three years, unless monitoring waivers have been issued, or a higher frequency has been required. IOC tests include numerous different chemicals. If routine IOC samples detect one or more chemicals in excess of an MCL, additional samples may be collected specifically for that chemical if it reduces follow-up chemical testing costs. If practical, the source of supply that exceeds the IOC MCL should be taken out of service until the cause of the problem is identified and corrected. Follow-up procedures in the event of an Inorganic Chemical/Physical Characteristics MCL violation are specified in WAC 246-290-320 (3). Follow-up actions may vary depending on the specific chemical detected and the level at which it is detected. The DOH regional office should be contacted at the number listed in Table 6-4 to coordinate follow-up sampling and appropriate responses.

Organic Chemical VOC and SOC

Organic Chemical VOC and SOC samples are routinely taken from water supply sources, generally once every three years, unless monitoring waivers have been issued, or a higher frequency has been required. VOC and SOC tests include numerous different chemicals. VOCs and SOCs are generally not detected in water supply sources. Therefore, any detection of VOCs or SOCs may warrant follow-up investigation even if it does not exceed an MCL. If routine VOC or SOC samples detect one or more chemicals,

additional samples may be taken specifically for that chemical or possibly for a surrogate such as Total Organic Carbon if it reduces follow-up chemical testing costs. If practical, the source of supply from which the VOCs or SOCs have been detected should be taken out of service until the cause of the problem is identified and corrected. Follow-up procedures in the event of a VOC or SOC detection are specified in WAC 246-290-320 (6). Follow-up actions may vary depending on the specific chemical detected and the level at which it is detected. The DOH regional office should be contacted at the number listed in Table 6-4 to coordinate follow-up sampling and appropriate responses.

Power Failure

Various types of weather can cause a loss of power. These weather conditions include wind, lightning, freezing rain, or snowstorm. Commonly trees or tree branches fall on power lines due to wind, freezing rain or snow, causing power disruptions. Downed trees can also make it difficult to access the location of the power outage to implement repairs. Additionally, power can be lost through traffic accidents.

In the event of a power outage, NBWD staff will first check reservoir levels visually. The possible length of the power outage will be estimated and customers will be notified of the emergency and water conservation will be requested through radio, television, and newspaper and, if needed and available, through a police loudspeaker system.

NBWD has four diesel powered generators with a combined total capacity 480 kW. Automatic transfer switches automatically start the generators on power failure. These generators are adequate to power all facilities at both wellfields.

Severe Earthquake

A severe earthquake can result in distribution system breaks and structural damage to the wells and reservoirs. Table 6-6 provides procedures to follow in the event of a severe earthquake. A severe earthquake can also cause a power failure. See Power Failure, above.

Note: In the event of a large earthquake along the Pacific coast there is a possibility of a resultant tsunami. The possibility of a tsunami should be taken into consideration when determining appropriate follow-up action immediately following a large earthquake. See section on tsunami later in this chapter.

TABLE 6-6

Severe Earthquake Response Actions

System Component	Proposed Actions
Reservoir	• Observe reservoir for visual signs of structural damage. • If structural damage is apparent, drain reservoir and inspect the interior, exterior, and roof of the reservoir. • If leakage is suspected, isolate reservoir and monitor water level.
Distribution Lines	• Close valves to isolate breaks. • Check reservoir level. • Notify water customers of emergency and request water conservation.
Wells	• Inspect wells and treatment for operation. • Inspect well seals to prevent contamination from entering the wellhead. • Inspect for alignment of pump column and casing.
Note:	• In the event of a large earthquake along the Pacific coast, there is a possibility of a resultant tsunami. The possibility of a tsunami should be taken into consideration when determining appropriate follow-up action immediately following a large earthquake. See section on tsunami later in this chapter.

High Wind

High wind can cause downed trees and tree limbs. These, in turn, can block roads and cause power outages. Chain saw, cable, and winch may be necessary to clear downed trees to access facilities. See section on Power Failure, above.

Cold Weather Conditions/Severe Snow Storm

Extended cold weather conditions could cause freezing problems at shallow service connections, valve vaults without an insulating earth cover, reservoirs, and water supply and treatment facilities. Heavy snowfall may impede employees from reaching a problem area and can cause collapse of structures. Water supply should not be interrupted because flowing water is used to prevent pipes from freezing. Heavy snow and/or freezing rain can cause power outages. Commonly, trees or tree branches fall on power lines due to wind, freezing rain or snow, causing power disruptions. Downed trees can also make it difficult to access the location of the power outage to implement repairs. See Power Failure, above. Table 6-7 addresses the possible emergency events and response actions that will be taken in the event of a severe snowstorm.

TABLE 6-7

Severe Freezing/Snowstorm Response Actions

System Component	Proposed Actions
Facilities Access	• Have chains and snow gear ready for maintenance equipment and vehicles. • Contact Pacific County Public Works to expedite plowing to any problem area. • Heavy snow and/or freezing rain can cause downed trees and tree branches, blocking access to some areas. Chain saw, cable, and winch may be necessary to clear downed trees to access facilities.
Reservoir	• Clear snow from roads and walkways. • Clear ice from level gauges, overflows, and vents.
Distribution Lines	• Maintain mapping of valve locations to locate valves as needed. • Frozen lines can be wrapped with heat tape.
Wells	• Clear snow from well access roads. • Inspect wells and treatment for operation. • Install space heater at wells as necessary.

High Water and Flooding

Heavy rains and/or snowmelt can cause the water levels to rise and reach a flood level. Table 6-8 addresses the possible emergency events and response actions that will be taken in the event of high water or flooding. The NBWD area is in the Pacific County Flood Control District #1 which provides flood control facilities including ocean outfalls, surface drains, and pipes that control surface water during the heavy winter storms. Generally, flooding is confined locally as the groundwater level rises above ground level. Onsite septic systems may become flooded and non-operative. Flooded systems could become sources of contamination in the distribution system. If flooding overtops wells, wells should be considered contaminated until sampling indicates acceptable water quality.

TABLE 6-8

High Water/Flooding Emergency Response Actions

System Component	Proposed Actions
Reservoir	• No action should be required as reservoirs are above flood level.
Distribution Lines	• Test for coliform bacteria.
Wells	• Inspect wells and treatment for operation. • Test for coliform bacteria.

Tsunami

The North Beach area is vulnerable to tsunami (tidal wave). A tsunami could be caused by a large earthquake felt locally, or could be caused by a large earthquake at a distant location such as Japan. For tsunamis generated by distant events, a tsunami early warning system is in place. For locally generated tsunamis there may not be time for an early warning system to provide notification. The primary defense against a tsunami is to move to high ground. In the event of a major earthquake all people should move to high ground until the threat of a tsunami has passed.

Damage caused by a tsunami can include flooding of facilities and washing away of structures and water mains. Wells in areas that have been inundated should be considered contaminated until they can be cleaned, disinfected and tested. If storage reservoirs are not over-topped or damaged, water in the reservoirs can most likely be considered safe. If a tsunami were to flood the NBWD wellfields, then the water booster pump systems would most likely be inundated, and would require major repairs to be placed back in service. It is also possible that a tsunami could damage power supply to the entire North Beach Peninsula, so that only emergency power supplies, such as the North Beach backup power generators, may be available. Water from the NBWD reservoirs could be supplied to local residents in need of safe water supply from the piping at the wellfield control buildings. It would be important to maintain the safe supply of water in the NBWD reservoirs until water supply can be restored. Therefore, valves at the reservoir site should be closed as necessary to prevent loss of water from the reservoirs.

CROSS-CONNECTION CONTROL PROGRAM

WAC 246-290-490 (3) establishes the minimum requirements for a cross connection control program. The regulation identifies ten elements that must be addressed in a cross connection control program. These elements are further detailed in the DOH Publication *Guidance Document: Cross-Connection Control for Small Water Systems, March 2004.* These elements are summarized as follows:

1. Instrument of Legal Authority to Implement Program
2. Procedures and Schedules for Evaluating Service Connections
3. Procedures and Schedules for Eliminating and Controlling Cross-Connections
4. Qualified Personnel to Implement Program
5. Ensure that Approved Backflow Preventers Are Operating Correctly
6. Ensure that Backflow Preventers Are Tested Properly
7. Procedures for Responding to Backflow Incidents
8. Consumer Education
9. Cross-Connection Control Record Keeping
10. Additional Requirements if Reclaimed Water Is Used

NBWD Rules and Regulations Part 1.01.100, revised September 16, 2013, state that cross connections are prohibited, identifies authority of NBWD to enforce their cross connection control rules and requires backflow prevention where cross connections cannot be eliminated. A copy of NBWD Rules and Regulations are included in Appendix D. NBWD has also prepared a draft Cross Connection Control Program, which has not yet been adopted by the NBWD Board. Copies of the draft NBWD Cross Connection Control Program are included in Appendix I. The ten required elements of a cross connection control program summarized above are addressed in the draft NBWD Cross Connection Control Program.

PRIORITY SERVICE LIST

There are three categories of business establishments that may pose a hazard to the water system.

Category One Services

Category one services pose the highest degree of hazard and includes the following facilities:

- Printers
- Medical laboratories
- Chemical companies
- Radiator shops
- Battery, fertilizer, and paint manufacturers
- Pest control businesses
- Janitorial companies

Category Two Services

Category two services are considered less hazardous and include the following:

- Doctor, dentist, and veterinarians' offices
- Blood banks
- Drug rehabilitation centers
- Car washes
- Photo labs
- Commercial laundries
- Nursing homes and hospitals

Category Three Services

The least hazardous service category includes the following types of businesses:

- Food processing facilities
- Dairy establishments
- Beverage and candy manufacturers
- Massage and health spas
- Motels and schools with pool, spa, or sauna facilities

NEW AND EXISTING CROSS-CONNECTION DEVICES

NBWD currently has sixteen cross-connection control devices located within the water system. They are located at the following services:

- Ocean Park School
- Free By the Sea
- Port of Peninsula
- Golden Sands
- Queen Fisheries
- Wiegardt Brothers Inc.
- Coast Seafood Company
- Ocean Aire Trailer Park
- Loomis Lake State Park
- Pacific Pines
- Taylor Resources
- Department of Fisheries
- Peninsula Senior Center
- Sunset View Resort [Fire Flow]
- OB School District 101 [Fire Flow]
- Gary McGrew [Residential]

CUSTOMER COMPLAINT RESPONSE

NBWD rarely receives complaints about water service, but when complaints are received, they are taken seriously. Complaints are logged in at the NBWD office and a water system operator is sent to investigate the complaint. Depending on the findings of the complaint investigator, appropriate actions are taken to resolve the complaint. If a customer feels that their complaint is not being addressed properly, all customers of the water system have access to NBWD Board at regularly scheduled meetings to be heard regarding their concerns/complaints.

O&M IMPROVEMENTS

This section reviews operations and maintenance activities, schedules and needs as identified in the first part of this chapter and identifies possible operations or system changes that could improve or streamline operations.

WATER SYSTEM MANAGEMENT AND PERSONNEL

The scope of this Plan does not include a comprehensive evaluation of the staffing needs and adequacy of staffing. Due to complications in merging two separate water systems, problems with control systems at both wellfields, and lack of a centralized control system for the whole system, staff are at times kept busy with manual operation of source, treatment and pumping facilities. Installation of a new, centralized monitoring and control system will reduce requirements for staff to manually operate facilities and focus more on other aspects of system operation, maintenance, and improvements. NBWD Board have been supportive of assuring that adequate staff is provided to accomplish the system operations requirements. NBWD management will continue to monitor staff requirements and adjust staffing levels as needed to assure adequate staffing.

NBWD would like to develop in-house capabilities to complete water main replacement and water main extension projects. Water main construction generally requires a three to four person crew, including a backhoe operator, and equipment including a backhoe for digging and filling trenches and for helping to lift sections of pipe, a dump truck for hauling unsuitable excavation material away and for hauling suitable fill material to the site, and a flat bed trailer for hauling sections of pipe and fittings from stock areas to the construction site. Additional construction crew may also be needed at times for traffic control.

SYSTEM OPERATION AND CONTROL

The existing operations and control systems for both wellfields are in disrepair and need to be rehabilitated and/or replaced. NBWD intends to rehabilitate existing control systems and/or install new control systems at both wellfields, and install a new centralized monitoring and control system at the NBWD business office within the next year.

WATER QUALITY MONITORING

No deficiencies in water quality monitoring have been identified.

PREVENTIVE MAINTENANCE

No deficiencies in Preventative Maintenance have been identified.

EMERGENCY RESPONSE PROGRAM

No deficiencies in Emergency Response Program have been identified.

CROSS-CONNECTION CONTROL PROGRAM

NBWD needs to complete and adopt a cross connection control program. It is also advisable that NBWD staff obtain a BAT certification to improve internal control over the program.

CUSTOMER COMPLAINT RESPONSE PROGRAM

No deficiencies in the Customer Complaint Response Program have been identified.

SUMMARY OF O&M IMPROVEMENTS

- NBWD may need to increase staff as operational demands increase; however, installation of improved automated control at both wellfields and centralized monitoring and control at the NBWD office may alleviate need for additional staff.

- It would be beneficial to have NBWD staff with BAT certifications.

- NBWD may need to increase staff to complete more water main projects in house.

CHAPTER 7

DISTRIBUTION FACILITIES DESIGN AND CONSTRUCTION STANDARDS

OBJECTIVE

The objective of this chapter is to document the North Beach Water District's (NBWD's) design and construction standards to allow NBWD to obtain DOH approval to utilize the alternative review process for construction of new and replaced water distribution facilities. Through this process, a purveyor needs no further approval from DOH for distribution project reports, construction documents, or installation of distribution mains.

This chapter includes the following elements:

- System Standards, Policies and Procedures
- Project Review Procedures
- Policies and Requirements for Outside Parties
- Design Standards
- Construction Standards
- Construction Inspection Procedures

NBWD's *Standard Specifications for Water Main Construction* are located in Appendix E.

SYSTEM STANDARDS, POLICIES AND PROCEDURES

NBWD has developed the *Standard Specifications for Water Main Construction* to govern design and construction of all new and replacement water mains to be constructed by NBWD, or by private developers or property owners within the public right-of-way and/or public easements, and for all improvements intended for maintenance by NBWD.

PROJECT REVIEW PROCEDURES

PERMIT APPLICATION

All applications for line extension shall be submitted in writing to NBWD at least 90 days in advance of the proposed commencement date of construction. No construction will be authorized until such time as NBWD has approved the construction drawings. Each line extension application shall be accompanied by:

- A plot plan showing the location of all lots and details relating to the proposed construction. Written proof of right-of-way and/or easement

dedications shall be submitted with the plot plan unless explicitly waived by NBWD.

- Construction drawings showing: locations, sizes, and types of all mains, valves, hydrants, and fittings and exact distances from property lines, septic tanks, drain fields, storm drain facilities, paved areas and structures, typical sections, topography, and profiles (where required for plan interpretation) and miscellaneous typical details.

- An estimate of the cost of construction.

- A completed environmental checklist, when required by NBWD, on a form provided by NBWD.

- An agreement by the applicant to pay NBWD's cost and fees incurred in the course of reviewing and processing the line extension application, enforcing obligations of the line extension applicant and otherwise incurred as a result of the line extension application.

- Latecomer agreement proposal (if applicable).

APPLICATION REVIEW

Each application for a line extension will be reviewed initially to ascertain whether the proposed line extension application is complete. Complete applications wall be reviewed by the NBWD General Manager and NBWD Legal Counsel in order to determine whether the proposed project meets NBWD construction standards and will not impair NBWD's ability to provide full water service to its other customers, and by NBWD's SEPA official, who will determine if the proposed project complies with NBWD's SEPA guidelines.

Applications will then be forwarded to NBWD Board of Commissioners with recommendations. The Board will then consider the recommendations, make the necessary environmental determinations and either order the issuance of the applicant's line extension permit or reject the application. The issuance of a line extension permit may be made contingent upon any reasonable conditions.

APPROVAL OF PLANS

Proposed extensions of water mains shall be constructed and installed in accordance with plans prepared by a licensed civil engineer and such plans must be approved by NBWD's Engineer. All such extensions must be installed in accordance with the requirements of NBWD's Engineer. Construction and all other matters shall be approved by NBWD prior to construction.

POLICIES AND REQUIREMENTS FOR OUTSIDE PARTIES

EXTENSIONS – WHERE TO BE CONSTRUCTED

All extensions to the existing water mains, water service connections and customer service lines not located upon the premises to be served shall be constructed only upon public street or alleys or parcels where NBWD has recorded easements for such utility purposes. Proof that the applicant has secured required easements shall be delivered to NBWD prior to commencing construction.

PERFORMANCE BOND

The developer shall furnish to NBWD a surety bond in a form, and with a surety license to do business as a surety by the State of Washington and approved by NBWD and in an amount acceptable to NBWD, which bond shall guarantee the faithful performance of the work on the line extension, payment of all individuals or entities, including state and municipal entities and agencies, who are empowered to create a lien upon the line extension for nonpayment of obligations to those individuals or entities and the replacement of all defective material and workmanship within one year after acceptance of the line extension by NBWD. In some cases, a 2-year bond may be required because of County rules on road restoration.

AGREEMENT

The developer shall sign an agreement, on a form approved by NBWD, to indemnify, defend and hold harmless NBWD from any and all liability for damages arising from acts done during or in the preparation for construction of the line extension.

PROOF OF INSURANCE

The developer shall submit proof of the applicant's comprehensive general and automobile liability and property damage insurance, before commencing work, in limits of $5,000,000 bodily injury including death, and $1,000,000 property damage protecting against all claims for personal injury or collapse or explosion damage, arising during or in preparation for construction of line extension.

COSTS AND INSPECTION DEPOSIT

Persons obtaining extensions of NBWD water mains shall pay NBWD's engineering costs incurred in reviewing the plans, consultations regarding NBWD's requirement, inspection of the work and administration of the extension of the utility system. An inspection and engineering fee deposit shall be paid to NBWD at the time application for the extension is made. The deposit shall be as calculated by the NBWD General Manager.

Before NBWD will accept the completed extension, the applicant shall pay all NBWD costs that exceed the engineering and inspection fee deposit, and if NBWD's actual costs are less than the deposit, the differences will be refunded to the applicant.

LINE EXTENSION CONSTRUCTION

Upon receipt of NBWD's line extension permit, the applicant may commence construction of the proposed line extension. In addition to being subject to any conditions placed upon the line extension permit, construction of the line extension shall be subject to the following conditions:

- The applicant shall be responsible for paying all costs of the line extension.
- The applicant shall procure and pay for all permits, licenses, easements, environmental notices, reports, impact statements and for the review thereof, shoreline permits, railroad and highway crossing permits and other permits or exemptions necessary for construction of the line extension.
- All taps of a line to an existing NBWD main shall be made by NBWD crews or under direct supervision of NBWD personnel, with material supplied by the owner, contractor or NBWD. Payment must be made in advance for this work and for any material required, if done by NBWD, unless prior financial arrangements have been made with NBWD.
- All trenches shall be inspected for proper bedding and pipe installation prior to back filling. No exceptions will be allowed.
- A hydrostatic test shall be made by the applicant under the supervision of NBWD.
- NBWD will obtain water samples after the line has been sanitized by the contractor and send them to an appropriate health department agency for testing.
- The procedures and acceptance criteria used for sanitizing the line, pressure testing the line and water testing shall conform to state and NBWD standards.

EXTENSION TO BE COMPLETED WITHIN 1 YEAR

The extension shall be complete and offered for acceptance within one year of the date for approval of the application. If the extension is not completed and offered for acceptance within 1 year from the date of approval, the applicant's rights shall cease and

they shall make new or amended application and pay the additional administrative, legal, engineering, and inspection costs.

NBWD COSTS TO BE BORNE BY DEVELOPER

Any costs reasonably incurred by NBWD for legal services, accounting services and other services incident to the receipt, study and approval or rejection of this application shall be borne by the developer, and the developer agrees to pay such costs within thirty days of billing by NBWD. If legal proceedings are instituted to enforce any provision of this agreement, the applicant will pay a reasonable attorney's fee to NBWD.

DESIGN STANDARDS (PERFORMANCE STANDARDS AND SIZING CRITERIA)

NBWD has adopted the *Standard Specifications for Road, Bridge, and Municipal Construction* by the Washington State Department of Transportation and the American Public Works Association as a standard specification and modified it as required to meet NBWD requirements. This section is a summary of the standards used by NBWD for its water system. Also presented in NBWD's Standard Drawings and Specifications are standard detail drawing for components such as hydrants, valves, and pipe installations located in Appendix E.

WATER MAINS

Main Sizing. Water mains shall be sized to provide adequate domestic and fire flows at the required residual pressure. Fire flow minimum requirements are ultimately determined by the Pacific County Fire Marshal or Peninsula Fire District No. 1, and may be modified based upon an approved fire sprinkler plan for the development.

NBWD shall be consulted as to the size of the water main. In general, the minimum size main that will be allowed to serve the development is 6-inch diameter, unless otherwise approved. Larger size mains are required in specific areas outlined in the Water System Plan. Nothing shall preclude NBWD from requiring the installation of a larger sized main in areas not addressed in the Plan, if NBWD determines that a larger size is needed to meet fire protection requirements or for future service.

Dead-end mains shall not be permitted unless specifically approved, and the distribution system to a development shall be interconnected so that pressures throughout the system will tend to become equalized under varying rates and locations of demand. If a dead-end main is approved by NBWD, the main shall be extended to the farthest boundary of the development and a valved 2-inch diameter minimum blowoff shall be provided. It is not the intent to set arbitrary standards with regard to pipe sizes and layout; therefore, in special situations where it can be shown that domestic supply requirements and fire protection requirements can be met at existing and anticipated future pressures, NBWD will consider each design on its individual merits.

For commercial, multi-family, and industrial application the minimum main size shall be an 8-inch-diameter loop and 12-inch-diameter dead ends are as required based on fire flow demands.

SERVICE SIZING

Service sizing is based on peak flow rate:

- Single-Family Residential – 2.0 gpm/service
- Multi-Family Residential – 1.0 gpm/service
- Commercial: by facility – Generally low impact
- Industrial: by facility – Generally low impact unless water used in an industrial process
- Irrigation: by system capacity – Significant users schedule for off-peak usage of water

FIRE FLOW

Fire flow depends on land use category:

- Minimum Single-Family Residential –500 gpm at 20 psi
- Multi-Family Residential/Commercial/Industrial – 750 gpm at 20 psi

SYSTEM PRESSURES

Recommended Domestic – Minimum 30 psi; Maximum 90 psi. NBWD recommends that customers install Pressure Reducing Valves (PRV) on private lines where necessary. The Uniform Plumbing Code requires PRVs for pressures above 80 psi.

Fire Flow Pressure Minimum is 20 psi.

Normal operating pressures of not less than 40 psi nor more than 90 psi should be maintained at service connections to the distribution system, except that during periods of maximum day plus fire flow demand, the pressure shall be not less than 20 psi.

CONSTRUCTION STANDARDS (MATERIALS AND METHODS)

Specifications and standard drawings for water main extensions were prepared for NBWD as part of the current planning effort. Copies of the *Standard Specifications for Water Main Construction* are included in Appendix E.

CONSTRUCTION CERTIFICATION AND FOLLOW-UP PROCEDURES

ACCEPTANCE OF LINE EXTENSION

Upon certification of completion of the line extension construction by the NBWD engineer, the applicant shall convey and transfer to NBWD on forms approved by NBWD, including but not limited to, warranty bill of sale, the line extension and all easements, permits and rights necessary to run, operate and maintain the line extension.

The line extension will not be accepted by NBWD until:

- Receipts of all material used, labor utilized and the cost thereof are provided NBWD along with receipts indicating the payment of those costs.
- "As Built" drawings are provided to NBWD.
- The posting of surety for maintenance for a term of 1 year.

Upon acceptance of the line extension, NBWD will assume ownership of the line extension and the responsibility for its operation and maintenance.

CHAPTER 8

IMPROVEMENT PROGRAM

OBJECTIVE

The objective of this chapter is to present the North Beach Water District Improvement Program, which is composed of projects identified in the previous chapters. These improvements are assessed and prioritized for implementation over 6- and 20-year planning periods. The Improvement Program has been developed in conjunction with the financial capabilities and recommendations presented in Chapter 9, Financial Program.

The chapter includes capital improvement projects for source of supply, pumping, distribution, control system, and other identified capital and non-capital improvements. The chapter provides an assessment of alternatives where appropriate including a cost analysis, identifies the preferred alternatives for each project, recommends a schedule for the improvements, and identifies available funding sources.

IDENTIFICATION OF SYSTEM IMPROVEMENTS

Water system deficiencies identified in previous chapters are summarized in the following sections, together with evaluations of alternatives and planning level cost estimates. Details of planning level cost estimates are included in Appendix J.

CAPITAL IMPROVEMENTS

This section addresses Capital Improvements, or improvements to physical facilities. Improvements to operations, management or planning are addressed in the following section titled *Non-Capital Improvements*.

SOURCE IMPROVEMENTS

S-01A: South Well Field Improvements

As discussed in Chapters 1, 3 and 5, NBWD has drilled and tested three new wells near the South Well Field. This project is funded by a Drinking Water State Revolving Fund (DWSRF) loan (DWSRF Loan No. DM12-952-129). The three new wells are identified by the District as the Wiegardt Wells 1, 2 and 3. While these wells are less than 1,000 feet from the existing South Well Field Wells and completed in the same aquifer[1], they are located in a different quarter-quarter section, and therefore, require approval

[1] See report "North Beach Water District Construction and Testing of Wiegardt Wellfield" by Robinson Noble (June, 2014)

from Ecology as new "points of withdrawal" on the District's Water Right Certificate. A Water Right Change Application has been submitted to Ecology by NBWD. NBWD will submit a Project Report and Construction Documents for the Wiegardt Wells to DOH for approval, pending Ecology approval of the Water Rights Change request.

The project will consist of installation of pitless well units, pumps, and water level sounding equipment in the new Wiegardt Wells, extension of power supply, control and power switching equipment to the Wiegardt well site, construction of water mains, flow meters, and valves to transmit output from these wells to the existing SWF water treatment building, replacement of existing treatment facilities with new water treatment facilities, and improvements in the telemetry and control system for all facilities at the South Wellfield Site. The estimated cost for these improvements is $1,900,000. Of this total, NBWD has spent approximately $320,000 in drilling and testing the wells and completing preliminary design activities, with approximately $1,500,000 remaining to complete this project.

S-01B: North Wellfield Improvements

This project is funded by the same DWSRF loan as project S-01A (DWSRF Loan No. DM12-952-129). The NBWD intends to rehabilitate its North Wellfield Treatment facilities. The existing ozone feed systems will be replaced with an air feed system for oxidation. The existing polymer feed system will be removed. The existing electrical and controls systems will be replaced. The existing water piping will be reconfigured to allow all wells to be treated by all filters. The existing treatment building will be insulated and HVAC systems will be improved. A new backwash basin will be constructed and the site will be fenced. If funds are available, the existing wellhouses will be replaced with pitless well adapters and Well 6 will be redrilled. The control system will be tied to a new SCADA system to be located at the NBWD main office so that facilities at both the NWF and the SWF can be monitored and controlled from the main NBWD office, and so that coordination between the NWF and SWF booster pump facilities can be improved. The estimated cost for these improvements is $500,000.

CONTROL IMPROVEMENTS

The existing control systems for both the NWF and SWF sites are currently not working. A new control system will be installed to turn wells on and off based on reservoir levels, to turn booster pump on and off based on system pressure and flow, to coordinate the NWF and SWF booster pump stations, and to monitor system conditions and adjust system settings from the main NBWD office. These improvements are included in projects S-01A and S-01B described above.

PUMPING IMPROVEMENTS

P-01: Booster Pump Station at Birch Place and 227th Street

A booster pump station will be installed to improve system hydraulics, specifically to meet the District's minimum fire flow standard[2] of 500 gpm for 30 minutes for the Sunset Sands subdivision on Birch Avenue south of 227th Street. The station is anticipated to consist of low flow and high flow pumps operated by local pressure and flow sensors. The estimated cost for this project is $250,000.

SERVICE METERING

M-01: Install AMR Service Meter System

The NBWD system is already completely metered. However, many of the meters are approaching or beyond their useful life expectancy, and NBWD is moving toward a fully automated meter reading system. New water billing and water accounting software is included with the automated meter reading system. This will greatly improve NBWD's ability to track and account for water use as well as ensure timely and equitable water use billing. The cost of completing automated meter replacement is estimated at $525,000.

DISTRIBUTION SYSTEM SAMPLE STATIONS

D-04: Distribution System Sample Stations

NBWD intends to install 20 new distribution system sample stations over the next five years. The total cost for the 20 sample station is estimated at $45,000. At an average of four new sample stations per year this is an estimated $9,000 per year. This is identified a Projects D-04A, B, C, D and E

WATER DISTRIBUTION SYSTEM IMPROVEMENTS

Water Main Replacement Program

Distribution system deficiencies were identified in Chapter 3. In general, it is recommended that NBWD begin a water main replacement program to maintain a manageable overall water distribution system age. The American Water Works Association (AWWA) reports the "typical" useful service life of pipes in a water distribution system inventory may vary widely, depending on pipe materials, water characteristics, soil characteristics, water main installation methods and materials, water main maintenance and repair practices, and other factors, a water main life expectancy of 65 to 85 years is reasonable[3]. The oldest parts of the system are approaching 60 years in

[2] WAC 246-293-640 "Minimum Standards for Fire Flow"
[3] AWWA "Buried No Longer: Confronting America's Water Infrastructure Challenge" (2011)

age now. If NBWD begins a water main replacement program based on a 60- to 85-year replacement schedule, NBWD should be able to keep the water distribution system in good condition.

All water main replacements, no matter the reason for the replacement, constitute the water mains replacement program. Water main replacements are to be scheduled based on water main replacement priorities. Existing system flow capacity deficiencies and existing failing water mains are the highest priorities. If all distribution system deficiencies have been addressed, the next priorities would be water distribution system age.

Based on Table 1-5, the water system has an estimated total of 296,400 feet (56.14 miles) of water mains. The cost to replace the entire water distribution system is estimated at $30 million[4]. Divided evenly amongst 2,684[5] customers, this is an estimated $11,177 per customer. To replace the entire distribution system on a 60- to 85-year replacement schedule would require replacement of an average of 3,487 feet (0.66 mile) to 4,940 feet (0.94 mile) per year, at an estimated annual cost of between $354,000 and per year on an 85-year replacement schedule, to $500,000 per year on a 60-year replacement schedule, based on 2014 dollars. Divided evenly amongst 2,684 customers, this is an estimated $131 (85-year replacement schedule) to $186 (60-year replacement schedule) per customer per year.

The above cost estimates are based on the cost of contracting the water main replacement to general contractors at Davis-Bacon prevailing wages. NBWD is planning on developing the institutional capacity to install water main "in-house" at a reduced cost to that of a general contractor. The actual cost for NBWD to replace water mains is not known at this time, and the only practical way to know the cost is to do water main replacement construction and keep track of costs. Therefore, rather than set an annual budget for water main replacement, the NBWD Board prefers to set an annual goal of 3,500 to 5,000 feet per year of water main replacement. NBWD will set aside an annual budget for water main replacement, review progress on an annual basis, and adjust the budget each year in an effort to reach and maintain an acceptable goal.

In addition to annual water main replacement projects, specific water distribution system improvements are as follows:

D-01: 245th Lane from U Street to Birch Place

This would be an 8-inch water main, completing a loop between State Route (SR) 103 and Birch Place, with tie-ins to several 2-inch and 4-inch water mains. This project is to

[4] DWSRF Project DM12-952-121 was completed in 2014 at a cost of $498,000 for the installation of 5,060 feet of 2,275 feet of 6-inch water main, 1,305 feet of 8-inch water main, and 1,480 feet of 12-inch water main.
[5] NBWD had 2,684 active service connections as of November 2014.

improve system hydraulics, water circulation and reliability by adding a new loop to the distribution system. Estimated cost is $223,000.

D-02: Install Fire Hydrant at SR 103 and 179th

This location is the southern-most end of the water system on SR 103 at t his time. Installation of a fire hydrant at this location will improve fire protection in the area and improve the ability to flush the water main for maintenance purposes. Estimated cost is $12,000.

D-03: Relocate Water Service for "Free by the Sea," West End of 256th

The existing water main, water service and fire hydrant are located on private property across a privately owned bridge in a private driveway. Relocating the service to the public right of way will improve the ability of NBWD to maintain this large water service. Estimated cost is $30,000.

D-04: Install 20 new water system sampling stations

This is discussed previously under the heading Distribution System Sample Stations. Cost is estimated at $45,000 and distributed over 5 years at $9,000 per year.

D-05: Water Main on Ash Place and Birch Place from 250th Street to 240th Place

Replace Approximately 1,900 Feet of 6-inch water main that currently goes through private property behind homes on Birch Avenue with new 8-inch water main locate in the public right-of-way. This will improve hydraulic capacity to the water service area south on Birch Place and improve the ability to service and maintain the water main by getting it off from private property and on to public right-of-way. Estimated cost is $338,000.

D-06: Tides West Division 1 and Jolly Roger Subdivisions

Replace existing 2-inch water mains in Tides West Division 1 and Jolly Roger subdivisions, west of SR 103 in the vicinity of 194th Street to 197th Street, with approximately 4,650 feet of new 6-inch water main. This will improve pressure, fire flow and water circulation within the Tides West Division 1 and Jolly Roger subdivisions. Estimated cost is $490,000.

D-07: Tides West Division 2 and Sea Lake Ranch Subdivisions

Replace existing 2-inch water mains in Tides West Division 2 and Sea Lake Ranch subdivisions, east of SR 103 in the vicinity of 194th Street to 196th Street, with approximately 4,770 feet of 6-inch water main. This will improve pressure, fire flow and water circulation within the Tides West Division 2 and Sea Lake Ranch subdivisions. Estimated cost is $480,000.

D-08: Vernon Avenue from 276th Place to Joe John's Road

Install approximately 3,500 feet of 8-inch water main on Vernon Avenue from 276th Place to Joe John's Road. This will extend water service availability north to Joe Johns Road, begin several planned distribution system loops to the north, and bring the system closer to a possible future intertie with Surfside HOA water system. Estimated cost is $390,000.

D-09: Joe John's Road and U Street to 270th Street

Install approximately 6,650 feet of 8-inch water main on Joe John's Road from Vernon Avenue to U Street, and on U Street to 270th Street. This will complete the first of two major water distribution system loops to the north of the current service area. Estimated cost is $650,000.

D-10: Joe John's Road and Sandridge Road to 275th Street

Install approximately 8,100 feet of 8-inch water main on Joe John's Road from U Street to Sandridge Road, and on Sandridge Road to existing 8-inch water main at 275th Street. Completes the second of two major distribution system loops to the north of the current service area. Estimated cost is $750,000.

D-11: Sandridge Road from Bay Avenue to 277th

Install approximately 12,640 feet of 8-inch water main on Sandridge Road from Bay Avenue to 227th Place and on 227th Place from Sandridge Road to Birch Place, and 250th from Sandridge Road to Ash Place. This project will complete several water main loops to support water service to the south, improving distribution system pressure, fire flow, circulation and reliability to existing and future services in the central and south portions of the existing and future service areas. Estimated cost is $1,100,000

D-12: U Street from 253rd Street to 227th Street

Install approximately 7,380 feet of 8-inch water main on U Street from 253rd Place to 227th Place. This project will complete several water main loops and support water service to the south, improving distribution system pressure, fire flow, circulation and reliability to existing and future services in the south portions of the existing and future service areas. Estimated cost is $620,000

D-13: 253rd Street from U Street to Y Street

Install approximately 1,180 feet of 6-inch water main on 253rd Place from U Street to Y Street. This project will improve water transmission capacity from the South Wellfield to the distribution system. Estimated cost is $165,000

WATER LOSS CONTROL ACTION PLAN

Assess Data Accuracy, and Data Collection Methods and Errors

As shown in Table 2-6, NBWD has exceeded the ten percent DSL standard for each of the past 4 years. The 3-year average DSL from 2011 through 2013 was 17.4 percent. As discussed in Chapter 4, water systems that exceed the DSL standard of ten percent must develop a Water Loss Control Action Plan (WLCAP). For systems with 10 to 20 percent DSL, the WLCAP must include the following elements:

1. Assess data accuracy.

2. Assess data collection methods and errors.

As described earlier in this chapter, NBWD is in the process of installing automatic read (AMR) water service meters. The AMR system comes with new water accounting and billing software. It is anticipated that the new AMR system and the new accounting software will improve water data accuracy as well as improve data collection and reduce errors. Installing AMR service meters is described in project M-01.

In addition, as discussed in Chapter 4, a significant amount of DSL may be caused by overflowing reservoirs due to lack of automatic well shutoff when reservoirs are full. The new control system that will be installed in conjunction with project S-01 will automate reservoir water level control and greatly reduce the incidence of reservoir overflow, thereby reducing DSL rates.

CONSTRUCTION EQUIPMENT

It is North Beach Water District's goal to replace and install their own water mains with in-house labor. To do so, NBWD will need to obtain construction equipment as part of the institutional capacity required to accomplish that goal. Items of equipment that that NBWD intends to acquire, together with estimated costs of the equipment are as follows:

Cat 304E CR Mini Excavator (or equal) 2,000 or less hrs. $50,000

Bobcat S750 (or equal) Skid Steer.....$40,000

Freightliner FL60 (or equal) 5 yard dump, 5 years old or less $50,000

Load Trail CC14 102" x 16' (down rated to 10,000 lbs).....$12,000

Compactors, Tools, Safety equipment, Misc. $10,000

Total Equipment.....$162,000

CAPITAL IMPROVEMENT SCHEDULE

Capital improvements discussed above have been prioritized and scheduled to allow for a reasonable annual capital improvement cost and manageable annual capital improvement project load. The resultant 6-year and 20-year capital improvements are discussed in the following sections.

6-Year Capital Improvement Schedule

Capital improvements identified above are indicated on Figure 8-1, Capital Improvement Map. A 6-year overall capital improvement schedule is summarized in Table 8-1. A twenty-year capital improvement list is included in Table 8-2. The total estimated cost of all recommended capital improvements in the 6-year capital improvement schedule is $4.37 million. Project S-01 is funded by a DWSRF loan. NBWD will apply for additional loans and grants to fund other projects as well. However, for budgeting purposes it will be assumed that all other projects will be paid from water sales revenues.

TABLE 8-1

6-Year Capital Improvement Schedule

Project No.	Description	Purpose	Cost Estimate	Year
M-01	AMR Meter Replacement	Replace approximately 1,500 water service meters with AMR meters.	$525,000	2015
S-01A	South Well Field Improvements	Equip new Wiegardt Wells 1, 2 and 3, install flow meters and transmission piping, replace treatment system, replace control system, install new SCADA system.	$1,500,000	2015
D-02	Install fire hydrant at SR 103 and 179th	Provide fire flow and flushing capability at south end of system.	$12,000	2016
D-03	Relocate water service for "Free by the Sea," West end of 256th	Place hydrant and meter in public access area.	$30,000	2016
D-04A	Add 3-4 additional distribution system sample stations	Improve ability to monitor water quality in distribution system.	$9,000	2016
E-01	Construction Equipment	Acquire an excavator, dump truck, trailer, and miscellaneous tools for construction of water mains.	$162,000	2016

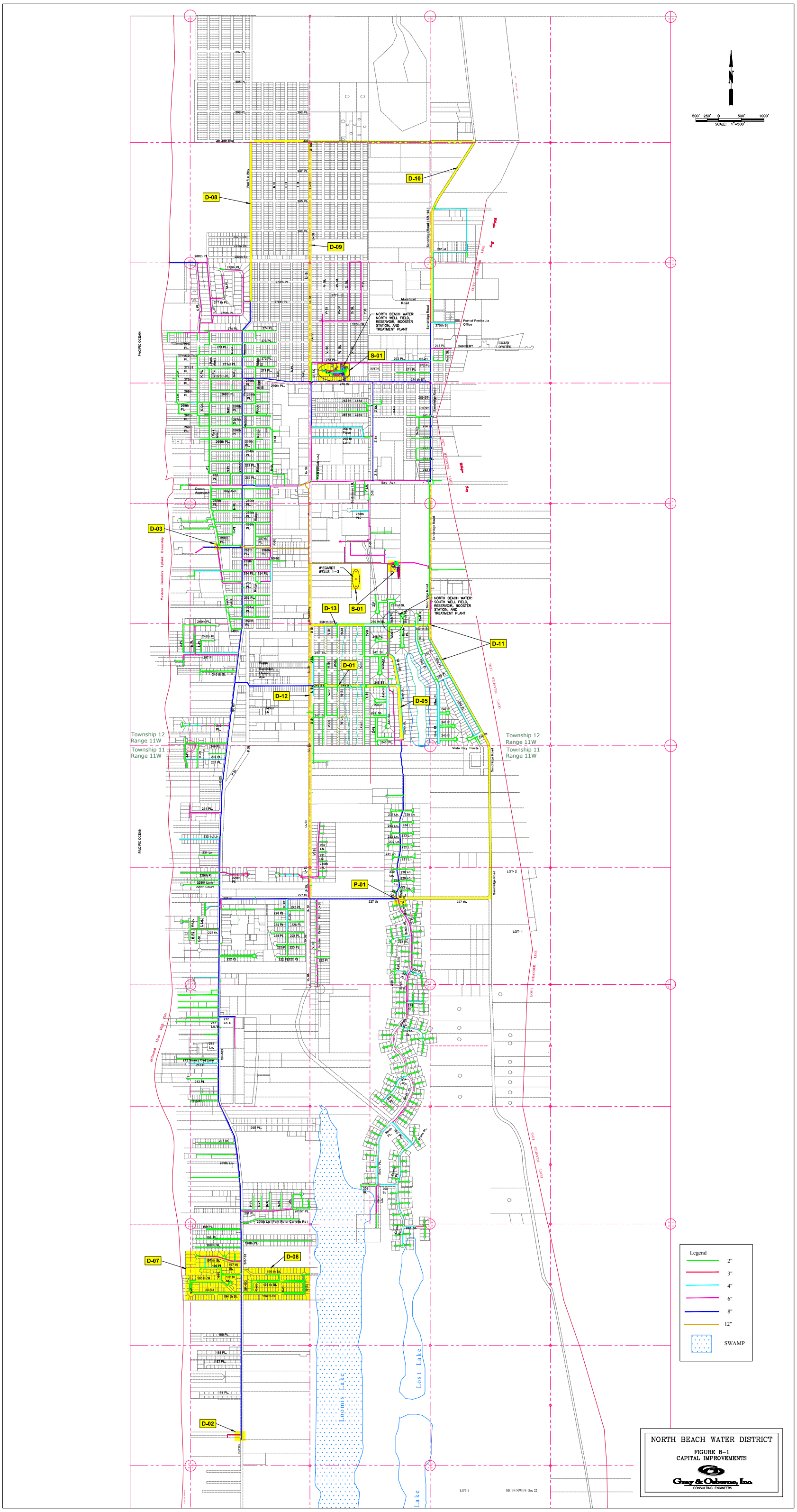
D-08
D-10
D-09
D-03
D-13
S-01
D-11
D-01
D-12
D-05
P-01
D-07
D-02
NORTH BEACH WATER: NORTH WELL FIELD, RESERVOIR, BOOSTER STATION, AND TREATMENT PLANT
NORTH BEACH WATER: SOUTH WELL FIELD, RESERVOIR, BOOSTER STATION, AND TREATMENT PLANT
WIEGARDT WELLS 1-3
Township 12 Range 11W
Township 11 Range 11W
PACIFIC OCEAN
Sandridge Road
Port of Peninsula Office
CANNERY
COAST OYSTER
Loomis Lake
Lost Lake
GOVT MEANDER LINE
LOT-1
LOT-2
500' 250' 0 500' 1000'
SCALE: 1"=500'
Legend
2"
3"
4"
6"
8"
12"
SWAMP
NORTH BEACH WATER DISTRICT
FIGURE 8-1
CAPITAL IMPROVEMENTS
Gray & Osborne, Inc.
CONSULTING ENGINEERS

TABLE 8-1 – (continued)

6-Year Capital Improvement Schedule

Project No.	Description	Purpose	Cost Estimate	Year
S-01B	North Well Field Improvements	Rehabilitate North Well Field, improve piping and treatment system, replace existing electrical and controls, construct new backwash basin, improve treatment building, tie to new SCADA system.	$500,000	2016
D-04B	Add 3-4 additional distribution system sample stations	Improve ability to monitor water quality in distribution system.	$9,000	2017
D-13	Approx. 1,180 feet of 6-inch water main on 253rd Place from U Street to Y Street.	Improve water transmission capacity from the South Wellfield to the distribution system.	$165,000	2017
P-01	New booster pumping system at Birch Place and 227th Avenue	Improve pressure and fire flow capacity to Sunset Sands subdivision on Birch Place south of 227th Place	$250,000	2017
D-01	Approx 1,900 feet of 8-inch water main on 245th Lane from U Street to Birch Place	Replaces existing 2-inch water main and creates new water system loop.	$223,000	2018
D-04C	Add 3-4 additional distribution system sample stations	Improve ability to monitor water quality in distribution system.	$9,000	2018
D-05	Approx 3,800 feet of 8-inch water main on Ash Place and Birch Place from existing 12-inch water main at South Wellfield to 240th Place	Replaces existing 6-inch water main that routes behind houses in private easements. Improves flow capacity, water main accessibility, and water meter accessibility.	$338,000	2018
D-04D	Add 3-4 additional distribution system sample stations	Improve ability to monitor water quality in distribution system.	$9,000	2019
D-12A	Approx. half of 7,380 feet of 8-inch water main on U Street from 253rd Place to 227th Place.	Complete several water main loops and support water service to the south, improving distribution system pressure, fire flow, circulation and reliability.	$310,000	2019

TABLE 8-1 – (continued)

6-Year Capital Improvement Schedule

Project No.	Description	Purpose	Cost Estimate	Year
D-04E	Add 3-4 additional distribution system sample stations	Improve ability to monitor water quality in distribution system.	$9,000	2020
D-12B	Approx. half of 7,380 feet of 8-inch water main on U Street from 253rd Place to 227th Place.	Complete several water main loops and support water service to the south, improving distribution system pressure, fire flow, circulation and reliability.	$310,000	2020
Total 6-Year Capital Improvements			**$4,370,000**	

At 2,684 active service connections, the cost of the total recommended 6-year capital improvements constitutes a cost of $1,628 per existing service connection, which is $271 per year or approximately $23 per month per existing service. Some of these costs may be paid by developers, some may be paid by connections fees, and project S-01 is paid with a DWSRF low interest loan with a 20-year payback period. Also, the number of water services is likely to increase as water mains are extended into new areas. Therefore, the impact of capital improvements per customer is likely to be less than $23 per month.

Based on Table 8-1, annual total capital improvements over the 6-year planning horizon are shown in Table 8-2.

TABLE 8-2

Annual Total 6-Year Capital Improvements

Year	DWSRF Loan	Other Funding	Annual Total CIP
2015	$1,500,000	$525,000	$2,025,000
2016	$500,000	$213,000	$713,000
2017		$425,000	$424,000
2018		$570,000	$570,000
2019		$319,000	$319,000
2020		$319,000	$319,000
Total 6-Year CIP	$2,000,000	$2,370,000	$4,370,000

20-Year Capital Improvements

Capital improvements identified in this plan that are not included within the 6-year capital improvement schedule are listed in the 20-year capital improvements in Table 8-3. The total of 20-year capital improvements is $3.86 million

TABLE 8-3

20-Year Capital Improvements

Project No.	Description	Purpose	Cost Estimate
D-06	Approx 4,650 feet of 6-inch water mains in Tides West Div 1 and Jolly Roger subdivisions west of SR 103.	Replace existing 2-inch water mains.	$490,000
D-07	Approx 4,770 feet of 6-inch water main in Tides West Div 2 and Sea Lake Ranch subdivisions east of SR 103.	Replace existing 2-inch water mains.	$480,000
D-08	Approx 3,500 feet of 8-inch water main on Vernon Ave. from 276th Place to Joe John's Road	Beginning of two system loops to the north	$390,000
D-09	Approx 6,650 feet of 8-inch water main on Joe John's Road from Vernon Ave. to U Street, and on U Street to 270th Street.	Completion of first system loop to the north.	$650,000
D-10	Approx 8,100 feet of 8-inch water main on Joe John's Road from U Street to Sandridge Road and on Sandridge Road to existing 8-inch water main at 275th Street.	Completion of second system loop to the north.	$750,000
D-11	Approx 12,640 feet of 8-inch water main on Sandridge Road from Bay Ave to 227th Place and on 227th Place from Sandridge Road to Birch Place, and 250th from Sandridge Road to Ash Place.	Create major new system loop, improve hydraulics to south end of service area.	$1,100,000
Total 20-Year Capital Improvements			$3,860,000

NON-CAPITAL IMPROVEMENTS

There are system needs identified in earlier chapters of this plan that are not capital facilities improvements, but are needed to meet regulatory requirements for water conservation, source protection, planning and for system operations. These improvements are summarized below.

WATER USE EFFICIENCY MEASURES

E-01: Water Use Efficiency Program Promotion

Water use efficiency program promotion is an ongoing effort for NBWD. Regular distribution of water conservation guidelines and publication of articles promoting conservation through the NBWD newsletter will continue. The estimated cost for

program promotion, including printing, handling, and postage costs, is estimated at $4,000 per year.

WELLHEAD PROTECTION MEASURES

W-01: Distribute Notifications

Wellhead protection regulations require that owners of potential sources of contamination within the wellhead protection areas (WHPAs) be notified of the fact that the WHPA encompasses their facility, and advised that any contamination that might originate from their site has a potential to contaminate the community's drinking water supply. The letters should contain a brief explanation of the wellhead protection program and a map showing the WHPA. Based on the analysis in Chapter 5, notices need to be sent to the eleven facilities shown in Table 5-2. It is advisable also to distribute copies of the wellhead protection maps to all property owners within WHPA, advising that disposal of inappropriate substances to septic systems within the WHPA could contaminate the NBWD water supply. In addition, notices must be provided to regulatory agencies and local government with permitting authority in the wellhead protection areas, and to emergency incident responders responsible for response in the wellhead protection areas. It is estimated that about half of the 2,684 NBWD customers are in the WHPA, including those listed in Table 5-2. Regulatory agencies and emergency responders account for maybe a dozen more notifications. Based on this estimate, approximately 1,350 notices will need to be sent out. At an estimated three dollars per mailing, WHPA notifications would cost NBWD and estimated $4,000.

OPERATIONS MEASURES

Certain measures have been recommended in Chapter 6 of this Plan, Operation and Maintenance. These recommendations are summarized in the following.

O-01: Operations Staffing

Adjust Staff Levels as Needed to Meet Operations Demands: Operations staffing appears to be adequate at this time. However, as NBWD continues to grow and as NBWD continues to take on more tasks to be completed by NBWD staff, including water main construction, it will be necessary to add staff as needed to maintain an adequate staffing level. If NBWD adds two additional positions for water main construction, the additional cost for wages plus overhead is estimated at $60,000 per year per additional full time employee, for a potential total in additional cost of $120,000 per year. Note, however, that the cost of the added staffing is already calculated into the Capital Improvements estimates so this estimate will not be added to the Non-Capital Improvements matrix as it will result in a double budgeting of the a significant part of the labor for the Capital Improvement Projects.

O-02: Cross-Connection Control Certification

Get Staff Certified for Backflow Assembly Testing (BAT): Currently no staff are certified to test backflow prevention assemblies so this must be contracted out to a certified BAT from outside NBWD employment. Having this certification available from NBWD staff would be beneficial to NBWD. It is estimated that training for a staff member to obtain a BAT certification would be $3,500. The certified BAT will also need refresher courses to maintain the BAT certification, at an estimated $2,000 per year. So the total cost of obtaining a BAT certified staff member is estimated at an initial cost of $3,500 plus an annual cost of $2,000 per year.

PLANNING MEASURES

P-01: Water System Plan

Update Water System Plan: This water system plan will be due for update in 6 years. The estimated cost for a water system plan update is $50,000.

P-02: Rate Study

NBWD is completing a rate study concurrently with this Water System Plan update, and plans to update the rate study concurrently with the next water system plan update in 2020. The cost for a rate study update is estimated at $30,000.

SUMMARY OF NON-CAPITAL IMPROVEMENTS

Non-Capital Improvements are summarized in Table 8-4. The estimated total of Non-Capital Improvements is $118,500. At 2,684 service connections, this is a cost of $44.15 per connection, which is $7.36 per connection per year. It is planned that all non-capital improvements will be funded by NBWD through assessments and rates.

TABLE 8-4

Non-Capital Improvement Schedule

Project No.	Project Title	Type Of Improvement	Description	Cost Estimate	Year
E-01	Water Use Efficiency Program Promotion	Water Use Efficiency	Distribute WUE Program Promotion Literature	$4,000	2015
W-01	Wellhead Protection Notifications	Wellhead Protection	Distribute Notifications of Wellhead Protection Areas	$4,000	2015
O-02	BAT Certification	Operations	Cross-Connection Control	$3,500	2016

TABLE 8-4 – (continued)

Non-Capital Improvement Schedule

Project No.	Project Title	Type Of Improvement	Description	Cost Estimate	Year
E-01	Water Use Efficiency Program Promotion	Water Use Efficiency	Distribute WUE Program Promotion Literature	$3,000	2016
O-02	BAT Certification	Operations	Cross Connection Control	$2,000	2017
E-01	Water Use Efficiency Program Promotion	Water Use Efficiency	Distribute WUE Program Promotion Literature	$4,000	2017
O-02	BAT Certification	Operations	Cross Connection Control	$2,000	2018
E-01	Water Use Efficiency Program Promotion	Water Use Efficiency	Distribute WUE Program Promotion Literature	$4,000	2018
O-02	BAT Certification	Operations	Cross Connection Control	$2,000	2019
E-01	Water Use Efficiency Program Promotion	Water Use Efficiency	Distribute WUE Program Promotion Literature	$4,000	2019
O-02	BAT Certification	Operations	Cross Connection Control	$2,000	2020
P-01	Water System Plan	Planning	Update Water System Plan	$50,000	2020
P-02	Rate Study	Planning	Update Water Rates	$30,000	2020
E-01	Water Use Efficiency Program Promotion	Water Use Efficiency	Distribute WUE Program Promotion Literature	$4,000	2020
Total Non-Capital Improvements				**$118,500**	

Annual total Capital and Non-Capital Improvements are summarized in Table 8-5. The total estimated cost of all recommended six-year Capital and Non-Capital improvements is $4,488,500.

TABLE 8-5

Annual Total Capital and Non-Capital Improvements

Year	Annual Total NCIP	Annual Total CIP	Annual Total Improvements
2015	$8,000	$2,025,000	$2,033,000
2016	$6,500	$713,000	$719,500
2017	$6,000	$424,000	$430,000
2018	$6,000	$570,000	$576,000
2019	$6,000	$319,000	$325,000
2020	$86,000	$319,000	$405,000
6-Year Total	$118,500	$4,370,000	$4,488,500

CHAPTER 9

FINANCIAL PLAN

INTRODUCTION

This chapter was prepared by FCS GROUP to provide a financial program that allows the water utility to remain financially viable during the planning period. This financial viability analysis considers the historical financial condition, current and identified future financial and policy obligations, operation and maintenance needs, and the ability to support the financial impact related to the completion of the capital projects identified in this Water System Plan (WSP). Furthermore, this chapter provides a review of the utility's current rate structure with respect to rate adequacy, promotion of water conservation, and customer affordability. Appendix K presents backup documentation related to this financial plan.

PAST FINANCIAL PERFORMANCE

This section includes an historical summary of financial performance as reported by the District on the fund resources and uses arising from cash transactions, which are useful indicators of the financial position of the District.

COMPARATIVE FINANCIAL STATEMENTS

The District legally owns and operates a water utility fund. Table 9-1 shows a summary of fund resources and uses arising from cash transactions for the District for the previous five years (2009 through 2013). Generally a summary of operating income and expenses for the last 6 years is recommended, however, the District was incorporated on January 1, 2009 and there is no data available prior to this date. Noteworthy findings and trends are discussed to demonstrate the historical performance and condition of the District.

TABLE 9-1

Summary of Historical Fund Resources and Uses Arising from Cash Transactions

	2009	2010	2011	2012	2013
Beginning Cash and Investments	**$170,550**	**$188,427**	**-**	**-**	**-**
Reserved	-	-	81,329	661,208	-
Unreserved	-	-	131,715	331,965	1,310,846
Revenues and Other Sources					
Charges for Goods and Services	1,229,910	1,357,149	1,486,492	1,611,030	1,673,046
Miscellaneous	3,948	14,437	3,771	3,973	4,010
Other Financing Sources	410,364	410,364	412,317	1,178,304	-

TABLE 9-1 – (continued)

Summary of Historical Fund Resources and Uses Arising from Cash Transactions

	2009	2010	2011	2012	2013
Total Revenues and Other Financing Sources	**1,644,222**	**1,781,950**	**1,902,580**	**2,793,307**	**1,677,056**
Total Resources	**1,814,772**	**1,970,377**	**2,115,624**	**3,786,480**	**2,987,902**
Operating Expenditures					
Physical Environment	733,035	678,264	789,833	821,534	851,713
Total Operating Expenditures	**733,035**	**678,264**	**789,833**	**821,534**	**851,713**
Net Operating Income (Expenses)	**911,187**	**1,103,686**	**1,112,747**	**1,971,773**	**825,344**
Non-Operating Revenues					
Debt Proceeds	-	-	-	-	1,390,970
Other Financing Sources	-	-	-	-	3,292
Transfers-In	-	-	-	-	33,403
Non-Revenues	-	-	2,864	44,972	-
Total Non-Operating Revenues	**-**	**-**	**2,864**	**44,972**	**1,427,665**
Non Operating Expenditures					
Debt Service	153,474	149,079	141,821	54,546	351,680
Capital Expenditures	44,438	134,099	86,048	130,779	660,695
Other Financing Uses	413,918	510,542	410,364	1,178,304	1,116
Transfers-Out	-	-	-	-	33,403
Non-Expenditures	281,480	285,349	275,022	335,443	-
Total Non-Operating Expenditures	**893,310**	**1,079,069**	**913,255**	**1,699,072**	**1,046,895**
Increase (Decrease) in Cash and Investments	**17,877**	**24,617**	**202,356**	**317,673**	**1,206,114**
Ending Cash and Investments	**$188,427**	**$213,044**	**$415,400**	**$1,310,846**	**$2,516,960**
Reserved	79,750	81,329	83,435	683,485	1,030,176
Unreserved	108,677	131,715	331,965	627,361	1,486,783

Note: Different fund detail was available for different years; the total for all funds is shown here for all years.

FINDINGS AND TRENDS

- The District's water sales increased by 20.9 percent from 2009 to 2011, and another 12.5 percent from 2011 to 2013. The lower increases in later years were likely due to the depressed economy. Because total expenses have increased more slowly than revenue, net operating income increased each year through 2012. The decrease in net operating expenses in 2013 was primarily due to the zeroing out of other financing sources.

- The O&M Coverage Ratio (total operating revenue divided by total operating expenses) began 2009 at 224.3 percent, increased to 340.0 percent in 2012 and ended 2013 at 196.9 percent. A ratio of 100 percent or greater shows that revenue will successfully cover expenses and the District has remained well above this for the past 5 years.

- Net Operating Income as a percent of Operating Revenue in 2009 was 55.4 percent, increasing to a high of 70.6 percent in 2012, then lowering to 49.2 percent in 2013. Similar to the O&M Coverage Ratio, these trends help to show how successfully operating revenue actually covered operating expenses, with higher positive numbers being the best and negative numbers showing need for improvement.

- The Debt Service Coverage Ratio is required by bond covenants to remain above 1.25 during the life of the loans. This ratio is calculated by dividing cash operating income (revenue less expenses before depreciation) by annual revenue bond expenses. This ratio remains well above the target, beginning 2009 at 5.94, increasing to a high of 36.15 in 2012 due in large part to other financing sources not requiring coverage and lowering again to 2.35 in 2013 when other financing sources zero out.

CURRENT FINANCIAL STRUCTURE

This section summarizes the current financial structure used as the baseline for the capital financing strategy and financial forecast developed for this WSP.

FINANCIAL PLAN

The District is responsible for funding all of its costs. The primary source of funding is derived from ongoing monthly charges for service, with additional revenue coming from the Surfside Management contract, delinquent lock-off fees, customer service charges, new customer fees, and other miscellaneous revenue. The District controls the level of user charges and, subject to the Board of Commissioners approval, can adjust user charges as needed to meet financial objectives.

The financial plan can only provide a qualified assurance of financial feasibility if it considers the total system costs of providing water services, both operating and capital. To meet these objectives, the following elements have been completed:

1. **Capital Funding Plan**. Identifies the total capital improvement plan (CIP) obligations of the planning period. The plan defines a strategy for funding the CIP including an analysis of available resources from rate revenues, existing reserves, connection charges, debt financing, and any special resources that may be readily available (e.g., grants, developer contributions, etc.). The capital funding plan impacts the financial plan through the use of debt financing (resulting in annual debt service) and the assumed rate revenue available for capital funding.

2. **Financial Forecast**. Identifies future annual non-capital costs associated with the operating, maintenance and administration of the water system. Included in the financial plan is a reserve analysis that forecasts cash flow and fund balance activity along with testing for satisfaction of actual or recommended minimum fund balance policies. The financial plan ultimately evaluates the sufficiency of utility revenues in meeting all obligations, including cash uses such as operating expenses, debt service, capital outlays, and reserve contributions, as well as any coverage requirements associated with long-term debt. The plan also identifies the future adjustments required to fully fund all utility obligations in the projection period.

CAPITAL FUNDING PLAN

The CIP developed for this WSP identifies $4.37 million in project costs over the 6-year planning horizon and $8.23 million in the 20-year period. This CIP consists of 17 projects, including South Wellfield and North Wellfield wells, AMR meter replacements, and various water mains. Costs are stated in 2014 dollars and are escalated by 3.62 percent annually to the year of planned spending for financing projections.

A summary of the 20-year CIP is shown in Table 9-2. As shown, each year has varied capital cost obligations depending on construction schedules and infrastructure planning needs. Approximately 53.10 percent (2014 dollars) of the capital costs are included in the 6-year planning period. The South Wellfield and North Wellfield wells account for 45.77 percent of the 6-year CIP. Table 9-3 provides more detail for the 6-year CIP.

TABLE 9-2

6- and 20-Year CIP

Year	2014$	Inflated
2015	$2,025,000	$2,174,212
2016	$713,000	$793,241
2017	$424,000	$488,787
2018	$570,000	$680,875
2019	$319,000	$394,840
2020	$319,000	$409,129
6-Year Total	**$4,370,000**	**$4,941,083**
2021 2034	$3,860,000	$6,040,831
20-Year Total	**$8,230,000**	**$10,981,914**

TABLE 9-3

6-Year CIP Detail (2014$)

Project	2015	2016	2017	2018	2019	2020
M-01 AMR Meter Replacements	525,000					
S-01 SWF and NWF Wells	1,500,000	500,000				
D-02 Install Fire Hydrant at SR 103 and 179th		12,000				
D-03 Relocate Service for "Free by the Sea"		30,000				
D-04 Add Four Distribution System Sample Stations		9,000	9,000	9,000	9,000	9,000
E-01 Construction Equipment		162,000				
P-01 New Booster Pumping System at Birch Place and 227th			250,000			
D-13 Water Main on 253rd Place			165,000			
D-05 Water Main on Ash Place and Birch Place				338,000		
D-01 Water Main on 245th Lane				223,000		
D-12 Water Main on U Street					310,000	310,000
Total	**$2,025,000**	**$713,000**	**$424,000**	**$570,000**	**$319,000**	**$319,000**

CAPITAL FINANCING STRATEGY

An ideal capital financing strategy would include the use of grants and low-cost loans when debt issuance is required. However, these resources are very limited and competitive in nature and do not provide a reliable source of funding for planning purposes. It is recommended that the District pursue these funding avenues but assume bond financing to meet needs for which the District's available cash resources are insufficient. The capital financing strategy developed to fund the CIP identified in this WSP assumes the following funding resources:

- Accumulated cash reserves
- Transfers of excess cash (over minimum balance targets) from the Operating Fund
- Annual cash from rates earmarked for routine capital funding
- Interest earned on Capital Fund balances and other miscellaneous capital resources

Based on information provided by the District, the water utility began 2014 with $450,000 in the Revenue Fund and $2.79 million in the Capital Fund, due in large part to Drinking Water State Revolving Fund (DWSRF) loans available for scheduled projects. Additional funds beyond the Operation Fund target of $500,000 are transferred to the Capital Fund, and average about $36,000 per year in 2015 to 2034. Rate funded system reinvestment is funded at $316,000 in 2015, increasing an average of $45,000 per year through 2034.

The cash resources described above are forecasted to fund 100 percent of the 20-year CIP. Table 9-4 presents the corresponding 20-year capital financing strategy.

TABLE 9-4

20-Year Capital Funding Strategy

Year	Capital Expenditures 2014$	Capital Expenditures Escalated	Debt Financing	Cash Funding	Total Financial Resources
2015	$2,025,000	**$2,174,212**	-	$2,174,212	**$2,174,212**
2016	$713,000	**$793,241**	-	$793,241	**$793,241**
2017	$424,000	**$488,787**	-	$488,787	**$488,787**
2018	$570,000	**$680,875**	-	$680,875	**$680,875**
2019	$319,000	**$394,840**	-	$394,840	**$394,840**
2020	$319,000	**$409,129**	-	$409,129	**$409,129**
Subtotal	**$4,370,000**	**$4,941,083**	**-**	**$4,941,083**	**$4,941,083**
2021 – 2034	$3,860,000	**$6,040,831**	-	$6,040,831	**$6,040,831**
Total	**$8,230,000**	**$10,981,914**	**-**	**$10,981,914**	**$10,981,914**

The 20-year capital funding plan identifies 100 percent cash funding for capital projects. This type of planning looks at average growth over the 20-year period and does not take into consideration the current economic conditions, which can have a negative impact on annual growth. It is assumed that if growth is not occurring at the planned rate, the timing of capital projects would be adjusted accordingly.

AVAILABLE FUNDING ASSISTANCE AND FINANCING RESOURCES

Feasible long-term capital funding strategies must be defined to ensure that adequate resources are available to fund the CIP identified in this WSP. In addition to the District's resources such as accumulated cash reserves, capital revenues, and rate revenues designated for capital purposes, capital needs can be met from outside sources such as grants, low-interest loans, and bond financing. The following is a summary of the District's internal and external resources.

DISTRICT RESOURCES

Resources appropriate for funding capital needs include accumulated cash in the capital fund, rate revenues designated for capital spending purposes, and capital-related charges such as the General Facilities Charge (GFC). The first two resources will be discussed in the Fiscal Policies section of the Financial Forecast. Capital-related charges are discussed below.

Capital Connection Charges

A connection charge such as the GFC refers to a one-time charge imposed on new customers as a condition of connecting to the water system. The purpose of the connection charge is two-fold: to promote equity between new and existing customers and to provide a source of revenue to fund capital projects. Revenue can only be used to fund utility capital projects or to pay debt service incurred to finance those projects. The District currently charges all new customers a GFC based on the size of meter, with the charge currently set at $1,243 for a 3/4-inch meter.

Local Facilities Charges

While a connection charge is the manner in which new customers pay their share of general facilities costs, local facilities funding is used to pay the costs of local facilities that connect each property to the system's infrastructure. Local facilities funding is often overlooked in rate forecasting because it is funded up-front by either connecting customers, developers, or through an assessment to properties, but never from rates.

A number of mechanisms can be considered toward funding local facilities. One of the following scenarios typically occurs: (a) the utility charges a connection fee based on the cost of the local facilities (under the same authority as the GFC); (b) a developer funds extension of the system to its development and turns those facilities over to the utility (contributed capital); or (c) a local assessment is set up called a Utility Local Improvement District (ULID/LID) or a Local Utility District (LUD) which collects tax revenue from benefited properties.

A local facilities charge (LFC) is a variation of the connection charge. It is a District-imposed charge to recover the cost related to service extension to local properties. Often called a front-footage charge and imposed on the basis of footage of the main "fronting" a particular property, it is usually implemented as a reimbursement mechanism to a District for the cost of a local facility that directly serves a property. It is a form of connection charge and thus can accumulate up to 10 years of interest. It typically applies in instances when no developer-installed facilities are needed through developer extension due to the prior existence of available mains already serving the developing property.

The developer extension is a requirement that a developer install onsite and sometimes offsite improvements as a condition of extending service. These are in addition to the connection charge required and must be built to District standards. Part of the agreement between the District and the developer planning to extend service might include a latecomer agreement, resulting in a latecomer charge to new connections to the developer extension.

Latecomer charges are a variation of developer extensions whereby new customers connecting to a developer-installed improvement make a payment to the District based on

their share of the developer's cost. The District passes this charge on to the developer who installed the facilities. As part of the developer extension process, this defines the allocation of costs and records latecomer obligations on the title of affected properties. No interest is allowed, and the reimbursement agreement cannot exceed 20 years in duration.

LID/ULID is another mechanism for funding infrastructure that assesses benefited properties based on the special benefit received by the construction of specific facilities. Most often used for local facilities, some ULIDs also recover related general facilities costs. Substantial legal and procedural requirements can make this a relatively expensive process, and there are mechanisms by which a ULID can be rejected.

OUTSIDE RESOURCES

This section outlines various grant, loan and bond opportunities available to the District through federal and state agencies to fund the CIP identified in the WSP.

Grants and Low Cost Loans

Historically, federal and state grant programs were available to local utilities for capital funding assistance. However, these assistance programs have been mostly eliminated, substantially reduced in scope and amount, or replaced by loan programs. Remaining miscellaneous grant programs are generally lightly funded and heavily subscribed. Nonetheless, even the benefit of low-interest loans makes the effort of applying worthwhile. Grants and low-cost loans for Washington State utilities are available from the Department of Commerce including two assistance programs that the District may be eligible for.

Public Works Trust Fund (PWTF) – Cities, counties, special purpose districts, public utility districts, and quasi-municipal governments are eligible to receive loans from the PWTF. Eligible projects include repair, replacement, and construction of infrastructure for domestic water, sanitary sewer, stormwater, solid waste, road, and bridge projects that improve public health and safety, respond to environmental issues, promote economic development, or upgrade system performance. Due to current funding restrictions and funding allocations, the Public Works Board has suspended the non-Construction Programs. As the economy builds, the Board will attempt to re-institute these programs.

PWTF loans are available at interest rates ranging from 1.28 percent to 2.55 percent depending on the repayment term, with reduced interest rates available for all projects located in communities that have been declared a natural disaster. The standard loan offer is 2.55 percent interest repaid over a 5- to 20-year term. All loan terms are subject to negotiation and Board approval. Currently no local match is required and the maximum loan amount is $7 million per jurisdiction per biennium.

Due to legislative budget changes made on June 30, 2013, the 2014 Construction Loan cycle did not receive funding. The Legislature also passed a statute with the intent of redirecting tax revenue from the Public Works Assistance Account for six years to the state General Fund. Loan repayment revenues will continue to be available in future biennia. The effect of this diversion resulted in a decrease in funding available to local governments for high priority infrastructure projects from the Public Works Trust Fund. For drinking water and sanitary sewer projects not on the 2014 unfunded PWTF list, applicants must first apply to the Departments of Health or Ecology during their normal funding cycle. Only projects that were not selected for funding and/or were partially funded by these agencies are eligible for the 2016 Construction Loan program.

Information regarding the application process as well as rates and terms are posted on the PWTF website in early spring.

Further detail is available at http://www.pwb.wa.gov.

Drinking Water State Revolving Fund (DWSRF) Loan Program – DWSRF funding historically targets protection of public health, compliance with drinking water regulations and assistance for small and disadvantaged communities. Terms are up to 20 years to pay back, and in some cases, provide partial loan forgiveness. Interest rates are 1.0 to 1.5 percent and no local match is required.

Applicants need an approved water system plan, or plan amendment, containing the DWSRF project prior to submitting an application. All public water systems that receive a DWSRF loan must undergo an environmental review, a cultural review, and an Investment Grade Efficiency Audit (IGEA). The IGEA is an effort to apply energy efficiency to water systems and may be financed as part of the DWSRF loan.

Two loan cycles were offered in the spring and fall of 2013. The DWSRF Loan Program has shifted their application cycle to the fall and now plans to accept applications annually in September.

Further detail is available at http://www.doh.wa.gov.

Bond Financing

General Obligation Bonds – General Obligation (G.O.) bonds are bonds secured by the full faith and credit of the issuing agency, committing all available tax and revenue resources to debt repayment. With this high level of commitment, G.O. bonds have relatively low interest rates and few financial restrictions. However, the authority to issue G.O. bonds is restricted in terms of the amount and use of the funds, as defined by Washington constitution and statute. Specifically, the amount of debt that can be issued is linked to assessed valuation.

RCW 57.20.110 states:

> *"A district is authorized and empowered by and through its board of commissioners to contract indebtedness for its purposes, and maintenance thereof not exceeding one-half of one percent of the value of the taxable property in the district…"*

And RCW 57.20.120 states:

> *"A district may contract indebtedness in excess of the amount named in RCW 57.20.110, but not exceeding in amount, together with existing indebtedness, two and one-half percent of the value of the taxable property in that district […], and impose excess property tax levies to retire the indebtedness whenever a ballot proposition authorizing the indebtedness and excess levies is approved…"*

While bonding capacity can limit availability of G.O. bonds for utility purposes, these can sometimes play a valuable role in project financing. A rate savings may be realized through two avenues: the lower interest rate and related bond costs; and the extension of repayment obligation to all tax-paying properties (not just developed properties) through the authorization of an ad valorem property tax levy.

Revenue Bonds – Revenue bonds are commonly used to fund utility capital improvements. The debt is secured by the revenues of the issuing utility. With this limited commitment, revenue bonds typically bear higher interest rates than G.O. bonds and also require security conditions related to the maintenance of dedicated reserves (a bond reserve) and financial performance (added bond debt service coverage). The District agrees to satisfy these requirements by resolution as a condition of bond sale.

Revenue bonds can be issued in Washington without a public vote. There is no bonding limit, except perhaps the practical limit of the utility's ability to generate sufficient revenue to repay the debt and provide coverage. In some cases, poor credit might make issuing bonds problematic.

FINANCIAL FORECAST

The financial forecast, or revenue requirement analysis, forecasts the amount of annual revenue that needs to be generated by user rates. The analysis incorporates operating revenues, O&M expenses, debt service payments, rate-funded capital needs, and any other identified revenues or expenses related to operations. The objective of the financial forecast is to evaluate the sufficiency of the current level of rates. In addition to annual operating costs, the revenue needs also include debt covenant requirements and specific fiscal policies and financial goals of the District.

The analysis determines the amount of revenue needed in a given year to meet that year's expected financial obligations. For this analysis, two revenue sufficiency tests have been

developed to reflect the financial goals and constraints of the District: cash needs must be met, and debt coverage requirements must be realized. In order to operate successfully with respect to these goals, both tests of revenue sufficiency must be met.

Cash Test – The cash flow test identifies all known cash requirements for the District in each year of the planning period. Typically these include O&M expenses, debt service payments, depreciation funding or directly funded capital outlays, and any additions to specified reserve balances. The total annual cash needs of the District are then compared to projected cash revenues using the current rate structure. Any projected revenue shortfalls are identified and the rate increases necessary to make up the shortfalls are established.

Coverage Test – The coverage test is based on a commitment made by the District when issuing revenue bonds and some other forms of long-term debt. For purposes of this analysis, revenue bond debt is assumed for any needed debt issuance. As a security condition of issuance, the District would be required per covenant to agree that the revenue bond debt would have a higher priority for payment (a senior lien) compared to most other expenditures; the only outlays with a higher lien are O&M expenses. Debt service coverage is expressed as a multiplier of the annual revenue bond debt service payment. For example, a 1.00 coverage factor would imply that no additional cushion is required. A 1.25 coverage factor means revenue must be sufficient to pay O&M expenses, annual revenue bond debt service payments, plus an additional 25 percent of annual revenue bond debt service payments. The excess cash flow derived from the added coverage, if any, can be used for any purpose, including funding capital projects. Targeting a higher coverage factor can help the District achieve a better credit rating and provide lower interest rates for future debt issues.

In determining the annual revenue requirement, both the cash and coverage sufficiency test must be met and the test with the greatest deficiency drives the level of needed rate increase in any given year.

CURRENT FINANCIAL STRUCTURE

The District maintains a fund structure and implements financial policies that target management of a financially viable and fiscally responsible water system.

FISCAL POLICIES

A brief summary of the key financial policies employed by the District, as well as those recommended and incorporated in the financial program are discussed below.

Operating Fund – Operating reserves are designed to provide a liquidity cushion to ensure that adequate cash working capital will be maintained to deal with significant cash balance fluctuations such as seasonal fluctuations in billings and receipts, unanticipated cash expenses, or lower than expected revenue collections. The District's current policy

is to maintain a minimum balance in the Operation Fund equal to $450,000. This target is reasonable for a water system, given the variability in revenue collections due to changing weather patterns that can significantly affect revenue collections during the summer season.

Capital Fund – A capital contingency reserve is an amount of cash set aside in case of an emergency should a piece of equipment or a portion of the utility's infrastructure fail unexpectedly. The reserve could also be used for other unanticipated capital needs including capital project cost overruns. Industry practices range from maintaining a balance equal to 1 to 2 percent of fixed assets, an amount equal to a 5-year rolling average of CIP costs, or an amount determined sufficient to fund equipment failure (other than catastrophic failure). The final target level should balance industry standards with the risk level of the District. The District does not currently have a policy to maintain a minimum balance in the Capital Fund, but the higher than average operating fund minimum balance makes this reasonable.

System Reinvestment – The purpose of system reinvestment funding is to provide for the replacement of aging system facilities to ensure sustainability of the system for ongoing operation. Each year, the District's assets lose value, and as they lose value they are moving toward eventual replacement. That accumulating loss in value and future liability is measured for reporting purposes through the annual depreciation expense, which is based on the original cost of the asset. While this reported expense reflects the consumption of the existing asset and its original investment, the replacement of that asset will likely cost much more, factoring in inflation and construction conditions. Therefore, the added annual replacement liability is even greater than the annual depreciation expenses.

The District has historically funded system reinvestment at varying levels. In this analysis, the routine capital expense for system reinvestment starts at $316,000 per year and increases by an average of $45,000 annually. These monies are put directly into the Capital Fund and are made available for capital project costs.

Debt Management – It is prudent to consider policies related to debt management as part of the broader utility financial policy structure. Debt management policies should be evaluated and formalized including the level of acceptable outstanding debt, debt repayment, bond coverage and total debt coverage targets. The District's existing bond covenants require a 1.25 debt coverage test, which is met throughout the forecast.

Financial Forecast

The financial forecast is developed from 2015 budget documents along with other key factors and assumptions to develop a complete portrayal of the District's annual financial obligations. The following is a list of the key revenue and expense factors and assumptions used to develop the financial forecast:

- **Revenue** – The District has two general revenue sources: revenue from charges for service (rate revenue) and miscellaneous (non-rate) revenue. In the event of a forecasted annual shortfall, rate revenue can be increased to meet the annual revenue requirement. All revenue is forecast to increase with customer growth.

- **General Facility Charge Revenue** – The current GFC is expected to remain at $1,243 throughout the forecast and to generate about $10,000 per year collected from about 8 new connections per year. This money is used to fund growth related capital projects.

- **Growth** – Rate revenue from the base rate is escalated based on the growth rate of 0.26 percent provided in Chapter 2 of this WSP.

- **Demand** – Metered water sales is based on usage, which is forecast to decrease at a rate of -0.50 percent per Equivalent Residential Unit (ERU) per year; offset by the average annual growth rate of 0.26 percent, the resulting demand growth of -0.24 percent per year is used to forecast metered water sales revenue.

- **Expenses** – O&M expense projections are based on the 2015 budget and are forecasted to increase with general cost inflation of 2.39 percent, construction cost inflation of 3.62 percent, labor cost inflation of 2.86 percent, and benefit cost inflation of 10.00 percent. Taxes are calculated based on forecasted revenues and prevailing tax rates. Rent and electricity costs are zeroed out in 2016 due to new building completion, and additional non-capital improvement costs identified in chapter 8 are added in 2015 through 2020.

- **Existing Debt** – The District currently has a total of six outstanding debt issues, including one revenue bond, two PWTF loans, two DWSRF loans, and one Bias Software loan. Revenue bond annual payments range from $271,000 to $276,000 and expire in 2032. PWTF annual payments range from $106,000 to $111,000 and expire in 2025. DWSRF annual payments range from $58,000 to $157,000 and expire in 2034 and 2035. The Bias Software loan is $4,000 per year through 2017.

- **Future Debt** – The capital financial strategy developed for this WSP indicates no new debt issuance is required.

- **Reserves** – Any Operation Fund balance above the maximum requirement is assumed to be available to fund capital projects and is projected to be transferred to the Capital Fund each year. The 2015 Operation Fund balance is expected to end the year at $500,000, which

is above the target for that year. The Capital Fund balance is expected to end the year at approximately $1.08 million, including loan amounts. The Rate Stabilization Reserve is expected to remain at $1.00 million throughout the forecast.

Although the financial plan is completed for the 20-year time horizon of this WSP, the rate strategy focuses on the shorter term planning period 2015 through 2020. It is imperative that the District revisit the proposed rates every 2 to 3 years to ensure that the rate projections developed remain adequate. Any significant changes should be incorporated into the financial plan and future rates should be adjusted as needed.

Table 9-5 summarizes the annual revenue requirements based on the forecast of revenues, expenditures, fund balances and fiscal policies.

TABLE 9-5

6-Year Financial Forecast

Revenue Requirement	2015	2016	2017	2018	2019	2020
Revenues						
Rate Revenue Under Existing Rates	$1,579,301	$1,582,203	$1,585,115	$1,588,037	$1,590,970	$1,593,913
Non-Rate Revenues	127,500	127,285	127,609	127,935	128,261	128,588
Total Revenues	**$1,706,801**	**$1,709,487**	**$1,712,724**	**$1,715,972**	**$1,719,231**	**$1,722,501**
Expenses						
Cash Operating Expenses	$922,400	$888,206	$910,309	$932,523	$955,335	$1,058,764
Existing Debt Service	448,564	545,918	542,073	533,530	533,860	532,641
New Debt Service	-	-	-	-	-	-
Rate Funded System Reinvestment	316,000	316,000	344,000	372,000	395,000	420,000
Total Expenses	**$1,686,964**	**$1,750,124**	**$1,796,382**	**$1,838,053**	**$1,884,196**	**$2,011,404**
Net Surplus (Deficiency)	**$19,838**	**($40,636)**	**($83,658)**	**($122,081)**	**($164,965)**	**($288,903)**
Additions to Meet Coverage	-	-	-	-	-	-
Total Surplus (Deficiency)	**$19,838**	**($40,636)**	**($83,658)**	**($122,081)**	**($164,965)**	**($288,903)**
% of Rate Revenue	**0.00%**	**2.57%**	**5.28%**	**7.69%**	**10.37%**	**18.13%**
Annual Rate Adjustment	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**
Cumulative Annual Rate Adjustment	**2.50%**	**5.06%**	**7.69%**	**10.38%**	**13.14%**	**15.97%**
Rate Revenues After Rate Increase	$1,618,784	$1,662,302	$1,706,995	$1,752,896	$1,800,036	$1,848,451
Additional Taxes From Rate Increase	$1,986	$4,028	$6,129	$8,291	$10,514	$12,801
Net Cash Flow After Rate Increase	**$57,335**	**$35,435**	**$32,093**	**$34,487**	**$33,588**	**($47,166)**
Coverage After Rate Increase	**3.07**	**3.32**	**3.41**	**3.51**	**3.56**	**3.34**

The financial forecast indicates the need for rate increases of 2.50 percent per year in 2015 through 2020. The rate increases are needed to cover the existing level of O&M expenses, increase the level of capital funding, and maintain adequate ending fund balance targets.

DISTRICT FUNDS AND RESERVES

Table 9-6 shows a summary of the projected Operation Fund and Capital Fund ending balances through 2020 based on the rate forecasts presented above. The combined minimum target balance is based on the minimum target for the Operation Fund and the funds remain well above that throughout the forecast.

TABLE 9-6

Ending Cash Balance Summary

Ending Fund Balances	2015	2016	2017	2018	2019	2020
Operation Fund	$500,000	$500,000	$500,000	$500,000	$500,000	$452,834
Capital Fund	$1,084,768	$655,707	$554,552	$291,439	$335,731	$357,299
Total	**$1,584,768**	**$1,155,707**	**$1,054,552**	**$791,439**	**$835,731**	**$810,133**
Combined Minimum Target Balance	$450,000	$450,000	$450,000	$450,000	$450,000	$450,000

CURRENT AND PROJECTED RATES

CURRENT RATES

The District's current rate structure consists of two rate components – a monthly base rate based on meter size and a consumption charge per 100 cubic feet (ccf) of water usage. Table 9-7 shows the existing rate structure.

TABLE 9-7

2014 Existing Rate Structure

Monthly Base Rate	Current
Residential	
3/4 Inch	$39.73
1 Inch	$66.33
Commercial	
3/4 Inch	$39.73
1 Inch	$66.33
1 1/2 Inch	$132.34
2 Inch	$202.56
3 Inch	$230.78
4 Inch	$348.69
6 Inch	$677.23
Fire Flow	
6 Inch	$77.56
8 Inch	$101.57
Metered Water Rate (per ccf)	**$2.19**

PROJECTED RATES

The analysis for this WSP shows a need for increases of 2.50 percent per year in 2015 through 2020. The rate changes are made for a number of reasons and are phased in over a 6-year period. The changes are based on the following: (1) Fire rates are increased to cover the general cost of fire; (2) usage rate is increased more in the initial years to reach the goal of 20.00 percent of revenue collection based on usage; and (3) Residential and Commercial base rates are held constant until the 20.00 percent of revenue from usage goal is reached, and are then increased across the board beginning in 2017. Table 9-8 shows the proposed rates for the 6-year planning period based on these changes. Table 9-9 shows Residential monthly bill comparisons for the proposed annual increases.

TABLE 9-8

6-Year Proposed Rates

Monthly Base Rate	Current	2015	2016	2017	2018	2019	2020
Residential							
3/4 Inch	$39.73	$39.73	$39.73	$40.16	$41.09	$42.04	$43.02
1 Inch	$66.33	$66.33	$66.33	$67.06	$68.62	$70.21	$71.85
Commercial							
3/4 Inch	$39.73	$39.73	$39.73	$40.16	$41.09	$42.04	$43.02
1 Inch	$66.33	$66.33	$66.33	$67.06	$68.62	$70.21	$71.85
1 1/2 Inch	$132.34	$132.34	$132.34	$133.72	$136.82	$140.00	$143.26
2 Inch	$202.56	$202.56	$202.56	$204.80	$209.54	$214.41	$219.41
3 Inch	$230.78	$230.78	$230.78	$233.31	$238.71	$244.26	$249.95
4 Inch	$348.69	$348.69	$348.69	$352.58	$360.74	$369.12	$377.73
6 Inch	$677.23	$677.23	$677.23	$684.68	$700.53	$716.81	$733.51
Fire Flow							
6 Inch	$77.56	$107.90	$138.25	$168.59	$198.93	$229.28	$259.62
8 Inch	$101.57	$153.88	$206.18	$258.49	$310.80	$363.10	$415.41
Metered Water Rate (per ccf)	**$2.19**	**$2.53**	**$2.89**	**$3.13**	**$3.22**	**$3.31**	**$3.41**

TABLE 9-9

Monthly Bill Comparisons

Residential	Current	2015	2016	2017	2018	2019	2020
Monthly Bill	$47.61	$48.85	$50.13	$51.41	$52.67	$53.97	$55.30
$ Difference		$1.24	$1.28	$1.28	$1.26	$1.30	$1.33

Note: Assumes 3/4-inch meter and 3.6 ccf monthly usage.

AFFORDABILITY

The Department of Health and the Department of Commerce Public Works Board use an affordability index to prioritize low-cost loan awards depending on whether rates exceed 2.0 percent of the median household income for the service area. The District currently serves customers in Ocean Park on the Long Beach Peninsula. Since there is no census

data available for this specific area, average data for the County has been used. The median household income for Pacific County was $40,873 in 2008 – 2012 according to the U.S. Census Bureau. The 2012 figures are escalated based on the assumed 2.39 percent general cost inflation to show the median household income in future years. Table 9-10 presents the District's rates with the projected rate increases for the forecast period, tested against the 2.0 percent monthly affordability threshold.

TABLE 9-10

Affordability Test

Year	Inflation	Median HH Income	2% Monthly Threshold	Projected Monthly Bill	% of Median HH Income
2012		$40,873	$68.12		
2013	2.39%	$41,851	$69.75		
2014	2.39%	$42,852	$71.42	$47.61	1.33%
2015	2.39%	$43,878	$73.13	$48.85	1.34%
2016	2.39%	$44,928	$74.88	$50.13	1.34%
2017	2.39%	$46,002	$76.67	$51.41	1.34%
2018	2.39%	$47,103	$78.51	$52.67	1.34%
2019	2.39%	$48,230	$80.38	$53.97	1.34%
2020	2.39%	$49,384	$82.31	$55.30	1.34%

Applying the 2.0 percent test, the District's rates are forecasted to remain within the indicated affordability range through 2020.

CONCLUSION

The results of this analysis indicate that rate increases are necessary to fund ongoing operating needs and CIP. Implementation of the proposed rate increases should provide for continued financial viability while maintaining generally affordable rates.

It is important to remember that the analysis performed in this chapter assumes growth rates from Chapter 2 of this WSP. If the future growth rates change, the proposed annual rate increases may need to be updated and revised.

It is recommended that the District regularly review and update the key underlying assumptions that compose the multi-year financial plan to ensure that adequate revenues are collected to meet the District's total financial obligations.

APPENDIX A

WATER FACILITIES INVENTORY FORMS

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 08/20/2014
Printed: 10/23/2014
WFI Printed For: On-Demand
Submission Reason: Source Update

RETURN TO: Southwest Regional Office, PO Box 47823, Olympia, WA, 98504

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
63000 C	NORTH BEACH WATER	PACIFIC	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS	7. OWNER NAME & MAILING ADDRESS	8. Owner Number 032670
WILLIAM (BILL) M. NEAL III [MANAGER] PO BOX 618 OCEAN PARK, WA 98640	NORTH BEACH WATER DISTRICT WILLIAM (BILL) M. NEAL III P.O. BOX 618 OCEAN PARK, WA 98640	TITLE: MANAGER
STREET ADDRESS IF DIFFERENT FROM ABOVE	**STREET ADDRESS IF DIFFERENT FROM**	
ATTN ADDRESS CITY STATE ZIP	ATTN ADDRESS 25902 VERNON AVE STE C CITY OCEAN PARK STATE WA ZIP 98640	

9. 24 HOUR PRIMARY CONTACT INFORMATION	10. OWNER CONTACT INFORMATION
Primary Contact Daytime Phone: (360) 665-4144	Owner Daytime Phone: (360) 665-4144
Primary Contact Mobile/Cell Phone: (360) 244-0068	Owner Mobile/Cell Phone: (360) 244-0068
Primary Contact Evening Phone: (xxx) xxx-xxxx	Owner Evening Phone: (xxx) xxx-xxxx
Fax:(360) 665-4641 | E-mail: XXXXXX	Owner Fax Phone: | E-mail: XXXXXX

WAC 246-290-420(9) requires that water systems provide 24-hour contact information for emergencies.

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- [x] Not applicable (Skip to #12)
- [ ] Owned and Managed — SMA NAME: _____ SMA Number:
- [ ] Managed Only
- [ ] Owned Only

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

[ ] Agricultural	[x] Hospital/Clinic	[x] Residential
[x] Commercial / Business	[x] Industrial	[x] School
[x] Day Care	[ ] Licensed Residential Facility	[ ] Temporary Farm Worker
[x] Food Service/Food Permit	[x] Lodging	[x] Other (church, fire station, etc.):
[x] 1,000 or more person event for 2 or more days per year	[x] Recreational / RV Park	

13. WATER SYSTEM OWNERSHIP (mark only one)				14. STORAGE CAPACITY (gallons)
[ ] Association	[ ] County	[ ] Investor	[x] Special District	
[ ] City / Town	[ ] Federal	[ ] Private	[ ] State	748,000

- SEE NEXT PAGE FOR A COMPLETE LIST OF SOURCES -

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
63000 C	NORTH BEACH WATER	PACIFIC	A	Comm

15	16	17	18									19			20	21						22	23	24			
	SOURCE NAME	INTERTIE	SOURCE CATEGORY									USE				TREATMENT						DEPTH		SOURCE LOCATION			
Source Number	LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL	SPRING	SPRING IN SPRING FIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANEANT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	NORTH WELL #1 AGP146		X											X	Y	X						82	100	SW NE	28	12N	11W
S02	NORTH WELL #2 AGP145		X											X	Y	X						122	100	SW NE	28	12N	11W
S03	NORTH WELL #3 AGP147		X											X	Y	X						114	100	SW NE	28	12N	11W
S04	NORTH WELL #4 WW AGP149				X							X			Y	X						100	100	SW NE	28	12N	11W
S05	NORTH WELL #5 WW NO TAG				X							X			Y	X						104	100	SW NE	28	12N	11W
S06	NORTH WF (S04,5,7,8 & 9)			X								X						X			X	82	835	SW NE	28	12N	11W
S07	NORTH WELL #6 WW AGP152				X							X			Y	X						127	112	SW NE	28	12N	11W
S08	NORTH WELL #7 WW AGP148				X							X			Y	X						120	100	SW NE	28	12N	11W
S09	NORTH WELL #8 WW AGP151				X							X			Y	X						126	123	SW NE	28	12N	11W
S10	SOUTH WELL #1 20051/PWC S01 AGP154		X											X	Y			X			X	41	30	SE NE	33	12N	11W
S11	SOUTH WELL #2 20051/PWC S02 AGP155		X											X	Y			X			X	85	60	NW NE	33	12N	11W
S12	InAct 11/04/2008 SOUTH WELL #4 20051/PWC S04 AGP156		X											X	Y			X			X	101	80	SE NE	33	12N	11W

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
63000 C	NORTH BEACH WATER	PACIFIC	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED CONNECTIONS
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)	0	3119	Unspecified
A. Full Time Single Family Residences (Occupied 180 days or more per year)	1510		
B. Part Time Single Family Residences (Occupied less than 180 days per year)	1090		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	14		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year	94		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied less than 180 days/year	425		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	75	75	
28. TOTAL SERVICE CONNECTIONS		3194	

29. FULL-TIME RESIDENTIAL POPULATION	
A. How many residents are served by this system 180 or more days per	4010

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?	500	500	1000	2000	2500	3000	3000	3000	3000	2000	1000	1500
B. How many days per month are they present?	30	30	30	30	30	30	30	30	30	30	30	30
31. TEMPORARY & TRANSIENT USERS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?	2200	2200	2800	3000	3600	4400	7000	7000	10000	5000	4000	5000
B. How many days per month is water accessible to the public?	30	30	30	30	30	30	30	30	30	30	30	30
32. REGULAR NON-RESIDENTIAL USERS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?	665	665	670	680	680	690	490	500	750	680	680	690
B. How many days per month are they present?	30	30	30	30	30	30	30	30	30	30	30	30

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	6	6	6	8	8	9	9	9	9	8	7	7

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____
DATE: _____

PRINT NAME: _____
TITLE: _____

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 05/05/2014
Printed: 6/3/2014
WFI Printed For: On-Demand
Submission Reason: No Change

RETURN TO: Southwest Regional Office, PO Box 47823, Olympia, WA, 98504

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
63000 C	NORTH BEACH WATER	PACIFIC	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS	7. OWNER NAME & MAILING ADDRESS	8. Owner Number 032670
WILLIAM M. NEAL III [MANAGER] PO BOX 618 OCEAN PARK, WA 98640	NORTH BEACH WATER DISTRICT WILLIAM M. NEAL III P.O. BOX 618 OCEAN PARK, WA 98640	TITLE: MANAGER
STREET ADDRESS IF DIFFERENT FROM ABOVE	**STREET ADDRESS IF DIFFERENT FROM**	
ATTN ADDRESS CITY STATE ZIP	ATTN ADDRESS 25902 VERNON AVE STE C CITY OCEAN PARK STATE WA ZIP 98640	

9. 24 HOUR PRIMARY CONTACT INFORMATION	10. OWNER CONTACT INFORMATION
Primary Contact Daytime Phone: (360) 665-4144	Owner Daytime Phone: (360) 665-4144
Primary Contact Mobile/Cell Phone: (360) 244-0068	Owner Mobile/Cell Phone: (360) 244-0068
Primary Contact Evening Phone: (xxx) xxx-xxxx	Owner Evening Phone: (xxx) xxx-xxxx
Fax:(360) 665-4641 | E-mail: XXXXXX	Owner Fax Phone: | E-mail: XXXXXX

WAC 246-290-420(9) requires that water systems provide 24-hour contact information for emergencies.

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- [x] Not applicable (Skip to #12)
- [ ] Owned and Managed — SMA NAME: _____ SMA Number:
- [ ] Managed Only
- [ ] Owned Only

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

[ ] Agricultural	[x] Hospital/Clinic	[x] Residential
[x] Commercial / Business	[x] Industrial	[x] School
[x] Day Care	[ ] Licensed Residential Facility	[ ] Temporary Farm Worker
[x] Food Service/Food Permit	[x] Lodging	[x] Other (church, fire station, etc.):
[x] 1,000 or more person event for 2 or more days per year	[x] Recreational / RV Park	

13. WATER SYSTEM OWNERSHIP (mark only one)				14. STORAGE CAPACITY (gallons)
[ ] Association	[ ] County	[ ] Investor	[x] Special District	
[ ] City / Town	[ ] Federal	[ ] Private	[ ] State	748,000

- SEE NEXT PAGE FOR A COMPLETE LIST OF SOURCES -

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
63000 C	NORTH BEACH WATER	PACIFIC	A	Comm

15	16	17	18										19			20	21						22	23	24			
	SOURCE NAME	INTERTIE	SOURCE CATEGORY										USE				TREATMENT						DEPTH		SOURCE LOCATION			
Source Number	LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL	SPRING	SPRING IN SPRING FIELD	SPRING FIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANEANT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	NORTH WELL #1 WW AGP146				X								X			Y	X						82	100	SW NE	28	12N	11W
S02	NORTH WELL #2 WW AGP145				X								X			Y	X						122	100	SW NE	28	12N	11W
S03	NORTH WELL #3 WW AGP147				X								X			Y	X						114	100	SW NE	28	12N	11W
S04	NORTH WELL #4 WW AGP149				X								X			Y	X						100	100	SW NE	28	12N	11W
S05	NORTH WELL #5 WW NO TAG				X								X			Y	X						104	100	SW NE	28	12N	11W
S06	NORTH WF (SO1,2,3,4,5 & 7,8 & 9)			X									X						X			X	82	835	SW NE	28	12N	11W
S07	NORTH WELL #6 WW AGP152				X								X			Y	X						127	112	SW NE	28	12N	11W
S08	NORTH WELL #7 WW AGP148				X								X			Y	X						120	100	SW NE	28	12N	11W
S09	NORTH WELL #8 WW AGP151				X								X			Y	X						126	123	SW NE	28	12N	11W
S10	SOUTH WELL #1 20051/PWC S01 AGP154		X										X			Y			X			X	41	30	SE NE	33	12N	11W
S11	SOUTH WELL #2 20051/PWC S02 AGP155		X										X			Y			X			X	85	60	NW NE	33	12N	11W
S12	InAct 11/04/2008 SOUTH WELL #4 20051/PWC S04 AGP156		X												X	Y			X			X	101	80	SE NE	33	12N	11W

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
63000 C	NORTH BEACH WATER	PACIFIC	A	Comm

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B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year	94		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied less than 180 days/year	425		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	75	75	
28. TOTAL SERVICE CONNECTIONS		3194	

29. FULL-TIME RESIDENTIAL POPULATION	
A. How many residents are served by this system 180 or more days per	4010

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?	500	500	1000	2000	2500	3000	3000	3000	3000	2000	1000	1500
B. How many days per month are they present?	30	30	30	30	30	30	30	30	30	30	30	30
31. TEMPORARY & TRANSIENT USERS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?	2200	2200	2800	3000	3600	4400	7000	7000	10000	5000	4000	5000
B. How many days per month is water accessible to the public?	30	30	30	30	30	30	30	30	30	30	30	30
32. REGULAR NON-RESIDENTIAL USERS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?	665	665	670	680	680	690	490	500	750	680	680	690
B. How many days per month are they present?	30	30	30	30	30	30	30	30	30	30	30	30

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	6	6	6	8	8	9	9	9	9	8	7	7

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____
DATE: _____

PRINT NAME: _____
TITLE: _____

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 09/05/2013
Printed: 02/04/2014
WFI Printed For: On-demand
Submission Reason: Pop/Connect Update

RETURN TO: Southwest Regional Office, PO Box 47823, Olympia, WA, 98504

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
63000 C	NORTH BEACH WATER	PACIFIC	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS

WILLIAM M. NEAL III [MANAGER]
PO BOX 618.
OCEAN PARK, WA 98640

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS
CITY STATE ZIP

7. OWNER NAME & MAILING ADDRESS **8. Owner Number** 032670

NORTH BEACH WATER DISTRICT
WILLIAM M. NEAL III TITLE: MANAGER
P.O. BOX 618
OCEAN PARK, WA 98640

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS 25902 VERNON AVE STE C
CITY OCEAN PARK STATE WA ZIP 98640

9. 24 HOUR PRIMARY CONTACT INFORMATION		10. OWNER CONTACT INFORMATION	
Primary Contact Daytime Phone:	(360) 665-4144	Owner Daytime Phone:	(360) 665-4144
Primary Contact Mobile/Cell Phone:	(360) 244-0068	Owner Mobile/Cell Phone:	(360) 244-0068
Primary Contact Evening Phone:	(360) 665-3290	Owner Evening Phone:	(360) 665-3290
Fax: (360) 665-4641	E-mail: BNeal@NorthBeachWater.com	Fax: (360) 665-4641	E-mail: BNeal@NorthBeachWater.com

WAC 246-290-420(9) requires that water systems provide 24-hour contact information for emergencies.

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- [x] Not applicable (Skip to #12)
- [ ] Owned and Managed
- [ ] Managed Only
- [ ] Owned Only

SMA NAME: _____ SMA Number: _____

12. WATER SYSTEM CHARACTERISTICS (mark ALL that apply)

- [ ] Agricultural
- [x] Commercial / Business
- [x] Day Care
- [x] Food Service/Food Permit
- [x] 1,000 or more person event for 2 or more days per year
- [x] Hospital/Clinic
- [x] Industrial
- [ ] Licensed Residential Facility
- [x] Lodging
- [x] Recreational / RV Park
- [x] Residential
- [x] School
- [ ] Temporary Farm Worker
- [x] Other (church, fire station, etc.): _____

13. WATER SYSTEM OWNERSHIP (mark only one)

- [ ] Association
- [ ] City / Town
- [ ] County
- [ ] Federal
- [ ] Investor
- [ ] Private
- [x] Special District
- [ ] State

14. STORAGE CAPACITY (gallons)

748,000

--- SEE NEXT PAGE FOR A COMPLETE LIST OF SOURCES ---

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
63000 C	NORTH BEACH WATER	PACIFIC	A	Comm

15	16	17	18										19			20	21					22	23	24			
	SOURCE NAME	INTERTIE	SOURCE CATEGORY										USE				TREATMENT					DEPTH		SOURCE LOCATION			
Source Number	LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456. IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRINGFIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	NORTH WELL #1 WW AGP146				X								X			Y	X					82	100	SW NE	28	12N	11W
S02	NORTH WELL #2 WW AGP145				X								X			Y	X					122	100	SW NE	28	12N	11W
S03	NORTH WELL #3 WW AGP147				X								X			Y	X					114	100	SW NE	28	12N	11W
S04	NORTH WELL #4 WW AGP149				X								X			Y	X					100	100	SW NE	28	12N	11W
S05	NORTH WELL #5 WW NO TAG				X								X			Y	X					104	100	SW NE	28	12N	11W
S06	NORTH WF (SO1,2,3,4,5 & 7,8 & 9)			X									X						X		X	82	835	SW NE	28	12N	11W
S07	NORTH WELL #6 WW AGP152				X								X			Y	X					127	112	SW NE	28	12N	11W
S08	NORTH WELL #7 WW AGP148				X								X			Y	X					120	100	SW NE	28	12N	11W
S09	NORTH WELL #8 WW AGP151				X								X			Y	X					126	123	SW NE	28	12N	11W
~~S10~~	~~SOUTH WELL #1 20051/PWC S01 AGP15~~		X										X			Y			X		X	~~41~~	~~30~~	SE NE	33	12N	11W
~~S11~~	~~SOUTH WELL #2 20051/PWC S02 AGP15~~		X										X			Y			X		X	~~85~~	~~60~~	NW NE	33	12N	11W
~~S12~~	~~InAct 11/04/2008 SOUTH WELL #4 20051/P~~		X												X	Y			X		X	~~101~~	~~80~~	SE NE	33	12N	11W

S10-S12 Are no longer viable water sources due to a loss in water capacity.

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
63000 C	NORTH BEACH WATER	PACIFIC	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)	2,569	3119	Unspecified
A. Full Time Single Family Residences (Occupied 180 days or *more* per year)	~~1510~~	1,737	
B. Part Time Single Family Residences (Occupied *less than* 180 days per year)	~~1000~~	832	
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	14		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied *more than* 180 days/year	94		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied *less than* 180 days/year	425		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc. 90	~~75~~	75	
28. TOTAL SERVICE CONNECTIONS		3194	

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or *more* days per year? ~~4010~~ 4100

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?	500	500	1000	2000	2500	3000	3000	3000	3000	2000	1000	1500
B. How many days per month are they present?	30	30	30	30	30	30	30	30	30	30	30	30

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?	2200	2200	2800	3000	3600	4400	7000	7000	10000	5000	4000	5000
B. How many days per month is water accessible to the public?	30	30	30	30	30	30	30	30	30	30	30	30

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?	665	665	670	680	680	690	490	500	750	680	680	690
B. How many days per month are they present?	30	30	30	30	30	30	30	30	30	30	30	30

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	6	6	6	8	8	9	9	9	9	8	7	7

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____ DATE: _____

PRINT NAME: _____ TITLE: _____

STATE OF WASHINGTON

Public Water System

Operating Permit

The Department of Health Office of Drinking Water issues a permit to operate:

NORTH BEACH WATER (ID# 63000 C)

to owner: NORTH BEACH WATER DISTRICT County: PACIFIC

NORTH BEACH WATER DISTRICT
P.O. Box 618
Ocean Park, WA 98640

This Permit is valid through: May 2014

PERMIT CATEGORY: **** Green ****

The permit category may be modified or the permit revoked subject to water system compliance with applicable State of Washington drinking water rules and regulations and the folowing statements:

The system operating permit color category is based on information on file with the Department at the time this permit was printed.

System is substantially in compliance with applicable drinking water requirements.

Washington State Department of Health

Report Date: 05/20/2013

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 11/15/2013
Printed: 6/3/2014
WFI Printed For: On-Demand
Submission Reason: Contact Update

RETURN TO: Southwest Regional Office, PO Box 47823, Olympia, WA, 98504

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
48000 M	LONG BEACH WATER DEPARTMENT	PACIFIC	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS	7. OWNER NAME & MAILING ADDRESS	8. Owner Number 003427
JACOB M. BINION [WTPO] PO BOX 310 LONG BEACH, WA 98631	LONG BEACH, CITY OF DON ZUERN PO BOX 310 LONG BEACH, WA 98631	TITLE: OWNERS CONTACT
STREET ADDRESS IF DIFFERENT FROM ABOVE	**STREET ADDRESS IF DIFFERENT FROM**	
ATTN ADDRESS CITY STATE ZIP	ATTN ADDRESS 115 BOLSTAD AVE CITY LONGBEACH STATE WA ZIP 98631	

9. 24 HOUR PRIMARY CONTACT INFORMATION	10. OWNER CONTACT INFORMATION
Primary Contact Daytime Phone: (360) 642-3163	Owner Daytime Phone: (360) 642-2203
Primary Contact Mobile/Cell Phone: (360) 244-3818	Owner Mobile/Cell Phone: (360) 244-3818
Primary Contact Evening Phone: (xxx) xxx-xxxx	Owner Evening Phone: (xxx) xxx-xxxx
Fax: | E-mail: XXXXXX	Owner Fax Phone: | E-mail: XXXXXX

WAC 246-290-420(9) requires that water systems provide 24-hour contact information for emergencies.

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- [x] Not applicable (Skip to #12)
- [ ] Owned and Managed — SMA NAME: _____ SMA Number:
- [ ] Managed Only
- [ ] Owned Only

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

[ ] Agricultural	[ ] Hospital/Clinic	[x] Residential
[x] Commercial / Business	[ ] Industrial	[x] School
[ ] Day Care	[x] Licensed Residential Facility	[ ] Temporary Farm Worker
[x] Food Service/Food Permit	[x] Lodging	[x] Other (church, fire station, etc.):
[x] 1,000 or more person event for 2 or more days per year	[x] Recreational / RV Park	_____

13. WATER SYSTEM OWNERSHIP (mark only one)				14. STORAGE CAPACITY (gallons)
[ ] Association	[ ] County	[ ] Investor	[ ] Special District	
[x] City / Town	[ ] Federal	[ ] Private	[ ] State	2,000,000

15	16	17	18 SOURCE CATEGORY									19 USE			20	21 TREATMENT						22	23	24 SOURCE LOCATION			
Source Number	LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING IN SPRING FIELD	SEA WATER	SURFACE WATER	RANNEY / INF.	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	MAIN IMPOUNDMENT								X			X			Y		X				X		686	SW NW	14	10N	11
S02	REIKKOLA CREEK								X					X	N		X				X		450	SW SE	14	10N	11
S03	MATTICKS CREEK								X				X		N		X	X			X		125	SW NW	14	10N	11
S04	DOHMAN RESERVOIR								X			X			Y		X				X		660	SE SE	14	10N	11
S05	35500/ILWACO	35500 2												X	Y	X							800	SW SE	28	10N	11

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
48000 M	LONG BEACH WATER DEPARTMENT	PACIFIC	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED CONNECTIONS
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)	0	1835	Unspecified
A. Full Time Single Family Residences (Occupied 180 days or more per year)	1835		
B. Part Time Single Family Residences (Occupied less than 180 days per year)	0		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	0		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year	0		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied less than 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	238	238	
28. TOTAL SERVICE CONNECTIONS		2073	

29. FULL-TIME RESIDENTIAL POPULATION	
A. How many residents are served by this system 180 or more days per	3854

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												
31. TEMPORARY & TRANSIENT USERS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?	3000	3000	3000	3000	3000	15000	15000	15000	15000	3000	3000	3000
B. How many days per month is water accessible to the public?	30	30	30	30	30	30	30	30	30	30	30	30
32. REGULAR NON-RESIDENTIAL USERS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?	500	500	500	500	500	500	500	500	500	500	500	500
B. How many days per month are they present?	30	30	30	30	30	30	30	30	30	30	30	30

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	5	5	5	5	5	5	5	5	5	5	5	5

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____
DATE: _____

PRINT NAME: _____
TITLE: _____

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 11/06/2013
Printed: 6/3/2014
WFI Printed For: On-Demand
Submission Reason: Other

RETURN TO: Southwest Regional Office, PO Box 47823, Olympia, WA, 98504

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
86470 Y	SURFSIDE HOMEOWNERS	PACIFIC	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS	7. OWNER NAME & MAILING ADDRESS	8. Owner Number 005858
WILLIAM M. NEAL III [MANAGER] 31402 H STREET OCEAN PARK, WA 98640	SURFSIDE HOMEOWNERS ASSOC. LAURA FRAZIER 31402 H STREET OCEAN PARK, WA 98640	TITLE: BUSINESS MANAGER
STREET ADDRESS IF DIFFERENT FROM ABOVE	**STREET ADDRESS IF DIFFERENT FROM**	
ATTN ADDRESS CITY STATE ZIP	ATTN ADDRESS CITY STATE ZIP	

9. 24 HOUR PRIMARY CONTACT INFORMATION	10. OWNER CONTACT INFORMATION
Primary Contact Daytime Phone: (360) 665-4144	Owner Daytime Phone: (360) 665-4171
Primary Contact Mobile/Cell Phone: (360) 244-0068	Owner Mobile/Cell Phone: (360) 783-2393
Primary Contact Evening Phone: (xxx) xxx-xxxx	Owner Evening Phone: (xxx) xxx-xxxx
Fax:(360) 665-4641 | E-mail: XXXXXX	Owner Fax Phone: | E-mail: XXXXXX

WAC 246-290-420(9) requires that water systems provide 24-hour contact information for emergencies.

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- [x] Not applicable (Skip to #12)
- [ ] Owned and Managed
- [ ] Managed Only
- [ ] Owned Only

SMA NAME: _____ SMA Number:

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

[ ] Agricultural	[ ] Hospital/Clinic	[x] Residential
[x] Commercial / Business	[ ] Industrial	[ ] School
[ ] Day Care	[ ] Licensed Residential Facility	[ ] Temporary Farm Worker
[ ] Food Service/Food Permit	[x] Lodging	[ ] Other (church, fire station, etc.):
[ ] 1,000 or more person event for 2 or more days per year	[ ] Recreational / RV Park	

13. WATER SYSTEM OWNERSHIP (mark only one)				14. STORAGE CAPACITY (gallons)
[ ] Association	[ ] County	[ ] Investor	[ ] Special District	
[ ] City / Town	[ ] Federal	[x] Private	[ ] State	630,000

- SEE NEXT PAGE FOR A COMPLETE LIST OF SOURCES -

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
86470 Y	SURFSIDE HOMEOWNERS	PACIFIC	A	Comm

15	16	17	18										19			20	21						22	23	24			
	SOURCE NAME	INTERTIE	SOURCE CATEGORY										USE				TREATMENT						DEPTH		SOURCE LOCATION			
Source Number	LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL	SPRING	SPRING IN SPRING FIELD	SEA WATER	SURFACE WATER	RANNEY / INF.	OTHER		PERMANEANT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S03	WELL J-1 WW		X												X	Y		X	X				193	120	SW NW	09	12N	11W
S06	WELL J-2A AGP128 WW				X									X		Y	X						192	175	SW NW	09	12N	11W
S07	WELL J-3 AGP129 WW				X									X		Y	X						192	175	SW NW	09	12N	11W
S08	WELL J-4 AGP130 WW				X								X			Y	X						182	175	SW NW	09	12N	11W
S09	WELL J-5 AGP131 WW				X								X			Y	X						182	175	SW NW	09	12N	11W
S11	WF (S6,7,8,9,12,13)Deep J Wells			X									X			Y		X	X			X	182	820	SW NW	09	12N	11W
S12	WELL J-6 AGP132 WW				X								X			Y	X						180	160	SW NW	09	12N	11W
S13	WELL J-7 AGP133 WW				X								X			Y	X						180	160	SW NW	09	12N	11W

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
86470 Y	SURFSIDE HOMEOWNERS	PACIFIC	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED CONNECTIONS
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)	0	1263	Unspecified
A. Full Time Single Family Residences (Occupied 180 days or more per year)	552		
B. Part Time Single Family Residences (Occupied less than 180 days per year)	679		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	5		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year	32		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied less than 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	948	948	
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	6	6	
28. TOTAL SERVICE CONNECTIONS		2217	

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per [illegible]? 1405

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?	300	300	400	800	1700	1800	1800	2000	1800	800	400	800
B. How many days per month are they present?	30	30	30	30	30	30	30	30	30	30	30	30

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?	2000	2000	2500	3000	5000	6000	8000	8000	10000	8000	7000	7000
B. How many days per month is water accessible to the public?	30	30	30	30	30	30	30	30	30	30	30	30

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?												
B. How many days per month are they present?												

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	2	2	2	2	3	4	4	4	4	2	2	2

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____
DATE: _____

PRINT NAME: _____
TITLE: _____

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 2
Updated: 06/14/2013
Printed: 6/3/2014
WFI Printed For: On-Demand
Submission Reason: Other

RETURN TO: Southwest Regional Office, PO Box 47823, Olympia, WA, 98504

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
29240 X	OYSTERVILLE	PACIFIC	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS	7. OWNER NAME & MAILING ADDRESS	8. Owner Number 011206
MARK H. CLEMMENS [OPERATOR] PO BOX 7 OYSTERVILLE, WA 98641	OYSTERVILLE WATER NP CORP CAROL NORDQUIST PO BOX 81 OYSTERVILLE, WA 98641	TITLE: TREASURER
STREET ADDRESS IF DIFFERENT FROM ABOVE	**STREET ADDRESS IF DIFFERENT FROM**	
ATTN ADDRESS 32700 DOUGLAS DR CITY OYSTERVILLE STATE WA ZIP 98641	ATTN ADDRESS 33302 TERRITORY RD CITY OYSTERVILLE STATE WA ZIP 98641	

9. 24 HOUR PRIMARY CONTACT INFORMATION	10. OWNER CONTACT INFORMATION
Primary Contact Daytime Phone: (360) 665-4807	Owner Daytime Phone: (360) 665-5521
Primary Contact Mobile/Cell Phone: (360) 244-1528	Owner Mobile/Cell Phone:
Primary Contact Evening Phone: (xxx) xxx-xxxx	Owner Evening Phone: (xxx) xxx-xxxx
Fax:(360) 665-4807 | E-mail: XXXXXX	Owner Fax Phone: | E-mail: XXXXXX

WAC 246-290-420(9) requires that water systems provide 24-hour contact information for emergencies.

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- [x] Not applicable (Skip to #12)
- [ ] Owned and Managed — SMA NAME: _____ SMA Number:
- [ ] Managed Only
- [ ] Owned Only

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

[ ] Agricultural	[ ] Hospital/Clinic	[x] Residential
[x] Commercial / Business	[ ] Industrial	[ ] School
[ ] Day Care	[ ] Licensed Residential Facility	[ ] Temporary Farm Worker
[x] Food Service/Food Permit	[ ] Lodging	[ ] Other (church, fire station, etc.):
[ ] 1,000 or more person event for 2 or more days per year	[ ] Recreational / RV Park	

13. WATER SYSTEM OWNERSHIP (mark only one)				14. STORAGE CAPACITY (gallons)
[x] Association	[ ] County	[ ] Investor	[ ] Special District	
[ ] City / Town	[ ] Federal	[ ] Private	[ ] State	60,000

15	16	17	18										19			20	21						22	23	24			
	SOURCE NAME	INTERTIE	SOURCE CATEGORY										USE				TREATMENT						DEPTH		SOURCE LOCATION			
Source Number	LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING IN SPRING FIELD	SEA WATER	SURFACE WATER	RANNEY / INF.	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	WELL #2 8"		X									X			Y		X					69	40	SW SW	10	12N	11

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
29240 X	OYSTERVILLE	PACIFIC	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED CONNECTIONS
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)	0	68	99
A. Full Time Single Family Residences (Occupied 180 days or more per year)	26		
B. Part Time Single Family Residences (Occupied less than 180 days per year)	42		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	0		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year	0		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied less than 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	0
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	1	1	0
28. TOTAL SERVICE CONNECTIONS		69	99

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per ___ 70 ___

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?	10	10	10	10	10	25	25	25	25	10	10	10
B. How many days per month are they present?	5	5	5	5	10	10	10	10	10	5	5	5

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?	90	90	90	90	90	90	90	90	90	90	90	90
B. How many days per month is water accessible to the public?	20	20	20	20	20	20	20	20	20	20	20	20

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?	2	2	2	2	2	2	2	2	2	2	2	2
B. How many days per month are they present?	20	20	20	20	20	20	20	20	20	20	20	20

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	1	1	1	1	1	1	1	1	1	1	1	1

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____
DATE: _____

PRINT NAME: _____
TITLE: _____

APPENDIX B

WATER RIGHTS DOCUMENTS

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Table 1

WATER SYSTEM PLAN
WATER RIGHTS SELF ASSESSMENT – EXISTING STATUS

PERMIT CERTIFICATE OR CLAIM #	NAME ON DOCUMENT	PRIORITY DATE (List oldest first)	SOURCE NAME/ NUMBER	ANY PORTION NON-ADDITIVE? (If yes, explain in footnote)	EXISTING WATER RIGHTS		EXISTING CONSUMPTION		CURRENT WATER RIGHT STATUS (Excess/Deficiency)	
					Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
Permits/Certificates										
1. G2-00174C	Pacific Water Company, Inc	12/15/1969	S-1, S-2, S-4	No	500 gpm	168 AFY (1)	170 gpm (3)	153 AFY (2)	330 gpm	15 AFY (2)
2. G2-00759C	Ocean Park Water Company	7/14/1965	N-1, N-2, N-7, N-8	No	200 gpm	320 AFY	200 gpm (3)	129 AFY (2)	0 gpm	191 AFY (2)
3. G2-21399C	Ocean Park Water Company	8/23/1973	N-3, N-6	Yes, 32 AFY	100 gpm	160 AFY (4)	100 gpm (3)	121 AFY (2)	0 gpm	39 AFY (2)
4. G2-25737C	Ocean Park Water Company	10/22/1980	N-4	Yes, 140 AFY	130 gpm	140 AFY (5)	130 gpm (3)	115 AFY (2)	0 gpm	25 AFY (2)
5. G2-27073C	Ocean Park Water Company	3/16/1987	N-5	Yes, 252 AFY	105 gpm	252 AFY (6)	105 gpm (3)	56 AFY (2)	0 gpm	196 AFY (2)
6. G2-29907P	North Beach Water	2/10/2000	N-3, N-4, N-5, N-6, N-7, N-8	No	65 gpm	80 AFY	65 gpm (3)	70 AFY (2)	0 gpm	10 AFY (2)
Claims										
1.										
TOTAL	**********	**********	**********	**********	1,100 gpm	696 AFY (7)	995 gpm	428 AFY (8)	330 gpm	268 AFY (8)

(1) AFY is Acre-Feet per Year.
(2) Maximum annual withdrawal is shown for the combination of wells that fall under the indicated water rights. However, many of these wells withdraw under multiple rights such that total withdrawal under each right is not exceeded.
(3) Includes installed capacity of multiple wells operating under this right. Some wells operate under multiple rights such that the total withdrawal under each right does not exceed any limit.
(4) Certificate G2-21399C limits 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 or non-additive.
(5) 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." Rights G2-00759 and G2-21399 already limited total withdrawals to 448 ac-ft/yr, so the effect is that all rights in G2-25737 are non-additive.
(6) Certificate G2-27073C indicates that the entire annual amount of 252 AFY is supplemental, or non-additive.
(7) Additive portions of annual water rights sum to 696 AFY
(8) Maximum total annual withdrawal is not the sum of maximum withdrawals for individual rights listed above because (a) maximum annual withdrawals under various rights did not occur in the same year, and (b) some wells withdrawals are counted under multiple rights.

INTERTIE NAME/ IDENTIFIER	NAME OF PURVEYOR PROVIDING WATER	EXISTING LIMITS ON INTERTIE USE		FORECASTED CONSUMPTION THROUGH INTERTIE		FORECASTED INTERTIE SUPPLY STATUS (Excess/Deficiency)	
		Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
1.							
TOTAL	**********						

PENDING WATER RIGHT	NAME ON APPLICATION	DATE	ANY PORTION	PENDING WATER RIGHTS

APPLICATION (New/Change)		SUBMITTED	SUPPLEMENTAL? (If yes, explain in footnote)	Maximum Instantaneous Flow Rate (Qi) Requested	Maximum Annual Volume (Qa) Requested
1.					

If you need this publication in an alternate format, call (800) 525-0127. For TTY/TDD call (800) 833-6388.

DOH Form 331-371 (Updated 08/10)

To return form, please see reverse side.

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Table 2

WATER SYSTEM PLAN
WATER RIGHTS SELF ASSESSMENT – 6 YEAR FORECAST

PERMIT CERTIFICATE OR CLAIM #	NAME ON DOCUMENT	PRIORITY DATE (List oldest first)	SOURCE NAME/ NUMBER	ANY PORTION NON-ADDITIVE? (If yes, explain in footnote)	EXISTING WATER RIGHTS		FORECASTED WATER USE FROM SOURCES (6-year Demand)		FORECASTED WATER RIGHT STATUS (Excess/Deficiency)	
					Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
Permits/Certificates										
1. G2-00174C	Pacific Water Company, Inc	12/15/1969	SW-1, SW-2, SW-3	No	500 gpm	168 AFY (1)	450 gpm (2)	51 AFY	50 gpm	117 AFY
2. G2-00759C	Ocean Park Water Company	7/14/1965	N-1, N-2, N-7, N-8	No	200 gpm	320 AFY	200 gpm (3)	98 AFY	0 gpm	222 AFY
3. G2-21399C	Ocean Park Water Company	8/23/1973	N-3, N-6	Yes, 32 AFY	100 gpm	160 AFY (4)	100 gpm (3)	49 AFY	0 gpm	111 AFY (9)
4. G2-25737C	Ocean Park Water Company	10/22/1980	N-4	Yes, 140 AFY	130 gpm	140 AFY (5)	130 gpm	43 AFY	0 gpm	97 AFY (9)
5. G2-27073C	Ocean Park Water Company	3/16/1987	N-5	Yes, 252 AFY	105 gpm	252 AFY (6)	105 gpm	77 AFY	0 gpm	175 AFY (9)
6. G2-29907P	North Beach Water	2/10/2000	N-3, N-4, N-5, N-6, N-7, N-8	No	65 gpm	80 AFY	65 gpm (3)	25 AFY	0 gpm	55 AFY
Claims										
1.										
TOTAL	**********	**********	**********	**********	1,100 gpm	696 AFY (7)	1,050 gpm (8)	343 AFY		353 AFY (9)

(1) AFY is Acre-Feet per Year.
(2) Forecast is anticipated pumping capacity of new Wiegardt Wells 1, 2, and 3.
(3) Includes installed capacity of multiple wells operating under this right. Some wells operate under multiple rights such that the total withdrawal under each right does not exceed any limit.
(4) Certificate G2-21399C limits 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 or non-additive.
(5) 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." Rights G2-00759 and G2-21399 already limited total withdrawals to 448 ac-ft/yr, so the effect is that all rights in G2-25737 are non-additive.
(6) Certificate G2-27073C indicates that the entire annual amount of 252 AFY is supplemental, or non-additive.
(7) Additive portions of annual water rights sum to 696 AFY
(8) Because some wells withdraw under multiple rights, the sum of installed withdrawal capacities under all rights exceed actual installed capacity. Actual installed capacities and operations do not exceed total water rights available.
(9) Excess/Deficiency of rights is shown based on total annual withdrawal available under each right, whether additive or non-additive. Therefore, total Excess/Deficiency does not equal the sum of the Excess/Deficiency values for each right.

INTERTIE NAME/ IDENTIFIER	NAME OF PURVEYOR PROVIDING WATER	EXISTING LIMITS ON INTERTIE USE		FORECASTED CONSUMPTION THROUGH INTERTIE		FORECASTED INTERTIE SUPPLY STATUS (Excess/Deficiency)	
		Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
1.							

TOTAL	**********							
PENDING WATER RIGHT APPLICATION (New/Change)	NAME ON APPLICATION	DATE SUBMITTED	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	PENDING WATER RIGHTS				
				Maximum Instantaneous Flow Rate (Qi) Requested		Maximum Annual Volume (Qa) Requested		
1.								

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DOH Form 331-372 (Updated 08/10)

To return form, please see reverse side.

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Table 3

WATER SYSTEM PLAN
WATER RIGHTS SELF ASSESSMENT – 20 YEAR FORECAST

PERMIT CERTIFICATE OR CLAIM #	NAME ON DOCUMENT	PRIORITY DATE (List oldest first)	SOURCE NAME/ NUMBER	ANY PORTION NON-ADDITIVE? (If yes, explain in footnote)	EXISTING WATER RIGHTS		FORECASTED WATER USE FROM SOURCES (20-year Demand)		FORECASTED WATER RIGHT STATUS (Excess/Deficiency)	
					Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
Permits/Certificates										
1. G2-00174C	Pacific Water Company, Inc	12/15/1969	SW-1, SW-2, SW-3	No	500 gpm	168 AFY (1)	450 gpm (2)	54 AFY	50 gpm	114 AFY
2. G2-00759C	Ocean Park Water Company	7/14/1965	N-1, N-2, N-7, N-8	No	200 gpm	320 AFY	200 gpm (3)	102 AFY	0 gpm	218 AFY
3. G2-21399C	Ocean Park Water Company	8/23/1973	N-3, N-6	Yes, 32 AFY	100 gpm	160 AFY (4)	100 gpm (3)	51 AFY	0 gpm	109 AFY (9)
4. G2-25737C	Ocean Park Water Company	10/22/1980	N-4	Yes, 140 AFY	130 gpm	140 AFY (5)	130 gpm	45 AFY	0 gpm	95 AFY (9)
5. G2-27073C	Ocean Park Water Company	3/16/1987	N-5	Yes, 252 AFY	105 gpm	252 AFY (6)	105 gpm	80 AFY	0 gpm	172 AFY (9)
6. G2-29907P	North Beach Water	2/10/2000	N-3, N-4, N-5, N-6, N-7, N-8	No	65 gpm	80 AFY	65 gpm (3)	25 AFY	0 gpm	55 AFY
Claims										
1.										
TOTAL	**********	**********	**********	**********	1,100 gpm	696 AFY (7)	1,050 gpm (8)	357 AFY	50 gpm	339 AFY (9)

(1) AFY is Acre-Feet per Year.
(2) Forecast is anticipated pumping capacity of new Wiegardt Wells 1, 2, and 3.
(3) Includes installed capacity of multiple wells operating under this right. Some wells operate under multiple rights such that the total withdrawal under each right does not exceed any limit.
(4) Certificate G2-21399C limits 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 or non-additive.
(5) 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." Rights G2-00759 and G2-21399 already limited total withdrawals to 448 ac-ft/yr, so the effect is that all rights in G2-25737 are non-additive.
(6) Certificate G2-27073C indicates that the entire annual amount of 252 AFY is supplemental, or non-additive.
(7) Additive portions of annual water rights sum to 696 AFY
(8) Because some wells withdraw under multiple rights, the sum of installed withdrawal capacities under all rights exceed actual installed capacity. Actual installed capacities and operations do not exceed total water rights available.
(9) Excess/Deficiency of rights is shown based on total annual withdrawal available under each right, whether additive or non-additive. Therefore, total Excess/Deficiency does not equal the sum of the Excess/Deficiency values for each right.

INTERTIE NAME/ IDENTIFIER	NAME OF PURVEYOR PROVIDING WATER	EXISTING LIMITS ON INTERTIE USE		FORECASTED CONSUMPTION THROUGH INTERTIE		FORECASTED INTERTIE SUPPLY STATUS (Excess/Deficiency)	
		Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)

1.								
TOTAL	**********							

PENDING WATER RIGHT APPLICATION (New/Change)	NAME ON APPLICATION	DATE SUBMITTED	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	PENDING WATER RIGHTS	
				Maximum Instantaneous Flow Rate (Qi) Requested	Maximum Annual Volume (Qa) Requested
1.					

If you need this publication in an alternate format, call (800) 525-0127. For TTY/TDD call (800) 833-6388.

DOH Form 331-373 (Updated 08/10)

To return form, please see reverse side.

Pacific Water Company Inc
PO Box 683
Longbeach, Washington 98631-0683

WASHINGTON STATE DEPARTMENT OF ECOLOGY

STATE OF WASHINGTON
CERTIFICATE OF WATER RIGHT
SUPERSEDING

Document Title: Certificate of Water Right

Agency: Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Applicant: Pacific Water Company Inc
PO Box 683
Longbeach, WA 98631-0683

Reference Number:

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
December 15, 1969	G2-00174	G2-00174	G2-00174

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE	TRIBUTARY OF (IF SURFACE WATERS)
3 Wells	

MAX. CUBIC FEET PER SECOND	MAX. GALLONS PER MINUTE	MAX. ACRE-FEET PER YEAR
	500	168

QUANTITY/TYPE OF USE/PERIOD OF USE

168 Acre-feet per year Multiple domestic supply Year-round, as needed

LEGAL DESCRIPTION OF LOCATION OF DIVERSION/WITHDRAWAL

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY
N1/2 NE1/4	33	12	11W	24	Pacific

PARCEL # N/A

ADDITIONAL LEGAL IS ON PAGE 2

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY
N/A	N/A	N/A	N/A	24	Pacific

PARCEL # N/A

ADDITIONAL LEGAL IS ON PAGE 2

CONTINUED LEGAL DESCRIPTION FOR LOCATION OF DIVERSION/WITHDRAWAL

Well #1 - 780 feet West and 1300 feet South of the Northeast corner of Section 33.

Well #2 - 1970 feet West and 810 feet South of the Northeast corner of Section 33.

Well #3 - 2070 feet West and 910 feet South of the Northeast corner of Section 33.

CONTINUED LEGAL DESCRIPTION FOR PROPERTY ON WHICH WATER IS TO BE USED

The plats of Rushton-on-the-Bay; Rushlight Farm Estates; and South addition of Ocean Park; all within Section 33, T. 12 N., R. 11 W.W.M.

PROVISIONS

All conditions and requirements contained in reports of examination or permits previously issued apply to this certificate unless specifically noted below.

"The combined withdrawal rate from Wells #1, #2 and #4 may at no time exceed 500 gpm. The annual withdrawal from all three wells is limited to 168 acre-feet per year."

The well access port shall be maintained at all times.

An approved metering device shall be installed and maintained in accordance with RCW 90.03.360, 90.44.450 and WAC 508-64-020 through –040, and WAC 508-12-030. Meter readings shall be recorded at least monthly.

The right to use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.100.

This certificate of water right is specifically subject to relinquishment for non-use of water as provided in Chapter 90.14 RCW.

Given under my hand and the seal of this office at Olympia, Washington, this 6th *day of* December, *1999.*

DEPARTMENT OF ECOLOGY
STATE OF WASHINGTON

Tom Fitzsimmons
Department of Ecology

By _____
J. Mike Harris, Section Supervisor

ENGINEERING DATA
OK _____
ECY 040-1-2 (Rev. 8-97)

THOMAS J. FRARE
PROFESSIONAL ENGINEER • WATER & SEWER SYSTEMS
3227 - 74th Avenue S.E. Olympia, WA 98501 – 360-459-3159

ENTERED
3-6-00
Paid CK 9656

March 2, 2000

Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

SUBJECT: Water Rights Application
Ocean Park Water Company
Pacific County, Washington

Attached is an application to increase the water rights for the Ocean Park Water Company by 65 gpm. The water system currently has 8 wells with a combined water right of 535 gpm. The expansion is necessary to accommodate the growth projected in the current water system plan.

We would like the ability to draw the additional water from the 4 wells (1, 2, 7 & 8) currently authorized under water right G2-00759C. The wells are installed and equipped and no additional construction is necessary.

Thank you for your assistance in this matter. If you have any question please give me a call.

Sincerely

Thomas J. Frare, P.E.

cc: Pete Christoson, Ocean Park Water Company, Inc.

Ocean Park Water Company
PO Box 618
Ocean Park, Washington 98640-0618

WASHINGTON STATE DEPARTMENT OF ECOLOGY

STATE OF WASHINGTON
CERTIFICATE OF WATER RIGHT
SUPERSEDING

Document Title: Certificate of Water Right

Agency: Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Applicant: Ocean Park Water Company
PO Box 618
Ocean Park, WA 98640-0618

Reference Number:

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
July 14, 1965	G2-00759	G2-00759	G2-00759

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE	TRIBUTARY OF (IF SURFACE WATERS)
Four Wells (1, 2, 7 and 8)	

MAX. CUBIC FEET PER SECOND	MAX. GALLONS PER MINUTE	MAX. ACRE-FEET PER YEAR
	200	320

QUANTITY/TYPE OF USE/PERIOD OF USE

320 Acre-feet per year Multiple domestic supply Year-round, as needed

LEGAL DESCRIPTION OF LOCATION OF DIVERSION/WITHDRAWAL

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW¼ NE¼	28	12	11W	24	Pacific

PARCEL # Well #7 – 1878 and Well #8 – 23256

ADDITIONAL LEGAL IS ON PAGE 2

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY
N/A	N/A	N/A	N/A	24	Pacific

PARCEL # N/A

ADDITIONAL LEGAL IS ON PAGE 2

3016065 03/18/1998 01:53P PG 1 OF 2 THOMAS FRARE
Ida Taylor, Auditor Pacific County Auditor's Office MISC - $9.00

CONTINUED LEGAL DESCRIPTION FOR LOCATION OF DIVERSION/WITHDRAWAL

Wells 1 & 2: 830 feet East and 315 feet North of the Center of Section 28,

Well 7: 534 feet East and 295 feet North of the Center of Section 28,

Well 8: 365 feet East and 325 feet North of the Center of Section 28.

CONTINUED LEGAL DESCRIPTION FOR PROPERTY ON WHICH WATER IS TO BE USED

Area served by Ocean Park Water Company.

PROVISIONS

All conditions and requirements contained in reports of examination or permits previously issued apply to this certificate unless specifically noted below.

The well access port shall be maintained at all times.

An approved metering device shall be installed and maintained in accordance with RCW 90.03.360, 90.44.450 and WAC 508-64-020 through -040. Meter readings shall be recorded at least monthly.

All wells constructed in the State shall meet the construction requirements of Chapter 173-160 WAC entitled "Minimum Standards for the Construction and Maintenance of Wells" and Chapter 18-104 RCW entitled "Water Well Construction, Act (1971)."

The right to use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.100.

This certificate of water right is specifically subject to relinquishment for non-use of water as provided in Chapter 90.14 RCW.

Given under my hand and the seal of this office at Olympia, Washington, this 17th *day of* March, *1998.*

DEPARTMENT OF ECOLOGY
STATE OF WASHINGTON

Tom Fitzsimmons
Department of Ecology

By _____
J. Mike Harris, Section Supervisor

ENGINEERING DATA
OK _____
ECY 040-1-2 (Rev. 8-97)

State of Washington
Application for a Water Right

Please follow the attached instructions to avoid unnecessary delays.

For Ecology Use
Fee Paid _____
Date _____

Section 1. APPLICANT - PERSON, ORGANIZATION, OR WATER SYSTEM

Name Ocean Park Water Company, Inc Home Tel: (____)____ - ____
Mailing Address P.O. Box 618 Work Tel: (360) 665 - 4144
City Ocean Park State WA Zip+4 98 _+ ____ FAX: (360) 665 - 4661

Section 2. CONTACT - PERSON TO CALL ABOUT THE APPLICATION

☐ Same as above

Name Thomas J. Frare Home Tel: (360) 459 - 3159
Mailing Address 3227 74th Avenue S.E. Work Tel: (360) 459 - 3159
City Olympia State WA Zip+4 98501 + ____ FAX: (____)____ - ____
Relationship to applicant Engineer

Section 3. STATEMENT OF INTENT

The applicant requests a permit to use not more than 65 (☒ gallons per minute or ☐ cubic feet per second) from a ☐ surface water source or ☒ ground water source (check only one) for the purpose(s) of Domestic / Community Water System. **ATTACH A "LEGAL" DESCRIPTION OF THE PLACE OF USE.** (See instructions.) *NOTE: A tax parcel number or a plat number is not sufficient.* SERVICE AREA
Estimate a maximum annual quantity to be used in acre-foot per year: 80

☐ Check if the water use is proposed for a short-term project. Indicate the period of time that the water will be needed:

From ___/___/___ to ___/___/___

Section 4. WATER SOURCE

If SURFACE WATER	If GROUNDWATER
Name the water source and indicate if stream, spring, lake, etc. If unnamed, write "unnamed spring," "unnamed stream," etc.: Number of diversions: _____	A permit is desired for _____ well(s). Addition volume from wells 1,2,7,8 under permit #G2-00759C
Source flows into (name of body of water):	Size & depth of well(s): #1 - 8"-102', #2-6"-122', #7-6"-120', #8-8"-116

LOCATION

Enter the north-south and east-west distances in feet from the point of diversion or withdrawal to the nearest section corner: on file shown on G2-00759C

1/4 of	1/4 of	Section	Township	Range (E/W)	County	If location of source is platted, complete below: Lot	Block	Subdivision

For Ecology Use Date Received: _____ Priority Date: _____
SEPA: Exempt/Not Exempt FERC License # _____ Dept. Of Health # _____
Date Accepted As Complete _____ By _____ Date Returned _____ By _____ WRIA: _____

Section 5. GENERAL WATER SYSTEM INFORMATION

A. Name of system, if named: Ocean Park Water Company

B. Briefly describe your proposed water system. (See instructions.)

The system currently has 8 wells which pump to storage and is in turn repumped to the system. Water rights exist for 535 GPM and maximum annual of 448 acre-feet primary right.

C. Do you already have any water rights or claims associated with this property or system? ☒ YES ☐ NO
PROVIDE DOCUMENTATION. G2-00759C, G2-21399C, G2-25737C, G2-27073C

Section 6. DOMESTIC/PUBLIC WATER SUPPLY SYSTEM INFORMATION
(Completed for all domestic/public supply uses.)

A. Number of "connections" requested: As per water system plan Type of connection Mixed
(Homes, Apartment, Recreational, etc.)

B. Are you within the area of an approved water system? ☐ YES ☐ NO
If yes, explain why you are unable to connect to the system. *Note: Regional water systems are identified by your County Health Department.*

Complete C. and D. only if the proposed water system will have fifteen or more connections.

C. Do you have a current water system plan approved by the Washington State Department of Health? ☒ YES ☐ NO
If yes, when was it approved? Pending Please attach the current approved version of your plan.

D. Do you have an approved conservation plan? ☒ YES ☐ NO
If yes, when was it approved? Pending Please attach the current approved version of your plan.

Section 7. IRRIGATION/AGRICULTURAL/FARM INFORMATION
(Completed for all irrigation and agriculture uses.)

A. Total number of acres to be irrigated: _____

B. List total number of acres for other specified agricultural uses:

Use _____ Acres _____
Use _____ Acres _____
Use _____ Acres _____

C. Total number of acres to be covered by this application: _____

D. Family Farm Act (Initiative Measure Number 59, November 3, 1977)
Add up the acreage in which you have a controlling interest, including only:
‡ Acreage irrigated under water rights acquired after December 8, 1977;
‡ Acreage proposed to be irrigated under this application;
‡ Acreage proposed to be irrigated under other pending application(s).

1. Is the combined acreage greater than 2000 acres? ☐ YES ☐ NO
2. Do you have a controlling interest in a Family Farm Development Permit? ☐ YES ☐ NO
If yes, enter permit no.: _____

E. Farm uses:
Stockwater - Total # of animals _____ Animal Type _____ (If dairy cattle, see below)
Dairy - # Milking _____ # Non-milking _____

Section 8. WATER STORAGE

Will you be using a dam, dike, or other structure to retain or store water? ☒YES ☐NO
3 CONCRETE ABOVE GROUND RESERVOIRS for a total of 537,000 gallons

NOTE: If you will be storing 10 acre-feet or more of water and/or if the water depth will be 10 feet or more at the deepest point, and some portion of the storage will be above grade, you must also apply for a reservoir permit. You can get a reservoir permit application from the Department of Ecology.

Section 9. DRIVING DIRECTIONS

Provide detailed driving instructions to the project site.
EXICTING well field. FROM SR103 & BAY AVENUE IN OCEAN PARK PROCEED NORTH ON VERNON AVE. about ½ mile; turn RIGHT ON 270th for ¼ mile; turn left of "U" st. one block; turn RIGHT ON 272ND to wellfield on RIGHT.

Section 10. REQUIRED MAP

A. Attach a map of the project. (See instructions.)
on file with water right G2-00759 C

Section 11. PROPERTY OWNERSHIP

A. Does the applicant own the land on which the water will be used? ☐YES ☒NO
If no, explain the applicant's interest in the place of use and provide the name(s) and address(es) of the owner(s):
WATER SERVICE AREA

B. Does the applicant own the land on which the water source is located? ☒YES ☐NO
If no, submit a copy of agreement:

I certify that the information above is true and accurate to the best of my knowledge. I understand that in order to process my application, I grant staff from the Department of Ecology access to the site for inspection and monitoring purposes. Even though I may have been assisted in the preparation of the above application by the employees of the Department of Ecology, all responsibility for the accuracy of the information rests with me.

Applicant (or authorized representative) — Date: 3-06-00

SAME SERVICE AREA
Landowner for place of use (if same as applicant, write "same") — Date

Use this page to continue your answers to any questions on the application. Please indicate section number before answer.

We are returning your application for the following reason(s):	
_____ Examination fee was not enclosed	APPLICANT PLEASE RETURN TO CASHIER, PO BOX 5128, LACEY, WA 98509-5128
_____ Section number(s) _____ is/are incomplete	APPLICANT PLEASE RETURN TO THE APPROPRIATE REGIONAL OFFICE
Explanation:	
Please provide the additional information requested above and return your application by _____ _____ *(date).*	

Ecology staff _____ Date _____

Ecology is an Equal Opportunity and Affirmative Action employer.

To receive this document in alternative format, contact the Water Resources Program at (360) 407-6604 (Voice) or (360) 407-6006 (TDD).

86019

S. F. No. 7361—(Rev. 6-70).

CERTIFICATE RECORD NO. -, PAGE NO. G 2-00759 C

WECCS #1 & 2

STATE OF WASHINGTON, COUNTY OF Pacific

CERTIFICATE OF GROUND WATER RIGHT

(Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology thereunder.)

THIS IS TO CERTIFY *That* OCEAN PARK WATER COMPANY

of Ocean Park, Washington, *has made proof to the satisfaction of the Department of Ecology of a right to the use of the public ground waters of the State of Washington from* two (2) wells

located within SE¼SW¼NE¼

Sec. 28, *Twp.* 12 N., *R.* 11 W.W.M.,

for the purpose(s) of municipal supply

under and specifically subject to provisions contained in Ground Water Permit No. 7301

issued by the Department of Ecology and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the Department of Ecology and entered of record in Volume - *at page* G 2-00759 C / *; that the priority of the right hereby confirmed dates from* July 14, 1965 *: that the quantity of ground water under the right hereby confirmed for the aforesaid purposes, is limited to an amount actually beneficially used for said purposes, and shall not exceed* 200 gallons per minute; 320 acre-feet per year, during entire year for municipal supply.

A description of the lands to which such ground water right is appurtenant is as follows:

Area served by Ocean Park Water Company.

RECEIVED
'73 NOV 26 AM 9:33
VERNA JACOBSON
PACIFIC COUNTY AUDITOR

The right to use of water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390 and 90.44.020.

This certificate of ground water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

DEPARTMENT OF ECOLOGY STATE OF WASHINGTON

Given under my hand and seal of this office at Olympia, Washington, this 16th *day of* November, *19* 73.

JOHN A. BIGGS, *Director*
Department of Ecology

by R. Jerry Bollen
R. JERRY BOLLEN, Assistant Director

Engineering Data
OK JM

VOL 262 PAGE 494

Ground Water Permit No. 7301

Certificate of Ground Water Right

Recorded in the Department of Ecology, Olympia, Washington, in Book No. ____ of Ground Water Right Certificates, on page G 2-00759 C, on the 16th day of November 19 73

STATE OF WASHINGTON, County of ____ } ss.

I certify that the within was received and duly recorded by me in Volume ____ of Book of Water Right Certificates, at page ____ on the ____ day of ____, 19____

____

STATE PRINTING PLANT, OLYMPIA, WASHINGTON

86019

Filed for record at the request of Dept. of Ecology
Nov. 26 A.D. 19 73, at 33 min. past 9A M. and recorded in vol. 262 of ____ page 494 records of Pacific County, Wash.
VERNA JACOBSON
County Auditor
By Violet Robbins
Deputy

Ocean Park Water Co
Herman R. Clark
P. O. Box 32
Ocean Park, Wa. 98640

Ocean Park Water Company
PO Box 618
Ocean Park, Washington 98640-0618

WASHINGTON STATE DEPARTMENT OF ECOLOGY

STATE OF WASHINGTON
CERTIFICATE OF WATER RIGHT

Document Title: Certificate of Water Right

Agency: Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Applicant: Ocean Park Water Company
PO Box 618
Ocean Park, WA 98640-0618

Reference Number:

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
August 23, 1973	G2-21399	G2-21399	G2-21399

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE	TRIBUTARY OF (IF SURFACE WATERS)
Wells #3 & #6	

MAX. CUBIC FEET PER SECOND	MAX. GALLONS PER MINUTE	MAX. ACRE-FEET PER YEAR
	100	160

QUANTITY/TYPE OF USE/PERIOD OF USE

160 Acre-feet per year | Multiple domestic supply | Year-round, as needed

LEGAL DESCRIPTION OF LOCATION OF DIVERSION/WITHDRAWAL

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW¼ NE¼	28	12	11E	24	Pacific

PARCEL # Well #3: Government Tax Lot 15, West 200', Well #6: Sailfish Parcel 01-02

ADDITIONAL LEGAL IS ON PAGE 2

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY
N/A	N/A	N/A	N/A	24	Pacific

PARCEL # N/A

ADDITIONAL LEGAL IS ON PAGE 2

CONTINUED LEGAL DESCRIPTION FOR LOCATION OF DIVERSION/WITHDRAWAL

Well #3: 870 feet East and 335 feet North of the center of Section 28.Well #6: 305 feet East and 325 feet North of the center of Section 28.

CONTINUED LEGAL DESCRIPTION FOR PROPERTY ON WHICH WATER IS TO BE USED

Area served by Ocean Park Water Company.

PROVISIONS

All conditions and requirements contained in reports of examination or permits previously issued apply to this certificate unless specifically noted below.

An approved measuring device shall be installed and maintained for each of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", Chapter 173-173 WAC.

Water use data shall be recorded monthly. The maximum rate of diversion/withdrawal and the annual total volume shall be submitted to Ecology by January 31st of each calendar year.

The following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, WRIA, Permit/Certificate/Claim No., source name, annual quantity used including units, maximum rate of diversion including units,

1. monthly meter readings including units,
2. Department of Health WFI water system number and source number(s),
3. well tag number, and period of use. In the future, Ecology may require additional parameters to be reported or more frequent reporting. Ecology prefers web based data entry, but does accept hard copies. Ecology will provide forms and electronic data entry information.

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

The right to use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.100.

This certificate of water right is specifically subject to relinquishment for non-use of water as provided in Chapter 90.14 RCW.

Given under my hand and the seal of this office at Olympia, Washington, this 2nd *day of* December, *2002.*

DEPARTMENT OF ECOLOGY
STATE OF WASHINGTON

Tom Fitzsimmons, Director
Department of Ecology

By _____
J. Mike Harris, Section Supervisor

ENGINEERING DATA
OK _____
ECY 040-1-2 (Rev. 8-97)

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PERMIT

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
October 22, 1980	G 2-25737	G 2-25737 P	

NAME
OCEAN PARK WATER COMPANY

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P.O. Box 618 - 263rd "N" Street	Ocean Park	Washington	98640

The applicant is, pursuant to the Report of Examination which has been accepted by the applicant, hereby granted a permit to appropriate the following described public waters of the State of Washington, subject to existing rights and to the limitations and provisions set out herein.

PUBLIC WATER TO BE APPROPRIATED

SOURCE
well (#4)

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	200	252

QUANTITY, TYPE OF USE, PERIOD OF USE
252 acre-feet per year municipal supply continuously

(1500 services)

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL
454 feet East and 265 feet North from center, Section 28.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW¼NE¼	28	12	11 W	24	Pacific

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by Ocean Park Water Company.

DESCRIPTION OF PROPOSED WORKS

Well - 8" x 100'± with a 200,000 gallon reservoir and connected to existing distribution system.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
October 1, 1981	October 1, 1982	October 1, 1983

PROVISIONS

All water wells constructed within the state shall meet the minimum standards for construction and maintenance as provided under RCW 18.104 (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Water Wells.)

Installation and maintenance of an access port as described in Ground Water Bulletin No. 1 is required. An air line and gauge may be installed in addition to the access port.

At such time that the Department of Ecology determines the regulation and management of the subject waters is necessary and in the public interest, an approved measuring device shall be installed and maintained in accordance with RCW 90.03.360 and WAC 508-64-020 through WAC 508-64-040.

A well log of the completed well shall be submitted by the driller to the Department of Ecology within thirty (30) days of completion of this well. This well log shall be complete and all information concerning the static water level in the completed well, in addition to any pump test data, shall be submitted as it is obtained.

In all cases, applicants are urged to locate their wells as far inland as is reasonable because of the uncertainty of the amount of sea-water intrusion that may be experienced in the future.

When the chloride concentration exceed 250 mg/L, the withdrawal rate shall be reduced or the pump setting raised to reduce the chloride level to below 250 mg/L.

Permittee is advised that notice of proof of appropriation of water (under which final certificates of water right issues) should not be filed until the permanent diversion facilities have been installed together with a mainline system capable of delivering the recommended quantity of water to an existing or proposed distribution system within the area to be served.

*Under existing rights there is 448 acre-feet per year as primary right for minicipal supply.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Olympia *Washington, this* 22 *day of* June, *19* 81.

DONALD W. MOOS, Director
Department of Ecology

by E.W. Asselstine
E.W. Asselstine, Regional Manager

ENGINEERING DATA
OK 4-15-81
WES 6-19-81

4.00

60628

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

CERTIFICATE OF WATER RIGHT

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
October 22, 1980	G 2-25737	G 2-25737 P	G 2-25737 C

NAME
OCEAN PARK WATER COMPANY

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P.O. Box 618 - 263rd "N" Street	Ocean Park	Washington	98640

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown.

PUBLIC WATER TO BE APPROPRIATED

SOURCE
well (#4)

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	130	140

QUANTITY, TYPE OF USE, PERIOD OF USE		
140 acre-feet per year	municipal supply	continuously
	(1500 services)	

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL
454 feet East and 265 feet North from center, Section 28.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW¼NE¼	28	12	11 W	24	Pacific

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by Ocean Park Water Company.

FILED
AT THE REQUEST OF: State of Wash
84 MAR 19 A 9:24
ROBERT M. JOHNSON
AUDITOR & RECORDER
COUNTY OF PACIFIC

VOL 8403 462

PROVISIONS

*Under existing rights there is 448 acre-feet per year as primary right for municipal supply.

The access port shall be maintained at all times on the well (s).

At such time that the Department of Ecology determines the regulation and management of the subject waters is necessary and in the public interest, an approved measuring device shall be installed and maintained in accordance with RCW 90.03.360 and WAC 508-64-020 through WAC 508-64-040.

All water wells constructed within the state shall meet the minimum standards for construction and maintenance as provided under RCW 18.104 (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Water Wells.)

In all cases, applicants are urged to locate their wells as far inland as is reasonable because of the uncertainty of the amount of sea-water intrusion that may be experienced in the future.

When the chloride concentration exceeds 250 mg/L, the withdrawal rate shall be reduced or the pump setting raised to reduce the chloride level to below 250 mg/L.

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.020.

This certificate of water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

Given under my hand and the seal of this office at Olympia *Washington, this* 16th *day of* March, *19* 84.

DONALD W. MOOS, Director
Department of Ecology

ENGINEERING DATA
OK

by Norman L. Glenn
Norman L. Glenn, Regional Manager

FOR COUNTY USE ONLY

VOL 8403 463

Ocean Park Water Co
P.O. Box 618
Ocean Park, Wa 98640

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
SUPERCEDING

CERTIFICATE OF WATER RIGHT

☐ Surface Water (issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
March 16, 1987	G2-27073	G2-27073 P	G2-27073 C

NAME
Ocean Park Water Company, Inc.

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
Post Office Box 618	Ocean Park	Washington	98640

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well No. 5

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	105	252

QUANTITY, TYPE OF USE, PERIOD OF USE		
252 acre-feet per year (supplemental)	Municipal supply	Year-round, as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION–WITHDRAWAL
504 feet east and 265 feet north of the center of Section 28.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW¼NE¼	28	11 W	11 W	24	Pacific

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by Ocean Park Water Company Inc.

PROVISIONS

When the chloride concentration exceeds 250 mg/L, the withdrawal rate shall be reduced or the pump setting raised to reduce the chloride level to below 250 mg/L.

Issued as a supplemental source of supply to rights enjoyed under Ground Water Certificates G2-00759 C, G2-21399 C, and G2-25737 C.

The Water Resources Act of 1971 specifies certain criteria regarding utilization and management of the waters of the state in the best public interest. Use of water may be subject to regulation at certain times, based on the necessity to maintain water quantities sufficient for preservation of the natural environment.

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.020.

This certificate of water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

Given under my hand and the seal of this office at Olympia, Washington,

this 2nd *day of* January, *19* 91.

Christine O. Gregoire, Director
Department of Ecology

ENGINEERING DATA
OK GP

by Gail Blanchette

FOR COUNTY USE ONLY

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

CERTIFICATE OF WATER RIGHT

☐ Surface Water (issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
March 16, 1987	G2-27073	G2-27073 P	G2-27073 C

NAME
Ocean Park Water Company, Inc.

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
Post Office Box 618	Ocean Park	Washington	98640

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well No. 5

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	105	252

QUANTITY, TYPE OF USE, PERIOD OF USE		
252 acre-feet per year (supplemental)	Municipal supply	Year-round, as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
504 feet east and 265 feet north of the center of Section 28.

Should be 11 west 1W

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW¼NE¼	28	12	1W	24	Pacific

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by Ocean Park Water Company, Inc.

PROVISIONS

When the chloride concentration exceeds 250 mg/L, the withdrawal rate shall be reduced or the pump setting raised to reduce the chloride level to below 250 mg/L.

Issued as a supplemental source of supply to rights enjoyed under Ground Water Certificates G2-00759 C, G2-21399 C, and G2-25737 C.

The Water Resources Act of 1971 specifies certain criteria regarding utilization and management of the waters of the state in the best public interest. Use of water may be subject to regulation at certain times, based on the necessity to maintain water quantities sufficient for preservation of the natural environment.

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.020.

This certificate of water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

Given under my hand and the seal of this office at Olympia, Washington,

this 14th *day of* November, *19* 90.

Christine O. Gregoire, Director
Department of Ecology

ENGINEERING DATA
OK gb

by Gale Blomquist

FOR COUNTY USE ONLY

No. G2-27073 C

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
March 10, 2000	G2-29907	G2-29907	

NAME
North Beach Water (formerly Ocean Park Water Company, Inc.)

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
25902 Vernon Avenue Suite C	Ocean Park	Washington	98640

The applicant is pursuant to the Report of Examination which has been accepted by the applicant, hereby granted a permit to appropriate the following public waters of the State of Washington, subject to existing rights and to the limitations and provisions set herein.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
North Wellfield – Eight Wells (No's. 1 through 8)
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	65*	80*

QUANTITY, TYPE OF USE, PERIOD OF USE
*Both Qi and Qa are additive quantities to the 4 existing certificates for the North Wellfield, totaling 600 gpm and 515 afy.
80* Acre-feet per year Multiple domestic supply Year-round, as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
Wells 1 and 2 – 830 feet east and 315 feet north of the center of Section 28;
Well 3 – 870 feet east and 335 feet north of the center of Section 28;
Well 4 – 454 feet east and 265 feet north of the center of Section 28;
Well 5 – 504 feet east and 265 feet north of the center of Section 28;
Well 6 – 305 feet east and 325 feet north of the center of Section 28;
Well 7 – 534 feet east and 295 feet north of the center of Section 28; and
Well 8 – 365 feet east and 325 feet north of the center of Section 28.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW1/4 NE1/4	28	12	11W	24	Pacific

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

The place of use (POU) of this water right is the service area described in the most recent Water System Plan/Small Water System Management Program approved by the Washington State Department of Health, so long as *name of water right holder* is and remains in compliance with the criteria in RCW 90.03.386(2). RCW 90.03.386 may have the effect of revising the place of use of this water right.

DESCRIPTION OF PROPOSED WORKS

North Beach Water (formerly Ocean Park Water Company, Inc.) has applied to appropriate groundwater from eight existing wells (Nos. 1 through 8) to use for multiple domestic supply. The eight wells are located on a 4.64 acre parcel termed the North Wellfield. The 6 to 8-inch cased wells were drilled between 1962 and 1996 and completed between 102 and 130 feet below ground surface with 10 to 20 foot well screens. The North Wellfield also contains three 179,000 gallon concrete reservoirs and treatment facilities. Water is pumped from the wells, through dedicated treatment trains and into the storage reservoirs prior to entering the distribution system. The distribution system is pressurized from the North Wellfield by eight booster pumps. The North Beach Water system operates as a Group A public water system (PWS) and is identified by the Washington State Department of Health (DOH) by PWS ID 63000C. North Beach Water currently services 2,644 connections.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	Completed	July 1, 2026

PROVISIONS

The applicant is advised that the quantity of water allocated by this permit may be reduced at the time of final certification to reflect system capacity and actual usage.

A certificate of water right will not be issued until a final investigation is made.

An approved measuring device shall be installed and maintained for each diversion/withdrawal of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use," Chapter 173-173 WAC.

Water use data shall be recorded weekly. The maximum monthly rate of diversion/withdrawal and the monthly total volume shall be submitted to Ecology by January 31st of each calendar year. Ecology is requiring submittal of monthly meter readings to collect seasonal information for water resource planning, management and compliance.

Reported water use data shall be submitted via the Internet or by using the enclosed forms. To set up an internet account, access Https://fortress.wa.gov/ecy/wrx/Meteringx/. If you have questions or need additional forms, contact the Southwest Regional office.

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

WAC 173-173 describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition the Department of Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document titled "Water Measurement Device Installation and Operation Requirements". http://www.ecy.wa.gov/programs/wr/measuring/measuringhome.html

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Olympia, Washington,

this 11th *day of* December, *2008.*

Department of Ecology

OK PC

by Thomas Loranger

Thomas Loranger, Section Manager

Karl Johnson

From: Clark, Susan (ECY) [sucl461@ECY.WA.GOV]
Sent: Wednesday, June 11, 2014 11:49 AM
To: kjohnson@g-o.com
Subject: Water right question
Attachments: NorthBeach2007ReviewLetter.pdf

Karl: I have completed my review of the water rights for the North Beach Water District, paying particular attention to G2-29907. As detailed in the attached letter provided to the North Beach Water District Ecology confirmed in 2007 that the system's North Wellfield water rights totaled 535 gpm (Qi) and 448 acre-feet (Qa), excluding G2-29907. In December 2008 Ecology authorized an additional 65 gpm (Qi) and 80 acre-feet (Qa) via Permit G2-29907 as noted in both the recommendation on page 7 of the ROE and in the "public waters to be appropriated" chart on the Permit cover page. Because the ROE does not provide an explanation of the reduced Qa contained in the footnote (515 acre-feet) and both the recommendation and "public waters to be appropriated" chart acknowledge the authorization of 80 acre-feet (Qa), Ecology is in agreement that with the addition of the 80 acre-feet authorized by Permit G2-29907, the total annual authorization for the North Wellfield is indeed 528 acre feet/year. For future reference, I will add this correspondence to file G2-29907.

Should you have any questions, feel free to contact me.

Thank you. Susan

Susan Clark, Permit-Writer
Department of Ecology, Southwest Regional Office
360 407 7667

From: Karl Johnson [mailto:kjohnson@g-o.com]
Sent: Thursday, June 05, 2014 1:43 PM
To: Mike Gallagher
Subject: Water right question

Mike:

I am working on a water system plan for North Beach Water District in Ocean Park Washington. I am going through water rights and trying to make sense of the latest right, G2-29907P. On the permit it states that the annual quantity is 80 ac-ft/yr and that this amount is additive to the other four pre-existing rights for the north wellfield (G2-00759C, G2-21399C, G2-25737C, and G2-27073C). Right G2-27073C states that it is supplemental to rights G2-00759C, G2-21399C and G2-25737C. Right G2-25737C states that it is supplemental to rights G2-00759C, G2-21399C. Right G2-21399C is partially supplemental to right G2-00759C, with a total annual right of 448 ac-ft/yr between the two rights, making it 128 ac-ft/yr primary and 32 ac-ft/yr supplemental. So it looks on the surface like the total annual rights should be 448 + 80 = 528 ac-ft/yr. And in fact in the ROE for permit G2-29907P in the table on Page 3 a total of 448 ac-ft/yr preexisting rights is indicated for the north wellfield, and in the Recommendation on page 7 of the ROE it is recommended that the requested 80 ac-ft/yr annual right, as well as the requested 65 gpm instantaneous right, be issued, and it states that the total annual right for the north wellfield would then be 528 ac-ft/yr, same as I figure. The permit was in fact issued for 65 gpm and 80 ac-ft/yr, and does state that this is entirely additive to existing rights, but then it states that the total of rights for the north wellfield is 515 ac-ft/yr. I do not see anything that would limit the total of rights to 515 ac-ft/yr. Why isn't this 528 ac-ft/yr?

It would be most helpful if you could clarify this for me.

Thanks.

Karl Johnson, P.E.
Gray & Osborne, Inc., Olympia
2102 Carriage Drive SW, Building I
Olympia, WA 98502
Phone: (360) 292-7481 Ext 1506
Fax: (360) 292-7517
kjohnson@g-o.com

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

January 14, 2007

RD Williams
North Beach Water
P O Box 618
Ocean Park WA 98640

Karen Klocke
Department of Health
Southwest Drinking Water Operations
PO Box 47823
Olympia, WA 98504-7823

Re: North Beach Water System Plan, ID #63000, Pacific County, ODW Project 07-1202

Thank you for the opportunity to review the Water System Plan (WSP) for the North Beach Water System. Consistent with the Memorandum of Understanding between the Department of Health and Ecology, I reviewed the relevant portions of the WSP and offer the following comments.

Water Rights Analysis

The Water Rights analysis in the WSP appears to coincide with Ecology's records. The system holds a total of five water right certificates. The WSP divides the wells between the North and South Wellfields.

The North Wellfield holds four water right certificates:

- G2-00759 (Wells 1,2,7,&8) for 200 gpm and 320 afy, additive
- G2-21399 (Wells 3,6) for 100 gpm and 160 afy, partially additive. Total between the two cannot exceed 448 afy.
- G2-25737 (Well 4) for 130 gpm and 140 afy (non-additive)
- G2-27073 (Well 5) for 105 gpm and 252 afy (non-additive)

The total instantaneous and annual quantities for these wells are 535 gpm and 448 afy.

The South Wellfield holds one water right certificate:

- G2-00174 (Wells 1,2,4) for 500 gpm and 168 afy (additive)

The whole system holds an instantaneous and annual quantity of 1035 gpm and 616 afy.

Application G2-29907 was submitted to Ecology in March 2000 for additional instantaneous and annual quantities. To date, Ecology has not acted on the application.

Future Demand

The Water Demand Projections (Exhibit 2-3) shows the system holds adequate water rights through 2018, but will exceed their water rights by 2026.

Instantaneous Capacities

It appears that the pumping capacities in some wells in the North Wellfield exceed the instantaneous allocations of their individual water rights. Exhibit 3-6 (Page 68) shows Wells 1, 2,7, & 8 have a total capacity of 420.5 gpm. The water right for these wells allows 200 gpm. In addition, Wells 3 & 6 have the capacity to pump 217 gpm. The water right for these wells allows 100 gpm.

Though the system may not be exceeding total instantaneous capacity of all the wells, some individual wells may be exceeding their water rights.

- **Action**: The final WSP should clarify how the system is operating the wells to stay within the authorized rights.

"Not Inconsistent" Determination with Watershed Plan

A "not inconsistent" determination is not required because there is not an approved/adopted watershed plan for WRIA 24.

Thank you for the opportunity to review this WSP. Please contact me at (360) 407-0290 if you have questions regarding my review or need additional information.

Sincerely,

Deb Hunemuller
Water Resources Program

DH:th

cc: Teresa Walker, DOH
Tom Frare, P.E., TJF & Associates

APPENDIX C

WELL CONSTRUCTION RECORDS AND SUSCEPTIBILITY ASSESSMENTS

ATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
DIVISION OF WATER RESOURCES

WELL SCHEDULE No. 12/1W1-28G

Date 4-17, 1974

Record by P. GRIMSTAD

Source

1. **Location:** State of WASHINGTON
   County PACIFIC
   Area NAHCOTTA
   Map OCEAN PARK QUAD
   SW¼ NE¼ sec. 28 T. 12 N., R. 11 W.
   Details 1501 S. DE VAIO RD. — 0.35 MILE
   W. OF [illegible] TAKE SECTION — PENINSULA LANE
   & VAIO RD.

DIAGRAM OF SECTION

2. **Owner or Tenant** OCEAN PARK (His No.)
   Address (MR. LYLE CLARK, SUP.)
3. **Driller:** Address
4. **Land-surface datum:** ft. above / below
   Topography:
5. **Type:** Dug (Drilled) Driven **Depth:** Rept. 200± feet
   Bored Jetted Meas. feet
   Date , 19
6. **Casing:** Diam. 6" to in. / ft. Type
   Depth ft. Finish
7. **Chief aquifer(s):** from ft. to ft.
8. **Water level:** Rept. Meas. 3.86 ft. 4/17, 1974, above / below TOP CAP
   PUMP WAS NOT USED IN 1971 which is 1± ft. above / below datum
9. **Pump:** Type NONE Capacity / Size gal. min.
   Driven by horsepower
10. **Yield:** Flow gal. min. Pump gal. min. Meas. Rept. Est.
    Drawdown ft. after hours pumping gal. min.
    Adequacy, permanence
11. **Use:** Dom. Stock. PS. Ind. Irr. Obs.
12. **Quality:** Sample No. , 19 Temp. °F.
    Taste, color, hardness, sanitation, etc.
13. **Other data:** Log Water levels Draft Pump test Analyses

Turn up

Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

Application No. .....

Permit No. .....

(1) OWNER: Name Lyle Crath NBWN-SQ3 Address .....

(2) LOCATION OF WELL: County ..... — ..... ¼ ..... ¼ Sec. ..... T. ..... N., R. ..... W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☑
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) ..... #3
New well ☑ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☑ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well ..... inches.
Drilled ..... ft. Depth of completed well ..... ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 124 " Diam. from 1 ft. to 124 ft.
Threaded ☐ ..... " Diam. from ..... ft. to ..... ft.
Welded ☐ ..... " Diam. from ..... ft. to ..... ft.

Perforations: Yes ☐ No ☑
Type of perforator used .....
SIZE of perforations ..... in. by ..... in.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

Screens: Yes ☑ No ☐ Johnson Div
Manufacturer's Name .....
Type ..... Model No. .....
Diam. 5 Slot size 80 from 114 ft. to 124 ft.
Diam. ..... Slot size ..... from ..... ft. to ..... ft.

Gravel packed: Yes ☐ No ☑ Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

Surface seal: Yes ☐ No ☑ To what depth? ..... ft.
Material used in seal .....
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? ..... Depth of strata .....
Method of sealing strata off .....

(7) PUMP: Manufacturer's Name .....
Type: ..... H.P. .....

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 4 ft. below top of well Date .....
Artesian pressure ..... lbs. per square inch Date .....
Artesian water is controlled by ..... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☑ No ☐ If yes, by whom? .....
Yield: ..... gal./min. with ..... ft. drawdown after ..... hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test .....
Bailer test 50 gal./min. with 20 ft. drawdown after 24 hrs.
Artesian flow ..... g.p.m. Date .....
Temperature of water ..... Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Brown SAND	1	28
Blue Brown SAND	28	124

Work started ..... 19..... Completed ..... 19.....

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Smith Drilling Co
(Person, firm, or corporation) (Type or print)

Address Box 32 Star Rt. Colville

[Signed] .....
(Well Driller)

License No. ..... Date ....., 19.....

S. F. No. 7356—OS—(Rev. 4-71).

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. G2-25737

(1) OWNER: Name Ocean Park Water Co. Address Ocean Park

(2) LOCATION OF WELL: County Pacific NW ¼ SE ¼ Sec. 28 T. 12 N., R. 11 W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) ....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 120 ft. Depth of completed well 120 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 8 " Diam. from 0 ft. to 100 ft.
Threaded ☐ ..... " Diam. from ..... ft. to ..... ft.
Welded ☐ ..... " Diam. from ..... ft. to ..... ft.

Perforations: Yes ☐ No ☒
Type of perforator used .....
SIZE of perforations ..... in. by ..... in.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

Screens: Yes ☒ No ☐
Manufacturer's Name Johnson
Type Telescope Model No. .....
Diam. 8 Slot size 18 from 100 ft. to 120 ft.
Diam. ..... Slot size ..... from ..... ft. to ..... ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? ..... Depth of strata .....
Method of sealing strata off .....

(7) PUMP: Manufacturer's Name .....
Type: ..... H.P. .....

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 14 ft. below top of well Date .....
Artesian pressure ..... lbs. per square inch Date .....
Artesian water is controlled by ..... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom? .....
Yield: ..... gal./min. with ..... ft. drawdown after ..... hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test .....
Bailer test 50 gal./min. with 6 ft. drawdown after 1 hrs.
Artesian flow ..... g.p.m. Date .....
Temperature of water ..... Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:
Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Brown Sand	0	62
Grey Sand	62	120

RECEIVED
JUN 2 - 1981
DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE

Work started April 21, 19 81 Completed April 25, 19 81

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Smith Drilling Inc. (Person, firm, or corporation) (Type or print)
Address St. Rt. Bx. 32 Cosmopolis
[Signed] Randy Smith (Well Driller)
License No. 0479 Date April 25, 19 81

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. .....

Permit No. G-22023

(1) OWNER: Name Ocean Park Water Address Ocean Park Wash

(2) LOCATION OF WELL: County Pacific County NW ¼ SE ¼ Sec. 28 T. 12 N., R. 11W W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☒ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) .... #5
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 125 ft. Depth of completed well 124 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 8 " Diam. from +2 ft. to 104 ft.
Threaded ☐ ____ " Diam. from ____ ft. to ____ ft.
Welded ☐ ____ " Diam. from ____ ft. to ____ ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations ____ in. by ____ in.
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type ____ Model No.
Diam. ____ Slot size ____ from ____ ft. to ____ ft.
Diam. ____ Slot size ____ from ____ ft. to ____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ____ ft. to ____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? ____ Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: ____ H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level....
Static level 12 ft. below top of well Date July 86
Artesian pressure ____ lbs. per square inch Date
Artesian water is controlled by ____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom?
Yield: ____ gal./min. with ____ ft. drawdown after ____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 56 gal./min. with 10 ft. drawdown after 1 hrs.
Artesian flow ____ g.p.m. Date
Temperature of water ____ Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Top Soil Dark Brown	0	3
Sand Brown	3	47
Fine Sand	47	90
Sand-Blue Clay	90	104

Work started July, 19 86 Completed July, 19 86

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Pete Smith Well Drilling
(Person, firm, or corporation) (Type or print)

Address R 1 Box 266 Hoodsport Wash

[Signed] Jack A. Hall
(Well Driller)

License No. 0195 Date July, 19 86

(USE ADDITIONAL SHEETS IF NECESSARY)

S. F. No. 7356—OS—(Rev. 4-71).

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W 16437
UNIQUE WELL I.D. # 228
Water Right Permit No. _____

(1) **OWNER:** Name Ocean Park Water Address PO Box 618 Ocean Park WA 98640

(2) **LOCATION OF WELL:** County Pacific - NE 1/4 NE 1/4 Sec 6 T. 12 N., R. 11 W W.M.

(2a) **STREET ADDRESS OF WELL** (or nearest address) _____

(3) **PROPOSED USE:** ☐ Domestic ☐ Industrial ☐ Municipal ☒ ☐ Irrigation ☐ Test Well ☐ Other ☐ ☐ DeWater

(4) **TYPE OF WORK:** Owner's number of well (if more than one) #1
Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐ Deepened ☐ Cable ☒ Driven ☐ Reconditioned ☐ Rotary ☐ Jetted ☐

(5) **DIMENSIONS:** Diameter of well 8" inches.
Drilled 130 feet. Depth of completed well 130 ft.

(6) **CONSTRUCTION DETAILS:**
Casing installed: 8" Diam. from +2 ft. to 107 ft.
Welded ☐ _____" Diam. from _____ ft. to _____ ft.
Liner installed ☐ _____" Diam. from _____ ft. to _____ ft.
Threaded ☐

Perforations: Yes ☐ No ☐
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☒ No ☐
Manufacturer's Name Johnson
Type _____ Model No. _____
Diam. 2" Slot size 10 from 107 ft. to 117 ft.
Diam. 1" Slot size 8 from 127 ft. to 117 ft.

Gravel packed: Yes ☐ No ☐ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 20' ft.
Material used in seal Bentonite Chips
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) **PUMP:** Manufacturer's Name _____
Type: _____ H.P. _____

(8) **WATER LEVELS:** Land-surface elevation above mean sea level _____ ft.
Static level 8' ft. below top of well Date 3-4-96
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) **WELL TESTS:** Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test 45 gal./min. with 2' ft. drawdown after 1 hrs.
Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) **WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION**

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Brown Sand	0	56
Gray Sand & wood	56	130

Work Started 2-28, 19 96 Completed 3-4, 19 96

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Hoyt Drilling Inc (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address 10621 Todd Rd E Puyallup WA 98372
(Signed) Wade Hoyt (WELL DRILLER) License No. 597
Contractor's Registration No. HOYTDI*13606 Date 5-2, 19 96

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

ECY 050-1-20 (9/93) * * I

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W10362
UNIQUE WELL I.D. # 229
Water Right Permit No. _____

(1) OWNER: Name Ocean Park Water Address PO Box 618 Ocean Park WA 98640

(2) LOCATION OF WELL: County Pacific - NE 1/4 NE 1/4 Sec 6 T. 12 N., R. 11 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) off 178th

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☒ ☐ Irrigation ☐ Test Well ☐ Other ☐ ☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) # 2
Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐ Deepened ☐ Cable ☒ Driven ☐ Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches. Drilled 130 feet. Depth of completed well 130 ft.

(6) CONSTRUCTION DETAILS:
Casing Installed: 8 " Diam. from +4 ft. to 106 ft.
Welded ☐ Liner installed ☐ Threaded ☐ _____ " Diam. from _____ ft. to _____ ft.
_____ " Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☐
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☒ No ☐
Manufacturer's Name Johnson
Type _____ Model No. _____
Diam. 7" Slot size 8 from 106 ft. to 116 ft.
Diam. 7" Slot size 10 from 126 ft. to 116 ft.

Gravel packed: Yes ☐ No ☐ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal Bentonite Chip
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 5' ft. below top of well Date 3-6-96
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test 40 gal./min. with 8' ft. drawdown after 1 hrs.
Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Brown Sand	0	80
Gray Fine Sand	80	130

Work Started 3-5 19 96 Completed 3-6 19 96

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Holt Drilling Inc. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address 0621 Todd Rd E Puyallup WA 98372
(Signed) Wade Iverson (WELL DRILLER) License No. 597
Contractor's Registration No. HOLTDI*136O6 Date 5-2 19 96

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

ECY 050-1-20 (9/93) * * I

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W 16361
UNIQUE WELL I.D. # 230
Water Right Permit No. _____

(1) **OWNER:** Name Pacific Water Co. Address PO Box 982

(2) **LOCATION OF WELL:** County Pacific - NE 1/4 NW 1/4 Sec 6 T. 12 N., R. 11 W W.M.

(2a) **STREET ADDRESS OF WELL** (or nearest address) off 130th

(3) **PROPOSED USE:** ☐ Domestic ☐ Industrial ☐ Municipal ☒ ☐ Irrigation ☐ Test Well ☐ Other ☐ ☐ DeWater

(4) **TYPE OF WORK:** Owner's number of well (if more than one) #2

Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐ Deepened ☐ Cable ☒ Driven ☐ Reconditioned ☐ Rotary ☐ Jetted ☐

(5) **DIMENSIONS:** Diameter of well 8 inches. Drilled 121 feet. Depth of completed well 121 ft.

(6) **CONSTRUCTION DETAILS:**

Casing Installed: 8" Diam. from +2 ft. to 101 ft.
Welded ☒ Liner installed ☐ Threaded ☐ _____" Diam. from _____ ft. to _____ ft.
_____" Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☐
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☒ No ☐
Manufacturer's Name Johnson
Type _____ Model No. _____
Diam. 7" Slot size 8 from 121 ft. to 101 ft.
Diam. 7" Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☐ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal Bentonite Chip
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) **PUMP:** Manufacturer's Name _____
Type: _____ H.P. _____

(8) **WATER LEVELS:** Land-surface elevation above mean sea level _____ ft.
Static level 8' ft. below top of well Date 3-11-96
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) **WELL TESTS:** Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test 55 gal./min. with 4 ft. drawdown after 1 hrs.
Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) **WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION**

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Brown Sand	0	55
Gray Sand	55	121

Work Started 3-5 19 96 Completed 3-11 19 96

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Holt Drilling Inc (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 10621 Todd Rd E Puyallup WA 98372

(Signed) Wade Jensen (WELL DRILLER) License No. 597

Contractor's Registration No. Holt DI*13606 Date 5-2 19 96

(USE ADDITIONAL SHEETS IF NECESSARY)

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ECY 050-1-20 (9/93) * * I

Data entered 5/16/01 - DG

WDRA 2t 525

Ground Water Contamination Susceptibility Assessment Survey Form

Version 2.2

IMPORTANT! Please complete one form for each ground water source (well, wellfield, spring) used in your water system. Photocopy as necessary.

PART I: System Information

Well owner/manager : Phillip C. Leach

Water system name : Pacific Water Company Inc

County: Pacific

Water system number: 20051V Source number: SO-4-#4

Well depth: 121-ft (ft.) (*From WFI form*)

Source name: SO-1 (Old Farm)Well Field

WA well identification tag number: A B Y-2 3 0

_____ well not tagged

Number of connections: 300 Population served: _____

Township: 12N Range: 11W

Section: 33 1/4 1/4 Section: SW 1/4 of NE 1/4

Latitude/longitude (if available): N 46 29 194 / W 124 02 239

How was lat./long. determined?

XXX global positioning device ____ survey ____ topographic map
____ other: _____

* Please refer to Assistance Packet for details and explanations of all questions in Parts II through V.

PART II: Well Construction and Source Information

1) Date well originally constructed: 03/ 05 /96 month/day/year

last reconstruction: ___ / ___ /___ month/day/year

_____ information unavailable

2) Well driller: Holt Drilling Inc.

10621 Todd Rd E.

Puyallup, WA 98372

___ well driller unknown

3) Type of well:

__Drilled: ___ rotary ___ bored XX cable (percussion) ___ **Dug**

___ **Other:** ___ spring(s) ___ lateral collector (Ranney)

___ driven ___ jetted ___ other: _____

Additional comments: _____

_____

4) Well report available? XXX YES (attach copy to form) ___ NO

If no well log is available, please attach any other records documenting well construction; e.g. boring logs, "as built" sheets, engineering reports, well reconstruction logs.

5) Average pumping rate: 120 (gallons/min)

Source of information: Pump test data 4-10-96

If not documented, how was pumping rate determined? _____

_____

___ Pumping rate unknown

6) Is this source treated? XXX YES ___ NO

If so, what type of treatment:

___ disinfection XXX filtration ___ carbon filter XXX air stripper XX other

Purpose of treatment (describe materials to be removed or controlled by treatment):

Remove, color, H2S, irom & mang

This new well is not on line yet, the water will be blended with better water I hope.

7) If source is chlorinated, is a chlorine residual maintained: XX YES ___ NO

Residual level: 0.5 PPM (*At the point closest to the source.*)

PART III: Hydrogeologic Information

1) Depth to top of open interval: [check one]

___ (less than) 20 ft ___ 20–50 ft ___ 50–100 ft xx 100–200 ft ___ (greater than) 200 ft

___ information unavailable

2) Depth to ground water (static water level):

xxx (less than) 20 ft ___ 20–50 ft ___ 50–100 ft ___ (greater than) 100 ft

___ flowing well/spring (artesian)

How was water level determined?

xx well log ___ other: _____

___ depth to ground water unknown

3) ~~If source~~ is a flowing well or spring, what is the confining pressure:

_____ psi (pounds per square inch)
or
_____ feet above wellhead

4) If source is a flowing well or spring, is there a surface impoundment, reservoir, or catchment associated with this source: ___ YES ___ NO

5) Wellhead elevation (height above mean sea level): _____ (ft)

How was elevation determined? ___ topographic map ___ Drilling/Well Log ___ altimeter

___ other: _____

xxx information unavailable

6) Confining layers: (This can be completed only for those sources with a drilling log, well log or geologic report describing subsurface conditions. Please refer to assistance package for example.)

___ evidence of a confining layer in well log

xxx no evidence of a confining layer in well log

If there is evidence of a confining layer, is the depth to ground water more than 20 feet above the **bottom** of the **lowest confining layer?** ___ YES ___ NO

___ information unavailable

7) Sanitary setback:

___ (less than) 100 ft* ___ 100–120 ft XX 120–200 ft ___ (greater than) 200 ft
* if less than 100 ft describe the site conditions:

_____

_____

_____

_____

8) Wellhead construction:

XX wellhead enclosed in a wellhouse

___ controlled access (describe): _____

Not Constructed yet.

___ other uses for wellhouse (describe): _____

_____

___ no wellhead control

9) Surface seal:

___ 18 ft

___ (less than) 18 ft (no Department of Ecology approval)

___ (less than) 18 ft (Approved by Ecology, include documentation)

XXX (greater than) 18 ft

___ depth of seal unknown

___ no surface seal

10) Annual rainfall (inches per year):

___ (less than) 10 in/yr ___ 10–25 in/yr XXX (greater than) 25 in/yr

PART IV: Mapping Your Ground Water Resource

1) Annual volume of water pumped: 34,000,000 (gallons)

How was this determined?

XXXmeter

___ estimated: ___ pumping rate (65 gpm)

___ pump capacity (80 gpm)

___ other: _____

2) "Calculated Fixed Radius" estimate of ground water movement:
(see Instruction Packet)

6 month ground water travel time : 440 (ft)

1 year ground water travel time : 620 (ft)

5 year ground water travel time: 1390 (ft)

10 year ground water travel time: 1970 (ft)

Information available on length of screened/open interval?

XXXYES ___ NO

Length of screened/open interval: 20 (ft)

3) Is there a river, lake, pond, stream, or other obvious surface water body within the 6 month time of travel boundary? XX YES ___ NO (mark and identify on map).

4) Is there a stormwater and/or wastewater facility, treatment lagoon, or holding pond located within the 6 month time of travel boundary? ___ YES XXXNO (mark and identify on map).

Comments: _____

_____

_____

_____

_____

PART V: Assessment of Water Quality

1) Regional sources of risk to ground water:

Please indicate if any of the following are present within a circular area around your water source having a radius up to and including the five year ground water travel time:

	6 month	1 year	5 year	unknown
likely pesticide application	____	____	____	____
stormwater injection wells	____	____	____	____
other injection wells	____	____	____	____
abandoned ground water well	____	____	____	____
landfills, dumps, disposal areas	____	____	____	____
known hazardous materials clean-up site	____	____	____	____
water system(s) with known quality problems	____	____	____	____
population density (greater than) 1 house/acre	____	____	____	____
residences commonly have septic tanks	____	____	____	____
Wastewater treatment lagoons	____	____	____	____
sites used for land application of waste	____	____	____	____

Mark and identify on map any of the risks listed above which are located within the 6 month time of travel boundary? (*Please include a map of the wellhead and time of travel areas with this form. Please locate and mark any of the following.*)

If other recorded or potential sources of ground water contamination exist within the ten year time of travel circular zone around your water supply, please describe:

_____

_____

_____

_____

_____

_____

2) Source specific water quality records:

Please indicate the occurrence of any test results since 1986 that meet the following conditions: (Unless listed on assessment, MCLs are listed in assistance package.)

	YES
A. Nitrate: (Nitrate MCL = 10 mg/l)	
Results greater than MCL	____
(less than) 2 mg/liter nitrate	XXX
2–5 mg/liter nitrate	____
(greater than) 5 mg/liter nitrate	____
Nitrate sampling records unavailable	____
B. VOCs: (VOC detection level 0.5 ug/l or 0.0005 mg/l.)	YES
Results greater than MCL or SAL	____
VOCs detected at least once	____
VOC test performed but never detected	____
VOC sampling records unavailable	XXX
C. EDB/DBCP:	YES
(EDB MCL = 0.05 ug/l or 0.00005 mg/l. DBCP MCL = 0.2 ug/l or 0.0002 mg/l.)	
EDB/DBCP detected below MCL at least once	____
EDB/DBCP detected above MCL at least once	____
EDB/DBCP never detected	____
EDB/DBCP tests required but not yet completed	____
EDB/DBCP tests not required	XX
D. Other SOCs (pesticides and other synthetic organic chemicals):	YES
Other SOCs detected	____
Other SOC tests performed but none detected *	____
Other SOC tests not performed	____

*If any SOCs in addition to EDB/DBCP were detected, please identify and date. If other SOC tests were performed, but no SOCs detected, list test methods here: _____

_____

_____

_____

E. Bacterial contamination: YES

Any bacterial detection(s) in the past 3 years in samples taken from the source (not distribution sampling records). ____

Has source (in past 3 years) had a bacteriological contamination problem found in distribution samples that was attributed to the source. ____

Source sampling records for bacteria unavailable ____

Part VI: Geographic or Hydrologic Factors Contributing to a Non-Circular Zone of Contribution

The following questions will help identify those ground water systems which may not be accurately represented by the calculated fixed radius (CFR) method described in Part IV. For these sources, the CFR areas should be used as a preliminary delineation of the critical time of travel zones for that source. As a system develops its Wellhead Protection Plan for theses sources, a more detailed delineation method should be considered.

1)Is there evidence of obvious hydrologic boundaries within the 10 year time of travel zone of the CFR? (Does the largest circle extend over a stream, river, lake, up a steep hillside, and/or over a mountain or ridge?)

XXX YES ___ NO

Describe with references to map produced in Part IV:

SO-4 10-year time travel touches the East tip of the Willapabay and crosses the drainage outfall from Rushlight Lake to the Willapabay, and Back-Wash Pond and swamp to the west.

2) Aquifer Material:

A) Does the drilling log, well log or other geologic/engineering reports identify that the well is located in an area where the underground conditions are identified as fractured rock and/or basalt terrain?

___ YES XXX NO

B) Does the drilling log, well log or other geologic/engineering reports indicate that the well is located in an area where the underground conditions are primarily identified as coarse sand and gravel?

___ YES XXX NO

3) Is the source located in an aquifer with a high horizontal flow rate? (These can include sources located on flood plains of large rivers, artesian wells with high water pressure, and/or shallow flowing wells and springs.)

___ YES XXX NO

4) Are there other high capacity wells (agricultural, municipal and/or industrial) located within the CFRs?

a) Presence of ground water extraction wells removing more than approximately 500 gal/min within...

	YES	NO	unknown
6 month travel time	___	XX	___
6 month–1 year travel time	___	XX	___
1–5 year travel time	___	XX	___
5–10 year travel time	___	XX	___

b) Presence of ground water recharge wells (dry wells) or heavy irrigation within...

	YES	NO	unknown
1 year travel time	___	XX	___
1–5 year travel time	___	XX	___
5–10 year travel time	___	XX	___

Please identify or describe additional hydrologic or geographic conditions that you believe may affect the shape of the zone of contribution for this source. Where possible, reference them to locations on the map produced in Part IV.

Suggestions and Comments

Did you attend one of the susceptibility workshops?	___ YES	___ NO
Did you find it useful?	___ YES	___ NO
Did you seek outside assistance to complete the assessment?	___ YES	___ NO

This form and instruction packet are still in the process of development. Your comments, suggestions and questions will help us upgrade and improve this assessment form. If you found particular sections confusing or problematic please let us know. How could this susceptibility assessment be improved or made clearer? Did the instruction package help you find the information needed to complete the assessment? How much time did it take you to complete the form? Were you able to complete the assessment without additional/outside expertise? Do you feel the assessment was valuable as a learning experience? Any other comments or constructive criticisms you have would be appreciated.

EDGE Analytical, Inc.
1151 Knudson Rd.
Burlington, WA 98233
(360) 757-1400 - FAX (360) 757-1402

INORGANIC COMPOUNDS (IOC) REPORT

Client Name: Pacific Water Company
Box 982
Long Beach, WA 98631

Reference Number: 96-0822
Project: New Well

System Name: PACIFIC WATER COMPANY INC.
System ID Number: 20051V
DOH Source Number: 04
Multiple Sources:
Sample Type:
Sample Purpose:
Sample Location: new pump S04
County: Pacific

Sample Number: water
Lab Number: 0461278
Supervisor:
Review: 4/30/96
Collect Date: 4/ 9/96
Report Date: 4/30/96

EPA CODE	DOH #	COMPOUNDS	AMOUNT mg/L*	MCL mg/L**	SRL mg/L***	Lab MDL****	COMMENT
		EPA Primary					
1005	4	ARSENIC	0.015	0.05	0.01	0.005	
1010	5	BARIUM	ND	2	0.1	0.010	
1015	6	CADMIUM	ND	0.005	0.01	0.001	
1020	7	CHROMIUM	ND	0.1	0.04	0.001	
1030	9	LEAD	ND	0.015	0.002	0.001	
1035	11	MERCURY	ND	0.002	0.0005	0.0005	
1045	12	SELENIUM	ND	0.05	0.005	0.005	
1050	13	SILVER	ND	0.05	0.01	0.001	
1052	14	SODIUM	19.2		1	1.0	
100	17	TURBIDITY	0.28	1	0.1	0.1	
1025	19	FLUORIDE	ND	4	0.5	0.1	
1040	20	NITRATE-N	ND	10	0.5	0.1	
1022	23	COPPER	ND	1.3	0.02	0.01	
1095	24	ZINC	ND	5	0.02	0.005	
1075	110	BERYLLIUM	ND	0.004	0.002	0.001	
1036	111	NICKEL	ND	0.1	0.1	0.001	
74	112	ANTIMONY	ND	0.006	0.05	0.001	
1085	113	THALLIUM	ND	0.002	0.002	0.001	
1041	114	NITRITE-N	ND	10	0.5	0.1	
1024	116	CYANIDE	ND	0.2	0.1	0.01	
		EPA Secondary					
1028	8	IRON	4.51	0.3	0.05	0.050	
1032	10	MANGANESE	0.58	0.05	0.01	0.001	
1915	15	HARDNESS	74.8		10	10	
1064	16	ELECTRICAL CONDUCTIVITY	268	700	10	10	
1905	18	COLOR	>50	15	5	5	
1017	21	CHLORIDE	32.47	250	20	1	
1055	22	SULFATE	ND	250	10	2	
1057	26	TOTAL DISSOLVED SOLIDS	210	500	150	10	

*. An amount of "ND" indicates that the compound was not detected above the Specified Reporting Limit (SRL).
**. Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. A Blank value indicates that an MCL has not been established for that analyte.
*** SRL = Specified Reporting Limit (WSDOH required detection limit). A value of one-half the SRL may result in increased monitoring.
****. Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Start Card No. W16361
UNIQUE WELL I.D. # 270
Water Right Permit No. _____

) OWNER: Name Pacific Water Co. Address PO Box 982

(2) LOCATION OF WELL: County _____ NE 1/4 NW 1/4 Sec 6 T. 12 N., R. 01 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 046 150th

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☒ ☐ Irrigation ☐ Test Well ☐ Other ☐ ☐ DeWater

(4) TYPE OF WORK: Owner's number of well (If more than one) #2
Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐ Deepened ☐ Cable ☒ Driven ☐ Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches. Drilled 121 feet. Depth of completed well 121 ft.

(6) CONSTRUCTION DETAILS:
Casing Installed: 8" Diam. from +2 ft. to 101 ft.
Welded ☒ Liner Installed ☐ Threaded ☐ _____" Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☐
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☒ No ☐
Manufacturer's Name Johnson
Type _____ Model No. _____
Diam. 7" Slot size 8 from 121 ft. to 101 ft.
Diam. 7" Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☐ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal Bentonite Chips
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 8 ft. below top of well Date 3-11-96
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

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Bailer test 55 gal./min. with 4 ft. drawdown after 1 hrs.
Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Brown Sand	0	55
Gray Sand	55	121

Work Started 3-5 19 96 Completed _____ 19 ____

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Holt Drilling Inc (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 10621 Todd Rd E Puyallup WA 98373

(Signed) Wade Jensen (WELL DRILLER) License No. 597

Contractor's Registration No. Holt DIR 17606 Date 5-2 19 96

(USE ADDITIONAL SHEETS IF NECESSARY)

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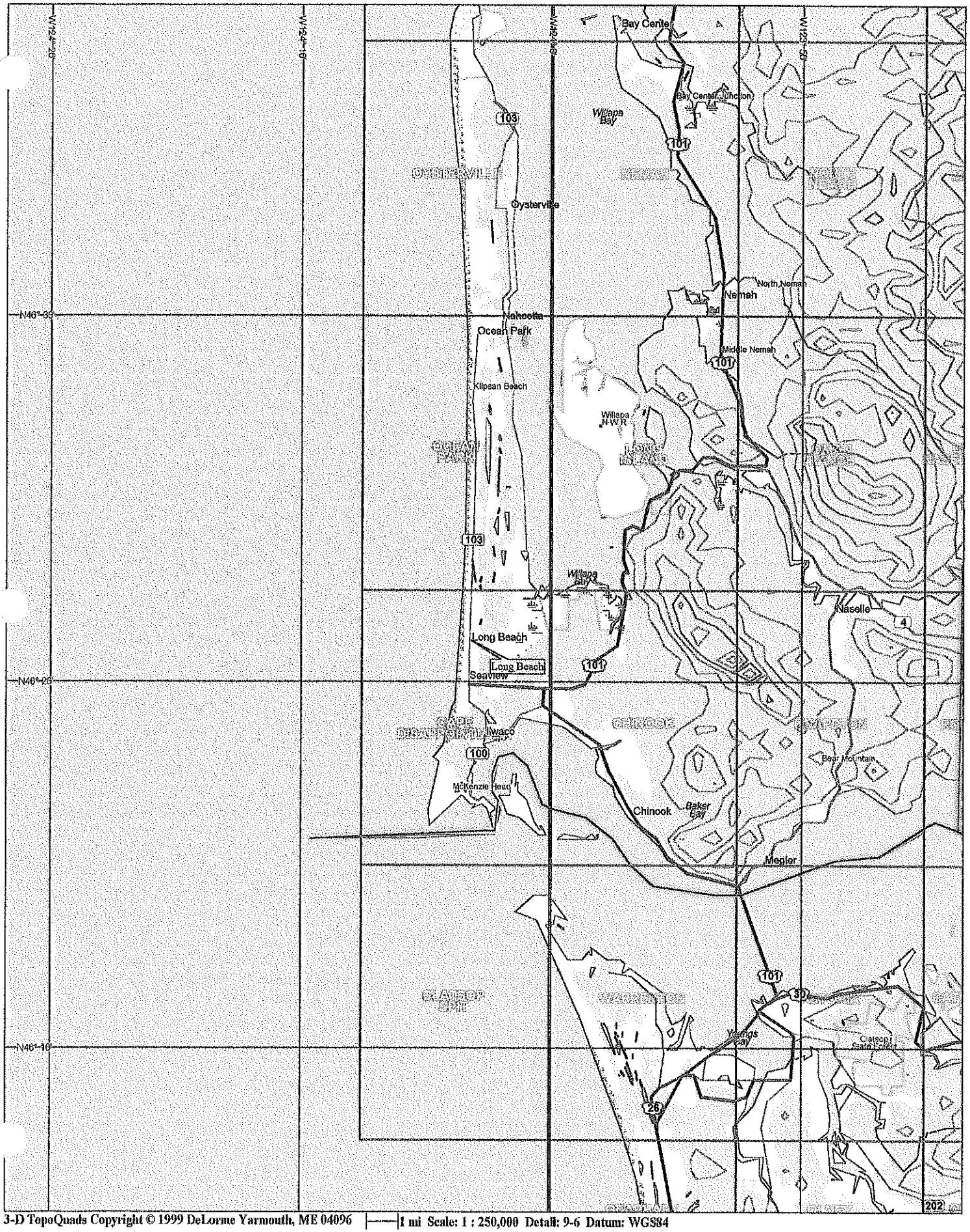
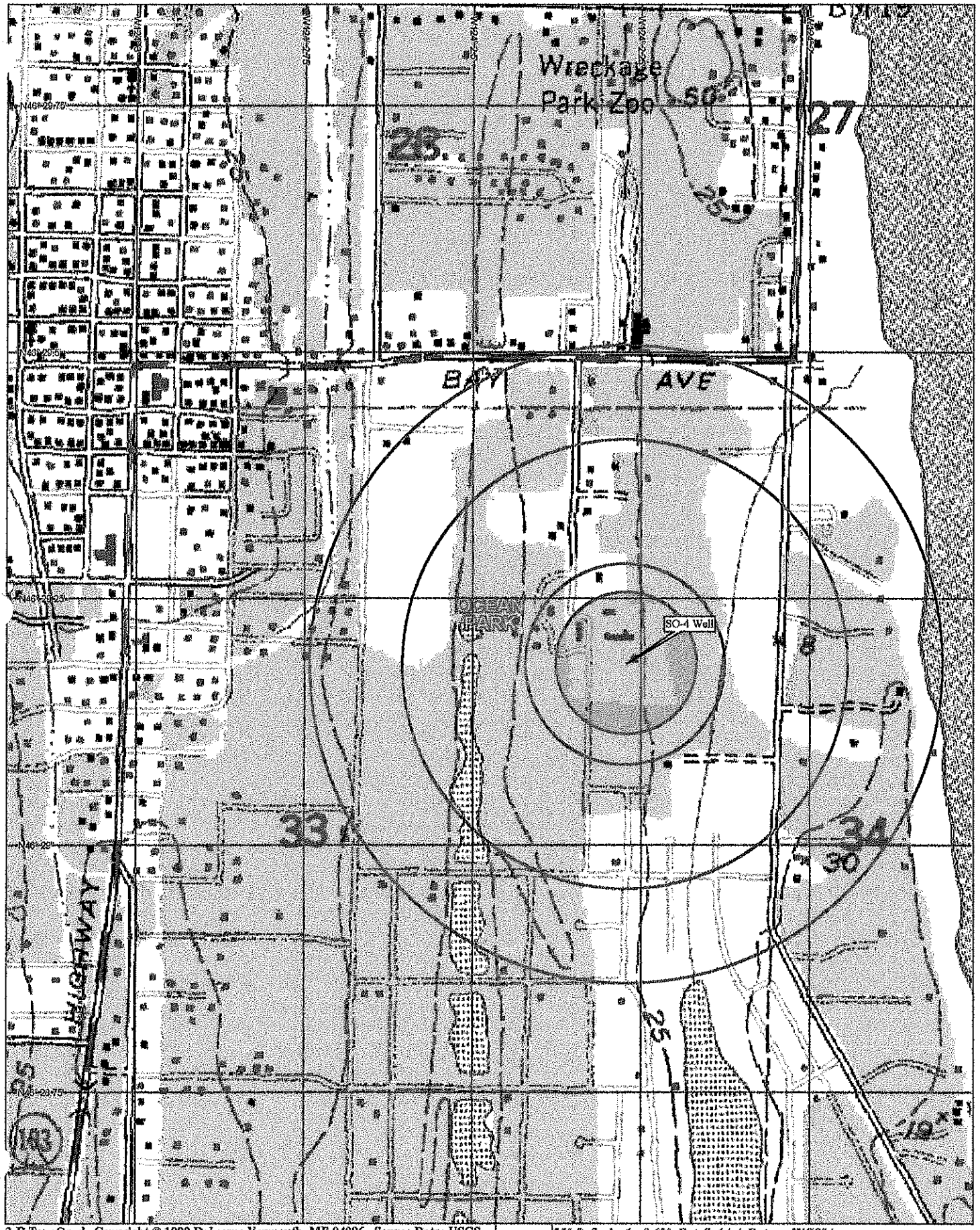
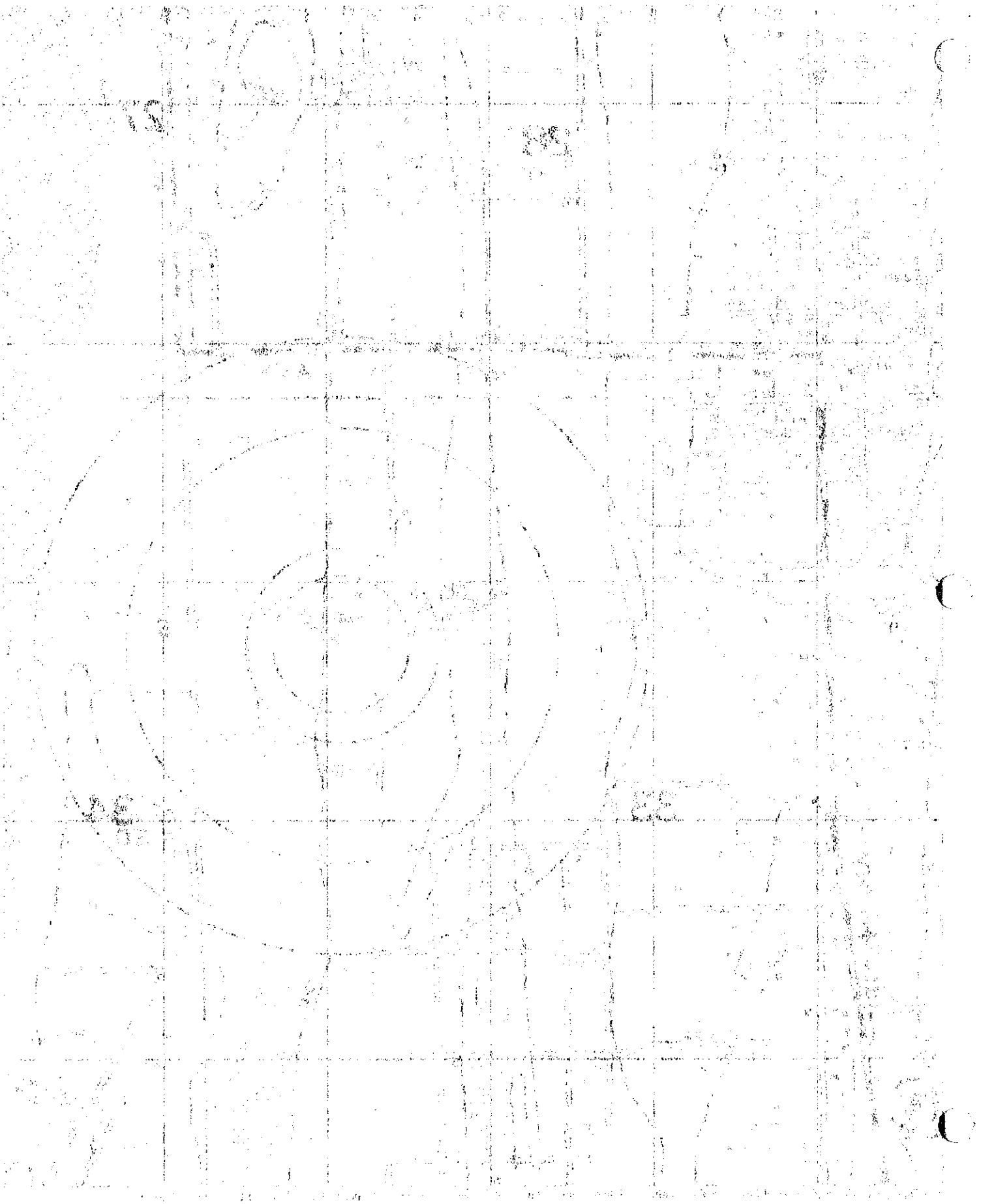
ECY 050-1-20 (9/93)

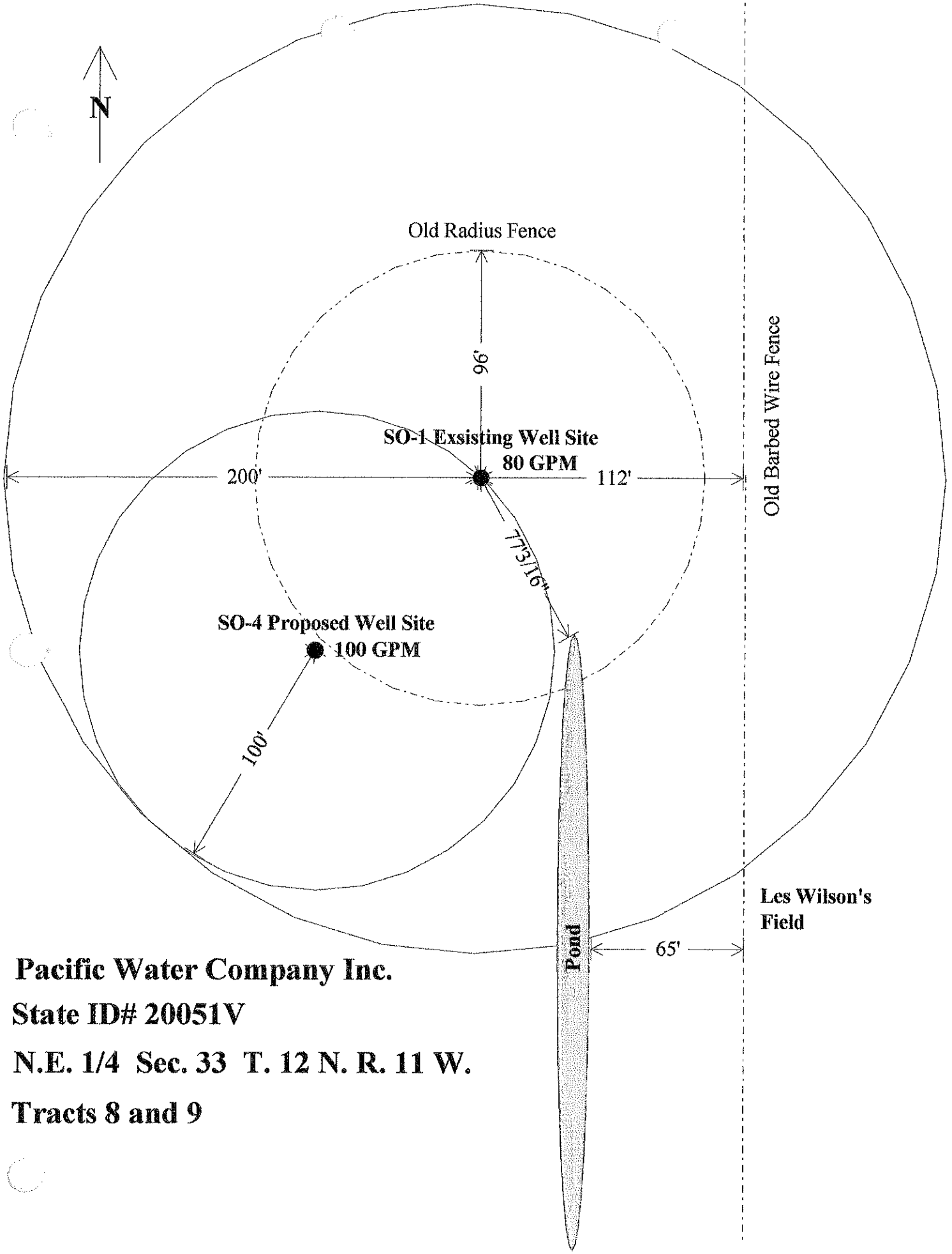


 1 mi Scale: 1 : 250,000 Detail: 9-6 Datum: WGS84



 350 ft Scale: 1 : 9,600 Detail: 14-4 Datum: WGS84





Pacific Water Company Inc.

State ID# 20051V

N.E. 1/4 Sec. 33 T. 12 N. R. 11 W.

Tracts 8 and 9

Ground Water Contamination
Susceptibility Assessment Survey Form
Version 2.1b

IMPORTANT! Please complete one form for each ground water source (well, wellfield, spring) used in your water system. Photocopy as necessary.

PART I: System Information

Well owner/manager : Pacific Water Company Inc./Phillip C. Leach Pres. Water Treatment Plant Operator 3

Water system name : Pacific Water Company, Inc.

County: Pacific

Water system number: 2005IV Source number: SO-1

Well depth: 56 (ft.) (*From WFI form*)

Source name: Well number 1 at Old Farm

WA well identification tag number:___ ___ ___-___ ___ ___

___x___ well not tagged

Number of connections: _____ Population served: _____

Township: 12N Range: 11W

Section: 33 1/4 1/4 Section: NW/NE

Latitude/longitude (if available): 462920 / 240211

How was lat./long. determined?

_____ global positioning device ___x___ survey _____ topographic map
____other: U.S. Geological Survey

* Please refer to Assistance Packet for details and explanations of all questions in Parts II through V.

PART II: Well Construction and Source Information

1) Date well originally constructed: 8 / 1 / 53 month/day/year

last reconstruction: 3 /27 /95 month/day/year

_____ information unavailable

2) Well driller: A.M. Jannsen Drilling Company

21075 S.W. T.V. Hwy

Aloha, Oregon 97006 (503) 649-5015

___ well driller unknown

3) Type of well:

___Drilled: _x_ rotary ___ bored ___ cable (percussion) ___ Dug

___ Other: ___ spring(s) ___ lateral collector (Ranney)

___ driven ___ jetted ___ other: _____

Additional comments: _____

_____

4) Well report available? _x_ YES (attach copy to form) ___ NO

If no well log is available, please attach any other records documenting well construction; e.g. boring logs, "as built" sheets, engineering reports, well reconstruction logs.

5) Average pumping rate: 83 (gallons/min)

Source of information: Gardner Engineers, Inc. Report (copy)

If not documented, how was pumping rate determined? _____

_____

___ Pumping rate unknown

6) Is this source treated?

If so, what type of treatment:

_x_ disinfection ___ filtration ___ carbon filter ___ air stripper ___ other

Purpose of treatment (describe materials to be removed or controlled by treatment):

_____

_____

7) If source is chlorinated, is a chlorine residual maintained: _x_ YES ___ NO

Residual level: 0.4mg/L (*At the point closest to the source.*)

PART III: Hydrogeologic Information

1) Depth to top of open interval: [check one]

___ < 20 ft _x_ 20–50 ft ___ 50–100 ft ___ 100–200 ft ___ >200 ft

___ information unavailable *('< ' means less than; '> ' means greater than)*

2) Depth to ground water (static water level):

_x_ < 20 ft ___ 20–50 ft ___ 50–100 ft ___ >100 ft

___ flowing well/spring (artesian)

How was water level determined?

_x_ well log ___ other: _____

__ depth to ground water unknown

3) If source is a flowing well or spring, what is the confining pressure:

_____ psi (pounds per square inch)
or
_____ feet above wellhead

4) If source is a flowing well or spring, is there a surface impoundment, reservoir, or catchment associated with this source: ___ YES ___ NO

5) Wellhead elevation (height above mean sea level): 20 (ft)

How was elevation determined? ___ topographic map ___ Drilling/Well Log ___ altimeter

___ other: U.S. Geological Survey

___ information unavailable

6) Confining layers: (This can be completed only for those sources with a drilling log, well log or geologic report describing subsurface conditions. Please refer to assistance package for example.)

___ evidence of a confining layer in well log

_x_ no evidence of a confining layer in well log

If there is evidence of a confining layer, is the depth to ground water more than 20 feet above the **bottom of the lowest confining layer?** ___ YES ___ NO

___ information unavailable

7) Sanitary setback:

___ < 100 ft* ___ 100-120 ft x 120-200 ft ___ > 200 ft
* if less than 100 ft describe the site conditions:

8) Wellhead construction:

x x wellhead enclosed in a wellhouse

x controlled access (describe): Lock on Well House Private Property

___ other uses for wellhouse (describe): Aux. Generator Power in adjacent Building small maintenance shed

___ no wellhead control

9) Surface seal:

x 18 ft

___ < 18 ft (no Department of Ecology approval) ('< ' *means less than*)

___ < 18 ft (Approved by Ecology, include documentation) ('< ' *means less than*)

___ > 18 ft ('> ' *means greater than*)

___ depth of seal unknown

___ no surface seal

10) Annual rainfall (inches per year):

___ < 10 in/yr ___ 10-25 in/yr x > 25 in/yr

PART IV: Mapping Your Ground Water Resource

1) Annual volume of water pumped: 360,000 (gallons)

How was this determined?

_x_ meter

___ estimated: ___ pumping rate (_____)

___ pump capacity (_____)

___ other: _____

2) "Calculated Fixed Radius" estimate of ground water movement:
(see Instruction Packet)

6 month ground water travel time : 140 (ft)

1 year ground water travel time : 200 (ft)

5 year ground water travel time: 440 (ft)

10 year ground water travel time: 620 (ft)

Information available on length of screened/open interval?

_x_ YES ___ NO

Length of screened/open interval: 15 (ft)

3) Is there a river, lake, pond, stream, or other obvious surface water body within the 6 month time of travel boundary? ___ YES _x_ NO (mark and identify on map).

4) Is there a stormwater and/or wastewater facility, treatment lagoon, or holding pond located within the 6 month time of travel boundary? ___ YES _x_ NO (mark and identify on map).

Comments: _____

_____

_____

_____

_____

PART V: Assessment of Water Quality

1) Regional sources of risk to ground water:

Please indicate if any of the following are present within a circular area around your water source having a radius up to and including the five year ground water travel time:

	6 month	1 year	5 year	unknown
likely pesticide application	____	____	____	____
stormwater injection wells	____	____	____	____
other injection wells	____	____	____	____
abandoned ground water well	____	____	____	____
landfills, dumps, disposal areas	____	____	____	____
known hazardous materials clean-up site	____	____	____	____
water system(s) with known quality problems	____	____	____	____
population density > 1 house/acre	____	____	____	____
residences commonly have septic tanks	____	____	____	____
Wastewater treatment lagoons	____	____	____	____
sites used for land application of waste	____	____	____	____

Mark and identify on map any of the risks listed above which are located within the 6 month time of travel boundary? (*Please include a map of the wellhead and time of travel areas with this form. Please locate and mark any of the following.*)

If other recorded or potential sources of ground water contamination exist within the ten year time of travel circular zone around your water supply, please describe:

2) Source specific water quality records:

Please indicate the occurrence of any test results since 1986 that meet the following conditions: (Unless listed on assessment, MCLs are listed in assistance package.)

A. Nitrate: (Nitrate MCL = 10 mg/l)	YES	NO
Results greater than MCL		X
< 2 mg/liter nitrate	X	X
2–5 mg/liter nitrate		X
> 5 mg/liter nitrate		X
___ Nitrate sampling records unavailable		

B. VOCs: (VOC detection level 0.5 ug/l or 0.0005 mg/l.)	YES	NO
Results greater than MCL or SAL		X
VOCs detected at least once		X
VOCs never detected	X	X
___ VOC sampling records unavailable		

C. EDB/DBCP:	YES	NO
(EDB MCL = 0.05 ug/l or 0.00005 mg/l. DBCP MCL = 0.2 ug/l or 0.0002 mg/l.)		
EDB/DBCP detected below MCL at least once		X
EDB/DBCP detected above MCL at least once		X
EDB/DBCP never detected		X
___ EDB/DBCP tests required but not yet completed		
X EDB/DBCP tests not required		

D. Other SOCs (Pesticides):	YES	NO	
Other SOCs detected		X	may not have been tested.
(pesticides and other synthetic organic chemicals)			

___ Other SOC tests performed but none detected
(list test methods in comments
___ Other SOC tests not performed

If any SOCs in addition to EDB/DBCP were detected, please identify and date. If other SOC tests were performed, but no SOCs detected, list test methods here: _____

_____

_____

_____

E. Bacterial contamination:

	YES	NO
Any bacterial detection(s) in the past 3 years in samples taken from the source (not distribution sampling records).	____	x
Has source (in past 3 years) had a bacteriological contamination problem found in distribution samples that was attributed to the source.	____	x

___ Source sampling records for bacteria unavailable

Part VI: Geographic or Hydrologic Factors Contributing to a Non-Circular Zone of Contribution

The following questions will help identify those ground water systems which may not be accurately represented by the calculated fixed radius (CFR) method described in Part IV. For these sources, the CFR areas should be used as a preliminary delineation of the critical time of travel zones for that source. As a system develops its Wellhead Protection Plan for theses sources, a more detailed delineation method should be considered.

1) Is there evidence of obvious hydrologic boundaries within the 10 year time of travel zone of the CFR? (Does the largest circle extend over a stream, river, lake, up a steep hillside, and/or over a mountain or ridge?)

___ YES X NO

Describe with references to map produced in Part IV:

_____

_____

2) Aquifer Material:

A) Does the drilling log, well log or other geologic/engineering reports identify that the well is located in an area where the underground conditions are identified as fractured rock and/or basalt terrain?

___ YES x NO

B) Does the drilling log, well log or other geologic/engineering reports indicate that the well is located in an area where the underground conditions are primarily identified as coarse sand and gravel?

___ YES x NO

3) Is the source located in an aquifer with a high horizontal flow rate? (These can include sources located on flood plains of large rivers, artesian wells with high water pressure, and/or shallow flowing wells and springs.)

___ YES x NO

4) Are there other high capacity wells (agricultural, municipal and/or industrial) located within the CFRs?

a) Presence of ground water extraction wells removing more than approximately 500 gal/min within...

	YES	NO	unknown
< 6 month travel time	___	x	___
6 month–1 year travel time	___	x	___
1–5 year travel time	___	x	___
5–10 year travel time	___	x	___

b) Presence of ground water recharge wells (dry wells) or heavy irrigation within...

	YES	NO	unknown
< 1 year travel time	___	x	___
1–5 year travel time	___	x	___
5–10 year travel time	___	x	___

Please identify or describe additional hydrologic or geographic conditions that you believe may affect the shape of the zone of contribution for this source. Where possible, reference them to locations on the map produced in Part IV.

Suggestions and Comments

Did you attend one of the susceptibility workshops? ___ YES X NO

Did you find it useful? ___ YES ___ NO

Did you seek outside assistance to complete the assessment? ___ YES X NO

This form and instruction packet are still in the process of development. Your comments, suggestions and questions will help us upgrade and improve this assessment form. If you found particular sections confusing or problematic please let us know. How could this susceptibility assessment be improved or made clearer? Did the instruction package help you find the information needed to complete the assessment? How much time did it take you to complete the form? Were you able to complete the assessment without additional/outside expertise? Do you feel the assessment was valuable as a learning experience? Any other comments or constructive criticisms you have would be appreciated.

WATER WELL REPORT
STATE OF WASHINGTON

File Original and First Copy with the Division of Water Resources
Second Copy — Owner's Copy
Third Copy — Driller's Copy

#1

Application No. 7132
Permit No. ....

(1) OWNER:
Name Coos Bay Development, Well #1
Address Ocean Park, Washington

(2) LOCATION OF WELL:
County Pacific Owner's number, if any
SE ¼ NE ¼ Section 33 T. 12 R. 11 W.M.
Bearing and distance from section or subdivision corner
being located on Tract 9, of Rushton on the Bay, as per plat recorded in Vol. D of plats, page 182, records of Pacific County Wash. (~~1320' E 730' S of~~ N 4 cor 33)

(3) TYPE OF WORK (check):
New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 11.

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

(5) TYPE OF WELL:
Rotary ☒ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(6) CASING INSTALLED: Threaded ☐ Welded ☒
8 " Diam. from 0 ft. to 41 ft. Gage .277
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(7) PERFORATIONS: Perforated? ☐ Yes ☒ No
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(8) SCREENS: Well screen installed ☒ Yes ☐ No
Manufacturer's Name Johnson
Type Stainless Steel Model No. 304
Diam. 8" Slot size #20 Set from 41 ft. to 56 ft.
Diam. Slot size Set from ft. to ft.

(9) CONSTRUCTION:
Was well gravel packed? ☒ Yes ☐ No Size of gravel: 3/32"
Gravel placed from 20 ft. to 56 ft.
Was a surface seal provided? ☒ Yes ☐ No To what depth? 20 ft.
Material used in seal - Clay
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? Depth of strata
Method of sealing strata off

(10) WATER LEVELS:
Static level 15 ft. below land surface Date 8/53
Artesian pressure lbs. per square inch Date
Water is controlled by (Cap, valve, etc.)

(11) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes, by whom? Driller
Yield: 140 gal./min. with 30 ft. drawdown after 4 hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level

Date of test 8/53
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? ☐ Yes ☒ No

(12) WELL LOG: Diameter of well 8 inches.
Depth drilled 56 ft. Depth of completed well 56 ft.

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Fine Sand	0	56

Pacific Water Co
Sc1

Work started 19 Completed 8/53 19

(13) PUMP:
Manufacturer's Name
Type H.P.

Well Driller's Statement:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME A. M. Jannsen Drilling Company
(Person, firm, or corporation) (Type or print)
Address 21075 S. W. T. V. Hwy., Aloha, Oregon
[Signed] Edward M. Jannsen
(Well Driller)
License No. 79 Date 7/30 19 53

USE ADDITIONAL SHEETS IF NECESSARY

S. F. No. 7356—(Rev. 9-62)—8-62 3M 75108

S. F. No. 7361—(Rev. 8-70)

CERTIFICATE RECORD NO. EXHIBIT III-3 PAGE NO. G 2-00174 C

STATE OF WASHINGTON, COUNTY OF Pacific

CERTIFICATE OF GROUND WATER RIGHT

(Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology thereunder.)

THIS IS TO CERTIFY That OCEAN BAY WATER COMPANY

of Seattle, Washington, has made proof to the satisfaction of the Department of Ecology of a right to the use of the public ground waters of the State of Washington from two (2) wells

located within NW¼NE¼ and Tract C of the plat of Rushton-on-the-Bay,

Sec. 33, Twp. 12 N., R. 11 W.W.M.,

for the purpose(s) of community domestic supply

under and specifically subject to provisions contained in Ground Water Permit No. 10351 issued by the Department of Ecology and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the Department of Ecology and entered of record in Volume - at page 1, G 2-00174 C; that the priority of the right hereby confirmed dates from December 15, 1969; that the quantity of ground water under the right hereby confirmed for the aforesaid purposes, is limited to an amount actually beneficially used for said purposes, and shall not exceed 500 gallons per minute; 168 acre-feet per year, during entire year for community domestic supply.

A description of the lands to which such ground water right is appurtenant is as follows:

The plats of Rushton-on-the-Bay; Rushlight Farm Estates; and South Addition to Ocean Park; ALL within Sec. 33, T. 12 N., R. 11 W.W.M.

The right to use of water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390 and 90.44.020.

This certificate of ground water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

Given under my hand and seal of this office at Olympia, Washington, this 17th day of August, 19 72.

JOHN A. BIGGS, Director
Department of Ecology

by

Engineering Data

OK

DATE PRINTED: 01/19/95

Health
Environmental Health

WATER FACILITIES INVENTORY (WFI)

Read Instructions on back before completing

DATE UPDATED: 02/17/94

SYSTEM ID NO.	2. COUNTY	GROUP	TYPE	WRIA
20031V	PACIFIC	A	COMM	24

3. SYSTEM NAME: PACIFIC WATER COMPANY INC

STREET ADDRESS:

P.O. BOX (IF APPLICABLE): P.O. BOX 982

CITY: LONG BEACH | STATE: WA | ZIP CODE: 98631

4. OWNER'S NAME (LAST, FIRST): LEACH, PHILLIP C. | OWNER NO.: 10183

STREET ADDRESS: PO BOX 982

P.O. BOX (IF APPLICABLE):

CITY: LONG BEACH | STATE: WA | ZIP CODE: 98631

5. SYSTEM CONTACT PERSON: PHILLIP C. LEACH - MANAGER | TITLE:

DAY TELEPHONE: 206-777-8786 | EVENING TELEPHONE: 206-777-8238

6. OWNERSHIP (CHECK ONE ONLY)

- [ ] PRIVATE: NON-PROFIT
- [ ] PRIVATE: FOR-PROFIT
- [ ] LOCAL GOVERNMENT (COUNTY / CITY / PUD / WATER DISTRICT)
- [ ] STATE
- [ ] FEDERAL

7. PREDOMINANT CHARACTERISTIC (CHECK ONE ONLY)

- [X] RESIDENTIAL
- [ ] RECREATIONAL
- [ ] BUSINESS / INDUSTRIAL / AGRICULTURAL / COMMERCIAL
- [ ] LODGING / FOOD SERVICE
- [ ] SCHOOL / DAY CARE
- [ ] OTHER (CHURCHES, ETC.)

WFI COMPLETED BY: Phillip C Leach | TITLE: Pres.

DAY TELEPHONE: 360-777-8786 | DATE: 3-19-95

8. SUBMITTED FOR:

- [ ] NEW SYSTEM
- [ ] SYSTEM NAME CHANGE*
- [ ] NO CHANGE
- [X] UPDATE
- [ ] REACTIVATE
- [ ] DELETE

*OLD SYSTEM NAME - ENTER ONLY IF CHANGING WITH **THIS** WFI

SYSTEMS SERVING ANY RESIDENTS (PEOPLE LIVING IN A DWELLING SERVED BY THE SYSTEM), COMPLETE THIS SECTION

9. NUMBER ACTIVE RESIDENTIAL CONNECTIONS	10. NUMBER ACTIVE RESIDENTIAL POPULATION
~~80~~ 80	~~200~~ 200

SYSTEMS SERVING ANY NON-RESIDENTS (I.E., TRAVELERS, EMPLOYEES, STUDENTS, ETC.), COMPLETE THIS SECTION

11. NUMBER NON-RESIDENTIAL CONNECTIONS: 140

12. ENTER AVERAGE DAILY NON-RESIDENTIAL POPULATION SERVED FOR EACH MONTH. MAKE ENTRY FOR EACH MONTH

JAN	10	APR	10	JUL	150	OCT	10
FEB	10	MAY	25	AUG	150	NOV	10
MAR	10	JUN	150	SEP	10	DEC	10

13. DOES THE SYSTEM SERVE AT LEAST 25 OF THE SAME NON-RESIDENTS FOR 4 OR MORE DAYS PER WEEK FOR AT LEAST 180 DAYS PER YEAR?

[ ] YES [X] NO

14. TOTAL NUMBER CONNECTIONS METERED	15. DISTRIBUTION RESERVOIR(S) TOTAL CAPACITY
~~80~~ 182	2,000 GALLONS

16. DOH SOURCE NUMBER	17. SOURCE NAME (LIST UTILITY'S NAME FOR SOURCE. IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S ID # AND NAME USING FOLLOWING FORMAT: XXXXX / NAME EXAMPLE: 77050Y / SEATTLE)	18. SOURCE CATEGORY: WELL	WELL FIELD	SURFACE	SPRING	RANNEY / INF. GAL	INTERTIE	PURCHASE-TREATED	PURCHASE-UNTREATED	19. USE: PERMANENT	SEASONAL	EMERGENCY	20. SOURCE METERED	21. TREATMENT: NONE	CHLORINATION	FILTRATION	FLUORIDATION	OTHER	22. WELL DEPTH (FEET)	23. SOURCE CAPACITY (GPM)	24. SOURCE LOCATION: 1/4, 1/4 SEC.	SEC. NO.	TWP	RNG.	SWTR EVALUATION / VOC EVALUATION
001	WELL #1	X								X				X					56	140	SE/NE	33	12N	11W	
002	WELL #2	X								X				X					100	250	NW/NE	33	12N	11W	
003	WELL 3	X												X					100	80	SW/NE	33	00N		

MINIMUM REQUIRED BACTERIOLOGICAL SAMPLING SCHEDULE

25.	26.	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
		1	1	1	1	1	1	1	1	1	1	1	1

APPROVED SERVICES (PER PLANS): 279 | DATE OF LAST SANITARY SURVEY: 00 0000 | BY DOH [ ] | LHD [ ]

SYSTEM IN CRITICAL WATER SUPPLY SERVICE AREA? [X] YES [ ] NO | GW MGMT AREA? [ ] YES [ ] NO | FOR LHD USE ONLY

EFFECTIVE DATE RETRO. CHANGES | SIGNATURE OF DOH REVIEWER | DATE

DOH 331-011 (Rev. 5/92)

WATER SYSTEM

Please Print Plainly and Heavily

State of Washington
Department of Health
PUBLIC HEALTH LABORATORIES
1610 NE 150th Street, Seattle, WA 98155-9701 Tel. (206) 361-2898

WATER SAMPLE INFORMATION FOR INORGANIC CHEMICAL ANALYSES

DO NOT WRITE IN SHADED AREAS. PLEASE FILL BOXES NUMBERED 1 THRU 14. SEE BACK FOR INSTRUCTIONS

LABORATORY NUMBER: 511 5215

DATE RECEIVED: 3-15-95

1. DATE COLLECTED: 3-13-95

2. SYSTEM NAME: Pacific Water Comp. Inc.

3. SYSTEM ID #: 20051V

4. CIRCLE GROUP: (A) B

5. COUNTY: Pacific

6. SOURCE TYPE:
- ☐ SURFACE
- ☒ WELL
- ☐ SPRING
- ☐ PURCHASE

7. SAMPLE TAKEN:
- ☐ BEFORE TREATMENT
- ☒ AFTER TREATMENT

8. SOURCE NO.: SO-1

9. SOURCE NAME: Old Farm

10. COLLECTED BY: Phil Leach

TELEPHONE: (360) 777-8786

11. IF TAKEN AFTER TREATMENT, CHECK TREATMENT:
- ☐ FLUORIDATION
- ☒ CHLORINATION
- ☐ FILTRATION
- ☐ WATER SOFTENER,
  TYPE: _____
- ☐ OTHER: _____

12. IF TAKEN FROM DISTRIBUTION, INDICATE ADDRESS:

SO-1 Pump House

13. PARTY TO PAY FOR TESTING:

SIGNATURE: Phillip C Leach

NAME: Phillip C Leach

ADDRESS: BOX 982
Long Beach WA.
98631

TELEPHONE: 360) 777-8238

14. REMARKS: (water quality problems, address for extra copies, etc.)

IRB problem, Well Tech. Rehab. Corp. coming on thru. 3-16-95 to Rehab. Well. Will send another Sample after Rehab. is done.
Phil Leach. Pres.

LABORATORY REPORT
(DO NOT WRITE INSIDE THIS BOX)

TESTS		MCL[1]	LESS THAN <	RESULTS	UNITS	COMPLIANCE YES	COMPLIANCE NO	CHEMIST INITIALS
Antimony P	Sb	0.006	<	0.002	mg/l	✓		CRW
Arsenic P	As	0.05	<	0.005	mg/l	✓		JDM
Barium P	Ba	2.0	<	0.10	mg/l	✓		PG/JDW
Beryllium P	Be	0.004	<	0.003	mg/l	✓		PG/JDW
Cadmium P	Cd	0.005	<	0.001	mg/l	✓		JDM
Chromium P	Cr	0.1	<	0.010	mg/l	✓		PG/JDW
Copper P	Cu	~~1.0~~ *	<	0.2	mg/l	✓		PG/JDW
Iron	Fe	0.3		0.24	mg/l	✓		PG/JDW
Lead P	Pb	~~0.05~~ *	<	0.002	mg/l	✓		JDM
Manganese	Mn	0.05		0.030	mg/l	✓		PG/JDW
Mercury P	Hg	0.002	<	.0005	mg/l	✓		KK
Nickel P	Ni	0.1	<	0.02	mg/l	✓		PG/JDW
Selenium P	Se	0.05	<	0.005	mg/l	✓		JDM
Silver	Ag	0.1	<	0.010	mg/l	✓		PG/JDW
Sodium P	Na			8	mg/l			PG/JDW
Thallium P	Tl	0.002	<	0.001	mg/l	✓		CRW
Zinc	Zn	5.0	<	0.2	mg/l	✓		PG/JDW
Hardness				29	mg/l as $CaCO_3$			PG/JDW
Conductivity		700		110	µmhos/cm 25° C	✓		
Turbidity P		1.0		0.2	NTU	✓		
Color		15.0		10.0	Color Units	✓		
Chloride	Cl	250		10	mg/l	✓		KK
Cyanide P	CN	0.2	<	0.005	mg/l	✓		JDM
Fluoride P	F	2.0	<	0.2	mg/l	✓		
Nitrate P	as N	10.0		0.9	mg/l	✓		KK
Nitrite P	as N	1.0	<	0.05	mg/l	✓		KK
Sulfate	SO_4	250			mg/l			
TDS		500			mg/l			

LABORATORY COMMENTS:
CN tested at Lauck's. Work order # 95-03-590

NOT A BILL - CRW
CHARGE: ~~$50.00~~ Invoice to follow

LABORATORY SUPERVISOR:

DATE OF REPORT: 4/4/95

1 - MCL: Maximum Contamination Level. ~~This is the State MCL~~ Federal Action Levels are 0.015 mg/L for Lead and 1.3 mg/L for Copper; P - Primary Standard; TDS - Total Dissolved Solids

DOH 307-001 (7/94) Fremo

WATER SUPPLIER COPY

COOS BAY DEVELOPMENT August 1953
Ocean Park, Wash.

Well #1
0-56 fine sand
Drilled 20" diameter hole
casing 41ft of 8" I.D.
Screen 15 ft #20 slot Johnson Stainless Steel
type 304 with std. fittings
Gravel 3/32 minus app. 15 yds.
Static water level 15 ft below surface tested
to 140 gpm at 45 ft. pumping level

Pacific Water Co.
#2005/V
SO1

Ground Water Contamination
Susceptibility Assessment Survey Form
Version 2.1b

IMPORTANT! Please complete one form for each ground water source (well, wellfield, spring) used in your water system. Photocopy as necessary.

PART I: System Information

Well owner/manager : ~~Pacific Water Company, Inc./Phillip C. Leach Pres~~ Water Treatment Plant Operator 3

Water system name : Pacific Water Company, Inc.

County: Pacific

Water system number: 2005IV Source number: SO-2

Well depth: 100 (ft.) (*From WFI form*)

Source name: Well No. 2 at Broadway Ave

WA well identification tag number: ___ ___ ___-___ ___ ___

___X___ well not tagged

Number of connections: _____ Population served: _____

Township: 12N Range: 11W

Section: 33 1/4 1/4 Section: NW/NE

Latitude/longitude (if available): 462923 / 1240302

How was lat./long. determined?

_____ global positioning device ___x___ survey _____ topographic map
___other: U.S. Geological Survey

* Please refer to Assistance Packet for details and explanations of all questions in Parts II through V.

PART II: Well Construction and Source Information

1) Date well originally constructed: 8 / 1 / 53 month/day/year

last reconstruction: ___ / ___ /___ month/day/year

_____ information unavailable

2) Well driller: A.M. Jannsen Drilling Company

21075 S.W.T.V. Hwy

Aloha, OR 97006 (503) 649-5015

___ well driller unknown

3) Type of well:

___Drilled: x rotary ___ bored ___ cable (percussion) ___ Dug

___ Other: ___ spring(s) ___ lateral collector (Ranney)

___ driven ___ jetted ___ other: _____

Additional comments: _____

4) Well report available? x YES (attach copy to form) ___ NO

If no well log is available, please attach any other records documenting well construction; e.g. boring logs, "as built" sheets, engineering reports, well reconstruction logs.

5) Average pumping rate: 230 (gallons/min)

Source of information: Gardner Engineers, Inc. Report

If not documented, how was pumping rate determined? _____

___ Pumping rate unknown

6) Is this source treated?

If so, what type of treatment:

x disinfection ___ filtration ___ carbon filter ___ air stripper ___ other

Purpose of treatment (describe materials to be removed or controlled by treatment):

7) If source is chlorinated, is a chlorine residual maintained: x YES ___ NO

Residual level: 0.4 mg/L (*At the point closest to the source.*)

PART III: Hydrogeologic Information

1) Depth to top of open interval: [check one]

___ < 20 ft ___ 20–50 ft _X_ 50–100 ft ___ 100–200 ft ___ >200 ft

___ information unavailable *('< ' means less than; '> ' means greater than)*

2) Depth to ground water (static water level):

_X_ < 20 ft ___ 20–50 ft ___ 50–100 ft ___ >100 ft

___ flowing well/spring (artesian)

How was water level determined?

_X_ well log ___ other: _____

___ depth to ground water unknown

3) If source is a flowing well or spring, what is the confining pressure:

_____ psi (pounds per square inch)
or
_____ feet above wellhead

4) If source is a flowing well or spring, is there a surface impoundment, reservoir, or catchment associated with this source: ___ YES ___ NO

5) Wellhead elevation (height above mean sea level): _____ (ft)

How was elevation determined? ___ topographic map ___ Drilling/Well Log ___ altimeter

___ other: _____

_x_ information unavailable

6) Confining layers: (This can be completed only for those sources with a drilling log, well log or geologic report describing subsurface conditions. Please refer to assistance package for example.)

___ evidence of a confining layer in well log

_X_ no evidence of a confining layer in well log

If there is evidence of a confining layer, is the depth to ground water more than 20 feet above the **bottom** of the **lowest confining layer**? ___ YES ___ NO

___ information unavailable

7) Sanitary setback:

___ < 100 ft* x 100–120 ft ___ 120–200 ft ___ > 200 ft
* if less than 100 ft describe the site conditions:

8) Wellhead construction:

x wellhead enclosed in a wellhouse

x controlled access (describe): Gates, locked. Lock on well house

___ other uses for wellhouse (describe): _____

___ no wellhead control

9) Surface seal:

x 18 ft

___ < 18 ft (no Department of Ecology approval) *('< ' means less than)*

___ < 18 ft (Approved by Ecology, include documentation) *('< ' means less than)*

___ > 18 ft *('> ' means greater than)*

___ depth of seal unknown

___ no surface seal

10) Annual rainfall (inches per year):

___ < 10 in/yr ___ 10–25 in/yr x > 25 in/yr

PART IV: Mapping Your Ground Water Resource

1) Annual volume of water pumped 6,700,000 (gallons)

How was this determined?

_x_ meter

___ estimated: ___ pumping rate (_____)

___ pump capacity (_____)

___ other: _____

2) "Calculated Fixed Radius" estimate of ground water movement:
(see Instruction Packet)

6 month ground water travel time : 200 (ft)

1 year ground water travel time : 280 (ft)

5 year ground water travel time: 620 (ft)

10 year ground water travel time: 880 (ft)

Information available on length of screened/open interval?

_x_ YES ___ NO

Length of screened/open interval: 15 (ft)

3) Is there a river, lake, pond, stream, or other obvious surface water body within the 6 month time of travel boundary? _x_ YES ___ NO (mark and identify on map).

4) Is there a stormwater and/or wastewater facility, treatment lagoon, or holding pond located within the 6 month time of travel boundary? ___ YES _x_ NO (mark and identify on map).

Comments: _____

_____

_____

_____

_____

PART V: Assessment of Water Quality

1) Regional sources of risk to ground water:

Please indicate if any of the following are present within a circular area around your water source having a radius up to and including the five year ground water travel time:

	6 month	1 year	5 year	unknown
likely pesticide application	____	____	____	____
stormwater injection wells	____	____	____	____
other injection wells	____	____	____	____
abandoned ground water well	____	____	____	____
landfills, dumps, disposal areas	____	____	____	____
known hazardous materials clean-up site	____	____	____	____
water system(s) with known quality problems	____	____	____	____
population density > 1 house/acre	____	____	____	____
residences commonly have septic tanks	____	X	____	____
Wastewater treatment lagoons	____	____	____	____
sites used for land application of waste	____	____	____	____

Mark and identify on map any of the risks listed above which are located within the 6 month time of travel boundary? (*Please include a map of the wellhead and time of travel areas with this form. Please locate and mark any of the following.*)

If other recorded or potential sources of ground water contamination exist within the ten year time of travel circular zone around your water supply, please describe:

Please note A on map. There are Seven mobile home sites with septic systems in that area. There is a potential for more development if the local Department of Health allows it. This is also our primary well site. This is a personal concern of ours, that we have not been contacted regarding these installations.

2) Source specific water quality records:

Please indicate the occurrence of any test results since 1986 that meet the following conditions: (Unless listed on assessment, MCLs are listed in assistance package.)

A. Nitrate: (Nitrate MCL = 10 mg/l)	YES	NO
Results greater than MCL	___	X
< 2 mg/liter nitrate	(X)	X
2-5 mg/liter nitrate	___	X
> 5 mg/liter nitrate	___	X
___ Nitrate sampling records unavailable		

B. VOCs: (VOC detection level 0.5 ug/l or 0.0005 mg/l.)	YES	NO
Results greater than MCL or SAL	___	X
VOCs detected at least once	___	X
VOCs never detected	(X)	X
___ VOC sampling records unavailable		

C. EDB/DBCP:	YES	NO
(EDB MCL = 0.05 ug/l or 0.00005 mg/l. DBCP MCL = 0.2 ug/l or 0.0002 mg/l.)		
EDB/DBCP detected below MCL at least once	___	X
EDB/DBCP detected above MCL at least once	___	X
EDB/DBCP never detected	___	X
___ EDB/DBCP tests required but not yet completed		
(X) EDB/DBCP tests not required		

D. Other SOCs (Pesticides):	YES	NO
Other SOCs detected	___	X
(pesticides and other synthetic organic chemicals)		

___ Other SOC tests performed but none detected
(list test methods in comments

___ Other SOC tests not performed

If any SOCs in addition to EDB/DBCP were detected, please identify and date. If other SOC tests were performed, but no SOCs detected, list test methods here: _____

_____

_____

_____

E. Bacterial contamination:

	YES	NO
Any bacterial detection(s) in the past 3 years in samples taken from the source (not distribution sampling records).	___	X
Has source (in past 3 years) had a bacteriological contamination problem found in distribution samples that was attributed to the source.	___	X

___ Source sampling records for bacteria unavailable

Part VI: Geographic or Hydrologic Factors Contributing to a Non-Circular Zone of Contribution

The following questions will help identify those ground water systems which may not be accurately represented by the calculated fixed radius (CFR) method described in Part IV. For these sources, the CFR areas should be used as a preliminary delineation of the critical time of travel zones for that source. As a system develops its Wellhead Protection Plan for theses sources, a more detailed delineation method should be considered.

1) Is there evidence of obvious hydrologic boundaries within the 10 year time of travel zone of the CFR? (Does the largest circle extend over a stream, river, lake, up a steep hillside, and/or over a mountain or ridge?)

X YES ___ NO

Describe with references to map produced in Part IV:

10 year travel zone has approximately 15 foot ridge

2) Aquifer Material:

A) Does the drilling log, well log or other geologic/engineering reports identify that the well is located in an area where the underground conditions are identified as fractured rock and/or basalt terrain?

___ YES X NO

B) Does the drilling log, well log or other geologic/engineering reports indicate that the well is located in an area where the underground conditions are primarily identified as coarse sand and gravel?

___ YES X NO

3) Is the source located in an aquifer with a high horizontal flow rate? (These can include sources located on flood plains of large rivers, artesian wells with high water pressure, and/or shallow flowing wells and springs.)

___ YES _X_ NO

4) Are there other high capacity wells (agricultural, municipal and/or industrial) located within the CFRs?

a) Presence of ground water extraction wells removing more than approximately 500 gal/min within...

	YES	NO	unknown
< 6 month travel time	___	X	___
6 month–1 year travel time	___	X	___
1–5 year travel time	___	X	___
5–10 year travel time	___	X	___

b) Presence of ground water recharge wells (dry wells) or heavy irrigation within...

	YES	NO	unknown
< 1 year travel time	___	X	___
1–5 year travel time	___	X	___
5–10 year travel time	___	X	___

Please identify or describe additional hydrologic or geographic conditions that you believe may affect the shape of the zone of contribution for this source. Where possible, reference them to locations on the map produced in Part IV.

Suggestions and Comments

Did you attend one of the susceptibility workshops? ___ YES _X_ NO

Did you find it useful? ___ YES ___ NO

Did you seek outside assistance to complete the assessment? ___ YES _X_ NO

This form and instruction packet are still in the process of development. Your comments, suggestions and questions will help us upgrade and improve this assessment form. If you found particular sections confusing or problematic please let us know. How could this susceptibility assessment be improved or made clearer? Did the instruction package help you find the information needed to complete the assessment? How much time did it take you to complete the form? Were you able to complete the assessment without additional/outside expertise? Do you feel the assessment was valuable as a learning experience? Any other comments or constructive criticisms you have would be appreciated.

-11 12

WATER WELL REPORT
STATE OF WASHINGTON

Application No. 7132

File Original and First Copy with the Division of Water Resources
Second Copy — Owner's Copy
Third Copy — Driller's Copy

Permit No. ....

(1) OWNER:
Name Coos Bay Development - Well #2
Address Ocean Park, Washington

(2) LOCATION OF WELL:
County Pacific Owner's number, if any
NW ¼ NE ¼ Section 33 T. 12 N R 11 W.M.
Bearing and distance from section or subdivision corner

1720 ft. S. & 1405 ft. E. of N¼ cor. 33
750 S & 650 E

(3) TYPE OF WORK (check):
New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 11.

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

(5) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(6) CASING INSTALLED:
Threaded ☐ Welded ☒
8 " Diam. from 0 ft. to 83 ft. Gage .277
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(7) PERFORATIONS:
Perforated? ☐ Yes ☒ No
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(8) SCREENS:
Well screen installed ☒ Yes XXXXXX
Manufacturer's Name Johnson Stainless Steel
Type Stainless Steel Model No 304
Diam. 8" Slot size #20 Set from 85 ft. to 100 ft.
Diam. Slot size Set from ft. to ft.

(9) CONSTRUCTION:
Was well gravel packed? ☒ Yes ☐ No Size of gravel: 3/32-
Gravel placed from 20 ft. to 100 ft.
Was a surface seal provided? ☒ Yes ☐ No To what depth? 20 ft.
Material used in seal: Clay
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? Depth of strata
Method of sealing strata off

(10) WATER LEVELS:
Static level 5 ft. below land surface Date 8/53
Artesian pressure lbs. per square inch Date
Water is controlled by (Cap, valve, etc.)

(11) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes, by whom? Driller
Yield: 250 gal./min. with 78 ft. drawdown after 4 hrs.
" " " " "
" " " " "
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level

Date of test 8/53
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? ☐ Yes ☐ No

(12) WELL LOG:
Diameter of well 8" inches.
Depth drilled 100 ft. Depth of completed well 100 ft.
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Fine Sand	0	43
Sand and Drift Wood	43	76
Fine Sand	76	100

Work started 8/53 19 Completed 8/53 19

(13) PUMP:
Manufacturer's Name
Type: H.P.

Well Driller's Statement:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME A. M. Jannsen Drilling Company
(Person, firm, or corporation) (Type or print)
Address 21075 S. W. T. V. Hwy., Aloha, Oregon
[Signed] Edward D. Jannsen
(Well Driller)
License No. 79 Date 7/30 19 64.

(USE ADDITIONAL SHEETS IF NECESSARY)

S. F. No. 7356 (Rev. 9-62) 8-62—3M. 75168

S. F. No. 1261—(Rev. 6-70)

CERTIFICATE RECORD NO. EXHIBIT III-C 3-00174 C PAGE NO.

STATE OF WASHINGTON, COUNTY OF Pacific

CERTIFICATE OF GROUND WATER RIGHT

(Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology thereunder)

THIS IS TO CERTIFY That OCEAN BAY WATER COMPANY

of Seattle, Washington, has made proof to the satisfaction of the Department of Ecology of a right to the use of the public ground waters of the State of Washington from two (2) wells

located within NW¼NE¼ and Tract C of the plat of Rushton-on-the-Bay,

Sec. 33, Twp. 12 N., R. 11 W.W.M.,

for the purpose(s) of community domestic supply

under and specifically subject to provisions contained in Ground Water Permit No. 10351 issued by the Department of Ecology and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the Department of Ecology and entered of record in Volume - at page 1 ; that the priority of the right hereby confirmed G 2-00174 C dates from December 15, 1969 ; that the quantity of ground water under the right hereby confirmed for the aforesaid purposes, is limited to an amount actually beneficially used for said purposes, and shall not exceed 500 gallons per minute; 168 acre-feet per year, during entire year for community domestic supply.

A description of the lands to which such ground water right is appurtenant is as follows:

The plats of Rushton-on-the-Bay; Rushlight Farm Estates; and South Addition to Ocean Park; ALL within Sec. 33, T. 12 N., R. 11 W.W.M.

The right to use of water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390 and 90.44.020.

This certificate of ground water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

Given under my hand and seal of this office at Olympia, Washington, this 17th day of August, 19 72.

JOHN A. BIGGS, Director
Department of Ecology

by

Engineering Data

OK

STATE OF WASHINGTON
Public Water System

Operating Permit

The Department of Health Division of Drinking Water issues a permit to operate
PACIFIC WATER COMPANY INC. (ID# 20051 V)

to owner: LEACH, PHILLIP C. COUNTY: PACIFIC

LEACH, PHILLIP C.
PO BOX 962

LONG BEACH WA 98631

This permit is valid through AUG 1, 1995

PERMIT CATEGORY: **** YELLOW ****

The permit category may be modified or the permit revoked subject to water system compliance with applicable State of Washington drinking water rules and regulations and the following statements:

OBTAIN WATER SYSTEM PLAN APPROVAL PER WAC 246-290-100
FIN VIABILITY PLAN APPROVAL PER WAC 246-290-100

NOTE: SYSTEM IS APPROVED FOR 279 SERVICE CONNECTIONS, WE SHOWS 60 ACTIVE RESIDENTIAL SERVICE CONNECTIONS

NOTE: WAC 246-294 requires water system plan approval and issuance of a new operating permit before transfer of ownership of a Public Water System.

DOH 331-030 (12/93) Front

DATE PRINTED: 01/19/95

Health
Environmental Health

WATER FACILITIES INVENTORY (W. .)

Read Instructions on back before completing

DATE UPDATED: 02/17/94

SYSTEM ID NO.	2. COUNTY	GROUP	TYPE	WRIA
70051V	PACIFIC	A	COMM	24

3. SYSTEM NAME: PACIFIC WATER COMPANY INC.

STREET ADDRESS:

P.O. BOX (IF APPLICABLE): P.O. BOX 982

CITY: LONG BEACH | STATE: WA | ZIP CODE: 98631

4. OWNER'S NAME (LAST, FIRST): LEACH, PHILLIP C. | OWNER NO.: 10183

STREET ADDRESS: PO BOX 982

P.O. BOX (IF APPLICABLE):

CITY: LONG BEACH | STATE: WA | ZIP CODE: 98631

5. SYSTEM CONTACT PERSON: PHILLIP C. LEACH - MANAGER | TITLE:

DAY TELEPHONE: 206-777-8786 | EVENING TELEPHONE: 206-777-8238

WFI COMPLETED BY: Phillip C Leach | TITLE: Pres.

DAY TELEPHONE: 360-777-8786 | DATE: 3-19-95

8. SUBMITTED FOR: [ ] NEW SYSTEM [ ] NO CHANGE [ ] REACTIVATE [ ] SYSTEM NAME CHANGE* [X] UPDATE [ ] DELETE

*OLD SYSTEM NAME - ENTER ONLY IF CHANGING WITH **THIS** WFI

SYSTEMS SERVING ANY RESIDENTS (PEOPLE LIVING IN A DWELLING SERVED BY THE SYSTEM), COMPLETE THIS SECTION

9. NUMBER ACTIVE RESIDENTIAL **CONNECTIONS**: ~~80~~ 80

10. NUMBER ACTIVE RESIDENTIAL **POPULATION**: ~~180~~ 200

SYSTEMS SERVING ANY NON-RESIDENTS (I.E., TRAVELERS, EMPLOYEES, STUDENTS, ETC.), COMPLETE THIS SECTION

11. NUMBER NON-RESIDENTIAL CONNECTIONS: 140

12. ENTER AVERAGE DAILY NON-RESIDENTIAL POPULATION SERVED FOR EACH MONTH. MAKE ENTRY FOR EACH MONTH

JAN	10	APR	10	JUL	150	OCT	10
FEB	10	MAY	25	AUG	150	NOV	10
MAR	10	JUN	150	SEP	10	DEC	10

13. DOES THE SYSTEM SERVE AT LEAST 25 OF THE SAME NON-RESIDENTS FOR 4 OR MORE DAYS PER WEEK FOR AT LEAST 180 DAYS PER YEAR?

[ ] YES [X] NO

14. TOTAL NUMBER CONNECTIONS METERED: ~~80~~ 182

15. DISTRIBUTION RESERVOIR(S) TOTAL CAPACITY: 2,000 GALLONS

6. OWNERSHIP (CHECK ONE ONLY)

- [ ] PRIVATE: NON-PROFIT
- [ ] PRIVATE: FOR-PROFIT
- [ ] LOCAL GOVERNMENT (COUNTY / CITY / PUD / WATER DISTRICT)
- [ ] STATE
- [ ] FEDERAL

7. PREDOMINANT CHARACTERISTIC (CHECK ONE ONLY)

- [X] RESIDENTIAL
- [ ] RECREATIONAL
- [ ] BUSINESS / INDUSTRIAL / AGRICULTURAL / COMMERCIAL
- [ ] LODGING / FOOD SERVICE
- [ ] SCHOOL / DAY CARE
- [ ] OTHER (CHURCHES, ETC.)

16. DOH SOURCE NUMBER	17. SOURCE NAME (LIST UTILITY'S NAME FOR SOURCE. IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S ID # AND NAME USING FOLLOWING FORMAT: XXXXXX / NAME EXAMPLE: 77050Y / SEATTLE)	18. SOURCE CATEGORY: WELL	WELL FIELD	SURFACE	SPRING	RANNEY / INF. GAL	INTERTIE	PURCHASE-TREATED	PURCHASE-UNTREATED	19. USE: PERMANENT	SEASONAL	EMERGENCY	20. SOURCE METERED	21. TREATMENT: NONE	CHLORINATION	FILTRATION	FLUORIDATION	OTHER	22. WELL DEPTH (FEET)	23. SOURCE CAPACITY (GPM)	24. SOURCE LOCATION: 1/4, 1/4 SEC.	SEC. NO.	TWP	RNG.	SWTR EVALUATION / VOC EVALUATION
501	WELL #1	X								X				X					56	140	SE/NE	33	12N	11W	
502	WELL #2	X								X				X					100	250	NW/NE	33	12N	11W	
503	WELL 3	X									X			X					100	80	SW/NE	33	00N		

MINIMUM REQUIRED BACTERIOLOGICAL SAMPLING SCHEDULE

25.	26.	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
		1	1	1	1	1	1	1	1	1	1	1	1

APPROVED SERVICES (PER PLANS): 279 | DATE OF LAST SANITARY SURVEY: 00 0000 | BY DOH [ ] | LHD [ ]

SYSTEM IN CRITICAL WATER SUPPLY SERVICE AREA? [X] YES [ ] NO | GW MGMT AREA? [ ] YES [ ] NO | FOR LHD USE ONLY

EFFECTIVE DATE RETRO. CHANGES | SIGNATURE OF DOH REVIEWER | DATE

WATER SYSTEM

DOH 331-011 (Rev. 5/92)

Please Print Plainly and Heavily

State of Washington
Department of Health
PUBLIC HEALTH LABORATORIES
1610 NE 150th Street, Seattle, WA 98155-9701 Tel. (206) 361-2898

WATER SAMPLE INFORMATION FOR INORGANIC CHEMICAL ANALYSES

DO NOT WRITE IN SHADED AREAS. PLEASE FILL BOXES NUMBERED 1 THRU 14. SEE BACK FOR INSTRUCTIONS

LABORATORY NUMBER: 511 5216

DATE RECEIVED: 3-15-95

1. DATE COLLECTED: 3-13-95

2. SYSTEM NAME: Pacific Water Comp Inc.

3. SYSTEM ID #: 20051V

4. CIRCLE GROUP: (A) B

5. COUNTY: Pacific

6. SOURCE TYPE:
☐ SURFACE ☒ WELL
☐ SPRING ☐ PURCHASE

7. SAMPLE TAKEN:
☒ BEFORE TREATMENT ☐ AFTER TREATMENT

8. SOURCE NO.: SO-2

9. SOURCE NAME: Broadway Pump

10. COLLECTED BY: Phi Leach
PHONE: 360 777-8786

11. IF TAKEN AFTER TREATMENT, CHECK TREATMENT:
☐ FLUORIDATION
☐ CHLORINATION
☐ FILTRATION
☐ WATER SOFTENER,
TYPE: _____
☐ OTHER: _____

12. IF TAKEN FROM DISTRIBUTION, INDICATE ADDRESS:
Pump House at Meter

13. PARTY TO PAY FOR TESTING:
SIGNATURE: Phillip C Leach
NAME: Phillip C Leach
ADDRESS: BOX 982
Long Beach WA.
98631
TELEPHONE: 360 777-8238

14. REMARKS: (water quality problems, address for extra copies, etc.)

LABORATORY REPORT
(DO NOT WRITE INSIDE THIS BOX)

TESTS		MCL[1]	LESS THAN <	RESULTS	UNITS	COMPLIANCE YES	COMPLIANCE NO	CHEMIST INITIALS
Antimony P	Sb	0.006	<	0.0002	mg/l	✓		CRW
Arsenic P	As	0.05		0.011	mg/l	✓		JDW
Barium P	Ba	2.0	<	0.10	mg/l	✓		PO/JDW
Beryllium P	Be	0.004	<	0.0003	mg/l	✓		PO/JDW
Cadmium P	Cd	0.005	<	0.001	mg/l	✓		JDW
Chromium P	Cr	0.1	<	0.010	mg/l	✓		PO/JDW
Copper P	Cu	~~*1.0~~ [2]	<	0.2	mg/l	✓		PO/JDW
Iron	Fe	0.3		0.19	mg/l	✓		PO/JDW
Lead P	Pb	~~*0.05~~ [2]	<	0.002	mg/l	✓		JDW
Manganese	Mn	0.05		0.054	mg/l	✓		PO/JDW
Mercury P	Hg	0.002	<	0.0005	mg/l	✓		KK
Nickel P	Ni	0.1	<	0.02	mg/l	✓		PO/JDW
Selenium P	Se	0.05	<	0.005	mg/l	✓		JDW
Silver	Ag	0.1	<	0.010	mg/l	✓		PO/JDW
Sodium P	Na			10	mg/l			PO/JDW
Thallium P	Tl	0.002	<	0.001	mg/l	✓		CRW
Zinc	Zn	5.0	<	0.2	mg/l	✓		PO/JDW
Hardness				27	mg/l as $CaCO_3$			PO/JDW
Conductivity		700		100	µmhos/cm 25° C	✓		✓
Turbidity P		1.0		0.5	NTU	✓		✓
Color		15.0		10.0	Color Units	✓		✓
Chloride	Cl	250		10	mg/l	✓		KK
Cyanide P	CN	0.2	<	0.005	mg/l	✓		JDW
Fluoride P	F	2.0	<	0.2	mg/l	✓		✓
Nitrate P	as N	10.0	<	0.2	mg/l	✓		KK
Nitrite P	as N	1.0	<	0.05	mg/l	✓		KK
Sulfate	SO_4	250			mg/l			
TDS		500			mg/l			

LABORATORY COMMENTS:
CN tested at Lavcks, Work order 95-03-590

NOT A BILL
Invoice to follow
CRW

CHARGE: ~~$95.00~~

LABORATORY SUPERVISOR: [signature]

DATE OF REPORT: 4-4-95

1 - MCL: Maximum Contamination Level. ~~This is the State MCL~~, Federal Action Levels are 0.015 mg/L for Lead and 1.3 mg/L for Copper; P - Primary Standard; TDS - Total Dissolved Solids

DOH 307-001 (7/94) Frame

WATER SUPPLIER COPY

Well #2
0-43 fine sand
43-76 sand and drift wood
76-100 fine sand
Drilled 20" diameter hole
casing 83' of 8" I.D.
Screen 15 ft #20 slot Johnson Stainless Steel
type 304 with std. fittings
Gravel 3/32 minus app. 35 yds
Static water level 8 ft. below surface tested
to 250 gpm at 85 ft. pumping level

BAY AVE
SO-2
A
33
34
8
HIGHWAY
103
25
30
19
HIGHWAY

Date entered 5/16/01 - DG

507

Ground Water Contamination
Susceptibility Assessment Survey Form
Version 2.2

IMPORTANT! Please complete one form for each ground water source (well, wellfield, spring) used in your water system. Photocopy as necessary.

PART I: System Information

Well owner/manager : Pete Christoson

Water system name : Ocean Park Water Company

County: Pacific

Water system number: 63000C Source number: S 07

Well depth: 136 (ft.) (*From WFI form*)

Source name: Well #6 Well Field S 06

WA well identification tag number: ___ ___ ___-___ ___ ___

_____ well not tagged

Number of connections: _____ Population served: _____

Township: 12N Range: 11

Section: 28 1/4 1/4 Section: ~~SW¼ of NE¼~~

Latitude/longitude (if available): _____/_____

How was lat./long. determined?

___ global positioning device ___ survey ___ topographic map
___ other: _____

* Please refer to Assistance Packet for details and explanations of all questions in Parts II through V.

PART II: Well Construction and Source Information

1) Date well originally constructed: 5 / 2 / 96 month/day/year

last reconstruction: ___ / ___ /___ month/day/year

_____ information unavailable

2) Well driller: Holt Drilling Inc.

10621 Todd Rd. E.

Puyallup, Washington 98372

___ well driller unknown

3) Type of well:

__Drilled: ___ rotary ___ bored X cable (percussion) ___ Dug

___ Other: ___ spring(s) ___ lateral collector (Ranney)

___ driven ___ jetted ___ other: _____

Additional comments: _____

_____

4) Well report available? X YES (attach copy to form) ___ NO

If no well log is available, please attach any other records documenting well construction; e.g. boring logs, "as built" sheets, engineering reports, well reconstruction logs.

5) Average pumping rate: 123 (gallons/min)

Source of information: Pump Test Data 04/09/96

If not documented, how was pumping rate determined? _____

_____

___ Pumping rate unknown

6) Is this source treated? ___ YES X NO

If so, what type of treatment:

___ disinfection ___ filtration ___ carbon filter ___ air stripper ___ other

Purpose of treatment (describe materials to be removed or controlled by treatment):

_____

_____

7) If source is chlorinated, is a chlorine residual maintained: ___ YES X NO

Residual level: _____ (*At the point closest to the source.*)

PART III: Hydrogeologic Information

1) Depth to top of open interval: [check one]

___ (less than) 20 ft ___ 20–50 ft ___ 50–100 ft X 100–200 ft ___ (greater than) 200 ft

___ information unavailable

2) Depth to ground water (static water level):

X (less than) 20 ft ___ 20–50 ft ___ 50–100 ft ___ (greater than) 100 ft

___ flowing well/spring (artesian)

How was water level determined?

___ well log X other: Pump Test Data 04/09/96

___ depth to ground water unknown

3) ~~If~~ source is a flowing well or spring, what is the confining pressure:

_____ psi (pounds per square inch)
or
_____ feet above wellhead

4) If source is a flowing well or spring, is there a surface impoundment, reservoir, or catchment associated with this source: ___ YES ___ NO

5) Wellhead elevation (height above mean sea level): _____ (ft)

How was elevation determined? ___ topographic map ___ Drilling/Well Log ___ altimeter

___ other: _____

X information unavailable

6) Confining layers: (This can be completed only for those sources with a drilling log, well log or geologic report describing subsurface conditions. Please refer to assistance package for example.)

___ evidence of a confining layer in well log

X no evidence of a confining layer in well log

If there is evidence of a confining layer, is the depth to ground water more than 20 feet above the **bottom** of the **lowest confining layer**? ___ YES ___ NO

___ information unavailable

7) Sanitary setback:

___ (less than) 100 ft* _X_ 100–120 ft ___ 120–200 ft ___ (greater than) 200 ft
* if less than 100 ft describe the site conditions:

_____

_____

_____

_____

8) Wellhead construction:

_X_ wellhead enclosed in a wellhouse

_X_ controlled access (describe): _____

_____

___ other uses for wellhouse (describe): _____

_____

___ no wellhead control

9) Surface seal:

___ 18 ft

___ (less than) 18 ft (no Department of Ecology approval)

___ (less than) 18 ft (Approved by Ecology, include documentation)

_X_ (greater than) 18 ft

___ depth of seal unknown

___ no surface seal

10) Annual rainfall (inches per year):

___ (less than) 10 in/yr ___ 10–25 in/yr _X_ (greater than) 25 in/yr

PART IV: Mapping Your Ground Water Resource

1) Annual volume of water pumped: 78,310 (gallons)

How was this determined?

X meter

___ estimated: ___ pumping rate (100)

___ pump capacity (123)

___ other: _____

2) "Calculated Fixed Radius" estimate of ground water movement:
(see Instruction Packet)

6 month ground water travel time : 140 (ft)

1 year ground water travel time : 200 (ft)

5 year ground water travel time: 440 (ft)

10 year ground water travel time: 620 (ft)

Information available on length of screened/open interval?

X YES ___ NO

Length of screened/open interval: 20 (ft)

3) Is there a river, lake, pond, stream, or other obvious surface water body within the 6 month time of travel boundary? ___ YES X NO (mark and identify on map).

4) Is there a stormwater and/or wastewater facility, treatment lagoon, or holding pond located within the 6 month time of travel boundary? ___ YES X NO (mark and identify on map).

Comments: _____

_____

_____

_____

_____

PART V: Assessment of Water Quality

1) Regional sources of risk to ground water:

Please indicate if any of the following are present within a circular area around your water source having a radius up to and including the five year ground water travel time:

	6 month	1 year	5 year	unknown
likely pesticide application	____	____	____	____
stormwater injection wells	____	____	____	____
other injection wells	____	____	____	____
abandoned ground water well	____	____	____	____
landfills, dumps, disposal areas	____	____	____	____
known hazardous materials clean-up site	____	____	____	____
water system(s) with known quality problems	____	____	____	____
population density (greater than) 1 house/acre	____	X	X	____
residences commonly have septic tanks	____	X	X	____
Wastewater treatment lagoons	____	____	____	____
sites used for land application of waste	____	____	____	____

Mark and identify on map any of the risks listed above which are located within the 6 month time of travel boundary? (*Please include a map of the wellhead and time of travel areas with this form. Please locate and mark any of the following.*)

If other recorded or potential sources of ground water contamination exist within the ten year time of travel circular zone around your water supply, please describe:

Population density 1 House per/ ac.

Residence commonly have septic tanks

2) Source specific water quality records:

Please indicate the occurrence of any test results since 1986 that meet the following conditions: (Unless listed on assessment, MCLs are listed in assistance package.)

A. Nitrate: (Nitrate MCL = 10 mg/l)	YES
Results greater than MCL	____
(less than) 2 mg/liter nitrate	X
2-5 mg/liter nitrate	____
(greater than) 5 mg/liter nitrate	____
Nitrate sampling records unavailable	____

B. VOCs: (VOC detection level 0.5 ug/l or 0.0005 mg/l.)	YES
Results greater than MCL or SAL	____
VOCs detected at least once	____
VOC test performed but never detected	____
VOC sampling records unavailable	____

C. EDB/DBCP:	YES
(EDB MCL = 0.05 ug/l or 0.00005 mg/l. DBCP MCL = 0.2 ug/l or 0.0002 mg/l.)	
EDB/DBCP detected below MCL at least once	____
EDB/DBCP detected above MCL at least once	____
EDB/DBCP never detected	____
EDB/DBCP tests required but not yet completed	____
EDB/DBCP tests not required	X

D. Other SOCs (pesticides and other synthetic organic chemicals):	YES
Other SOCs detected	____
Other SOC tests performed but none detected *	____
Other SOC tests not performed	____

*If any SOCs in addition to EDB/DBCP were detected, please identify and date. If other SOC tests were performed, but no SOCs detected, list test methods here: _____

_____

_____

_____

E. Bacterial contamination: YES

Any bacterial detection(s) in the past 3 years in samples taken from the source (not distribution sampling records). ____

Has source (in past 3 years) had a bacteriological contamination problem found in distribution samples that was attributed to the source. ____

Source sampling records for bacteria unavailable ____

Part VI: Geographic or Hydrologic Factors Contributing to a Non-Circular Zone of Contribution

The following questions will help identify those ground water systems which may not be accurately represented by the calculated fixed radius (CFR) method described in Part IV. For these sources, the CFR areas should be used as a preliminary delineation of the critical time of travel zones for that source. As a system develops its Wellhead Protection Plan for theses sources, a more detailed delineation method should be considered.

1)Is there evidence of obvious hydrologic boundaries within the 10 year time of travel zone of the CFR? (Does the largest circle extend over a stream, river, lake, up a steep hillside, and/or over a mountain or ridge?)

__ YES X NO

Describe with references to map produced in Part IV:

_____

_____

2) Aquifer Material:

A) Does the drilling log, well log or other geologic/engineering reports identify that the well is located in an area where the underground conditions are identified as fractured rock and/or basalt terrain?

__ YES X NO

B) Does the drilling log, well log or other geologic/engineering reports indicate that the well is located in an area where the underground conditions are primarily identified as coarse sand and gravel?

__ YES X NO

3) Is the source located in an aquifer with a high horizontal flow rate? (These can include sources located on flood plains of large rivers, artesian wells with high water pressure, and/or shallow flowing wells and springs.)

__ YES X NO

4) Are there other high capacity wells (agricultural, municipal and/or industrial) located within the CFRs?

a) Presence of ground water extraction wells removing more than approximately 500 gal/min within...

	YES	NO	unknown
6 month travel time	__	X	__
6 month–1 year travel time	__	X	__
1–5 year travel time	__	X	__
5–10 year travel time	__	X	__

b) Presence of ground water recharge wells (dry wells) or heavy irrigation within...

	YES	NO	unknown
1 year travel time	__	X	__
1–5 year travel time	__	X	__
5–10 year travel time	__	X	__

Please identify or describe additional hydrologic or geographic conditions that you believe may affect the shape of the zone of contribution for this source. Where possible, reference them to locations on the map produced in Part IV.

Suggestions and Comments

Did you attend one of the susceptibility workshops? ___ YES ___ NO

Did you find it useful? ___ YES ___ NO

Did you seek outside assistance to complete the assessment? ___ YES ___ NO

This form and instruction packet are still in the process of development. Your comments, suggestions and questions will help us upgrade and improve this assessment form. If you found particular sections confusing or problematic please let us know. How could this susceptibility assessment be improved or made clearer? Did the instruction package help you find the information needed to complete the assessment? How much time did it take you to complete the form? Were you able to complete the assessment without additional/outside expertise? Do you feel the assessment was valuable as a learning experience? Any other comments or constructive criticisms you have would be appreciated.

OCEAN PARK WATER CO., INC.
P.O. BOX 618
1407 263 PLACE
OCEAN PARK, WASHINGTON 98640
PHONE: (360) 665-4144

PUMP TEST DATA

DATE April 9, 1996

TESTED BY Pete

TIME	G.P.M.	DEPTH TO WATER LEVEL	DRAWDOWN
0	0	11' 10"	0
1 min	123	26' 0"	14' 2"
5 min	123	29' 5"	17' 7"
30 min	123	29' 9"	17' 11"
1 Hr	123	29' 8"	17' 10"
2 Hr	123	29' 9"	17' 11"
3 Hr	123	29' 9"	17' 11"
4 Hr	123	29' 9"	17' 11"

SYSTEM NAME	Ocean Park Water Co.
SOURCE	Deep Well
LOCATION	well #6
STATIC LEVEL	11' 10"
PUMP	Jacuzzi
MODEL	75S675-8
OUTLET DIA.	2½"
MOTOR	Franklin 230 V 3ø
H. P.	7.5 hp

RECOVERY

1 min	13' 0"
5 min	12' 4"
30 min	12' 1"
1 Hr	11' 10"
2 Hr	11' 10"
3 Hr	11' 10"

REMARKS:

TOTAL GALLONS PUMPED	29,520
TOTAL PUMP TIME	4 Hrs.
AVERAGE G.P.M.	123 gpm

IV-16

EXHIBIT IV-1

EXHIBIT IV-3 WELL #6

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

507 DOE #6
Start Card No. 16437
UNIQUE WELL I.D. # 228
Water Right Permit No. G2-21399

(1) OWNER: Name Ocean Park Water Address PO Box 618 Ocean Park WA 98640

(2) LOCATION OF WELL: County Pacific NE 1/4 NE 1/4 Sec 6 T. 12 N., R 11

(2a) STREET ADDRESS OF WELL (or nearest address)

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☒ ☐ Irrigation ☐ Test Well ☐ Other ☐ ☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) DOE #6
Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8" inches.
Drilled 130 feet. Depth of completed well 130 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 8" Diam. from +2 ft. to 107 ft.
Welded ☐
Liner installed ☐ " Diam. from ft. to ft.
Threaded ☐ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☐
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☒ No ☐
Manufacturer's Name Johnson
Type Model No.
Diam. 7" Slot size 10 from 107 ft. to 117 ft.
Diam. 7" Slot size 8 from 127 ft. to 117 ft.

Gravel packed: Yes ☐ No ☐ Size of gravel
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20' ft.
Material used in seal Bentonite Chips
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land surface elevation above mean sea level ft.
Static level 8' ft. below top of well Date 7-4-96
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 45 gal./min. with 2' ft. drawdown after 1 hrs.
Airtest gal./min. with stem set at ft. for hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Brown Sand	0	56
Gray Sand & Wood	56	130

COPY

507

Work Started 2-28 19 96 Completed 5-4 19 96

WELL CONSTRUCTOR CERTIFICATION:

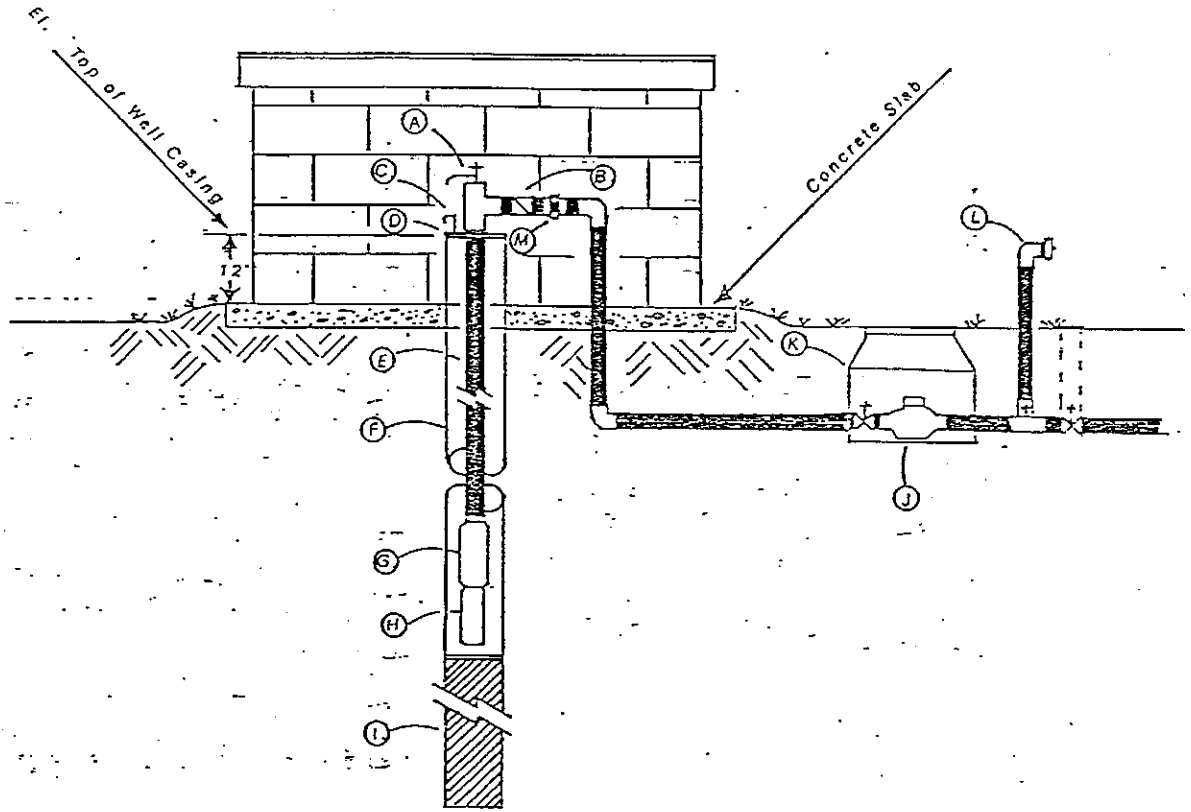
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Holt Drilling Inc (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address 10621 Todd Rd E Puyallup WA 98
(Signed) (WELL DRILLER) License No. 577
Contractor's Registration No. HOLTDI*17606 Date 5-2 19 96

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

ECY 050-1-20 (9/93)

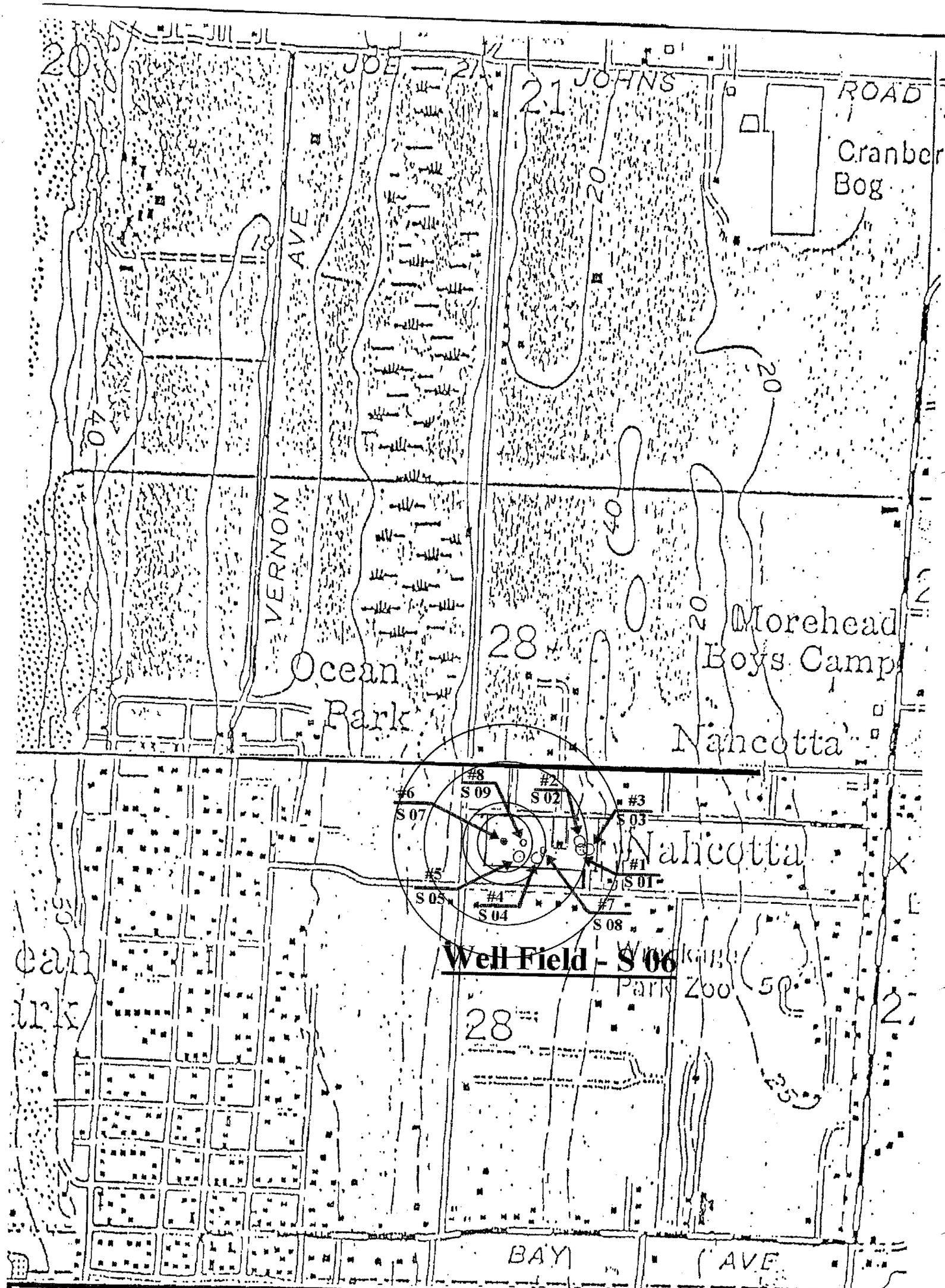


A	Raw Water Sample Tap
B	Swing Check Valve
C	Screened Air Vent / Access Port
D	Well Seal
E	Galvanized Iron Pipe Pump Column
F	Steel Well Casing
G	Jacuzzi Submersible Pump
H	Franklin Motor 230 v. / 3 ph.
I	20' Stainless Steel Well Screen
J	Water Metering Device
K	Meter Vault
L	B/Off Stand Pipe
M	Galvanized Ground Joint Union

TYPICAL:

Deep Well with Submersible Pump, Plumbing and Appurtenance

OCEAN PARK WATER CO.



Project: Susceptibilty: #6/SO7 **Date:** **Scale 1" = 500 feet** **Drawing by:** *Phillip C Leach* **Approved by:**	**Ocean Park Water Co., Inc.** P.O. Box 618 25902 Vernon Avenue, Suite C Ocean Park, WA 98640 Phone: (360) 665-4144	O Well # S 01 is #1 O Well # S 02 is #2 O Well # S 03 is #3 O Well # S 04 is #4 O Well # S 05 is #5 ◉ Well # S 07 is #6 O Well # S 08 is #7 O Well # S 09 is #8

Data entered 5/16/01 - DG

Ground Water Contamination
Susceptibility Assessment Survey Form
Version 2.2

IMPORTANT! Please complete one form for each ground water source (well, wellfield, spring) used in your water system. Photocopy as necessary.

PART I: System Information

Well owner/manager : Pete Christoson

Water system name : Ocean Park Water Co.

County: Pacific

Water system number: 63000C Source number: S 08

Well depth: 120' (ft.) (*From WFI form*)

Source name: Well #7 Well Field S 06

WA well identification tag number:___ ___ ___-___ ___ ___

_____ well not tagged

Number of connections: _____ Population served: _____

Township: 12 N Range: 11

Section: 28 1/4 1/4 Section: SW¼ of NE¼

Latitude/longitude (if available): _____/_____

How was lat./long. determined?

____ global positioning device ____ survey ____ topographic map
____ other: _____

* Please refer to Assistance Packet for details and explanations of all questions in Parts II through V.

PART II: Well Construction and Source Information

1) Date well originally constructed: 11 / 6 / 78 month/day/year

last reconstruction: ___ / ___ /___ month/day/year

_____ information unavailable

2) Well driller: Pete Smith Well Drilling

St Rt 32

Cosmopolis, Washington 98537

___ well driller unknown

3) Type of well:

__Drilled: ___ rotary ___ bored X cable (percussion) ___ **Dug**

___ **Other:** ___ spring(s) ___ lateral collector (Ranney)

___ driven ___ jetted ___ other: _____

Additional comments: _____

_____

4) Well report available? X YES (attach copy to form) ___ NO

If no well log is available, please attach any other records documenting well construction; e.g. boring logs, "as built" sheets, engineering reports, well reconstruction logs.

5) Average pumping rate: 100 (gallons/min)

Source of information: Pump Test Data 10/10/96

If not documented, how was pumping rate determined? _____

_____

___ Pumping rate unknown

6) Is this source treated? ___ YES X NO

If so, what type of treatment:

___ disinfection ___ filtration ___ carbon filter ___ air stripper ___ other

Purpose of treatment (describe materials to be removed or controlled by treatment):

_____

_____

7) If source is chlorinated, is a chlorine residual maintained: ___ YES X NO

Residual level: _____ (*At the point closest to the source.*)

PART III: Hydrogeologic Information

1) Depth to top of open interval: [check one]

___ (less than) 20 ft ___ 20-50 ft ___ 50-100 ft _X_ 100-200 ft ___ (greater than) 200 ft

___ information unavailable

2) Depth to ground water (static water level):

_X_ (less than) 20 ft ___ 20-50 ft ___ 50-100 ft ___ (greater than) 100 ft

___ flowing well/spring (artesian)

How was water level determined?

___ well log _X_ other: Pump Test Data 10/10/96

___ depth to ground water unknown

3) If source is a flowing well or spring, what is the confining pressure:

_____ psi (pounds per square inch)
or
_____ feet above wellhead

4) If source is a flowing well or spring, is there a surface impoundment, reservoir, or catchment associated with this source: ___ YES ___ NO

5) Wellhead elevation (height above mean sea level): _____ (ft)

How was elevation determined? ___ topographic map ___ Drilling/Well Log ___ altimeter

___ other: _____

_X_ information unavailable

6) Confining layers: (This can be completed only for those sources with a drilling log, well log or geologic report describing subsurface conditions. Please refer to assistance package for example.)

___ evidence of a confining layer in well log

_X_ no evidence of a confining layer in well log

If there is evidence of a confining layer, is the depth to ground water more than 20 feet above the **bottom** of the **lowest confining layer**? ___ YES ___ NO

___ information unavailable

7) Sanitary setback:

___ (less than) 100 ft* ___ 100–120 ft X 120–200 ft ___ (greater than) 200 ft
* if less than 100 ft describe the site conditions:

_____

_____

_____

_____

8) Wellhead construction:

X wellhead enclosed in a wellhouse

X controlled access (describe): Lock on Well house

_____

___ other uses for wellhouse (describe): None

_____

___ no wellhead control

9) Surface seal:

X 18 ft

___ (less than) 18 ft (no Department of Ecology approval)

___ (less than) 18 ft (Approved by Ecology, include documentation)

___ (greater than) 18 ft

___ depth of seal unknown

___ no surface seal

10) Annual rainfall (inches per year):

___ (less than) 10 in/yr ___ 10–25 in/yr X (greater than) 25 in/yr

PART IV: Mapping Your Ground Water Resource

1) Annual volume of water pumped: 4,618,236 (gallons)

How was this determined?

X meter

___ estimated: X pumping rate (100.5 gpm)

___ pump capacity (_____)

___ other: _____

2) "Calculated Fixed Radius" estimate of ground water movement:
(see Instruction Packet)

6 month ground water travel time : 140 (ft)

1 year ground water travel time : 200 (ft)

5 year ground water travel time: 440 (ft)

10 year ground water travel time: 620 (ft)

Information available on length of screened/open interval?

X YES ___ NO

Length of screened/open interval: 20' (ft)

3) Is there a river, lake, pond, stream, or other obvious surface water body within the 6 month time of travel boundary? ___ YES X NO (mark and identify on map).

4) Is there a stormwater and/or wastewater facility, treatment lagoon, or holding pond located within the 6 month time of travel boundary? ___ YES X NO (mark and identify on map).

Comments: _____

_____

_____

_____

_____

PART V: Assessment of Water Quality

1) Regional sources of risk to ground water:

Please indicate if any of the following are present within a circular area around your water source having a radius up to and including the five year ground water travel time:

	6 month	1 year	5 year	unknown
likely pesticide application	____	____	____	____
stormwater injection wells	____	____	____	____
other injection wells	____	____	____	____
abandoned ground water well	____	____	____	____
landfills, dumps, disposal areas	____	____	____	____
known hazardous materials clean-up site	____	____	____	____
water system(s) with known quality problems	____	____	____	____
population density (greater than) 1 house/acre	____	X	X	____
residences commonly have septic tanks	____	X	X	____
Wastewater treatment lagoons	____	____	____	____
sites used for land application of waste	____	____	____	____

Mark and identify on map any of the risks listed above which are located within the 6 month time of travel boundary? (*Please include a map of the wellhead and time of travel areas with this form. Please locate and mark any of the following.*)

If other recorded or potential sources of ground water contamination exist within the ten year time of travel circular zone around your water supply, please describe:

Population Density 1 house Per/Ac.

Residence commonly have septic tanks

2) Source specific water quality records:

Please indicate the occurrence of any test results since 1986 that meet the following conditions: (Unless listed on assessment, MCLs are listed in assistance package.)

A. Nitrate: (Nitrate MCL = 10 mg/l)	YES
Results greater than MCL	___
(less than) 2 mg/liter nitrate	X
2-5 mg/liter nitrate	___
(greater than) 5 mg/liter nitrate	___
Nitrate sampling records unavailable	___

B. VOCs: (VOC detection level 0.5 ug/l or 0.0005 mg/l.)	YES
Results greater than MCL or SAL	___
VOCs detected at least once	___
VOC test performed but never detected	___
VOC sampling records unavailable	___

C. EDB/DBCP:	YES
(EDB MCL = 0.05 ug/l or 0.00005 mg/l. DBCP MCL = 0.2 ug/l or 0.0002 mg/l.)	
EDB/DBCP detected below MCL at least once	___
EDB/DBCP detected above MCL at least once	___
EDB/DBCP never detected	___
EDB/DBCP tests required but not yet completed	___
EDB/DBCP tests not required	X

D. Other SOCs (pesticides and other synthetic organic chemicals):	YES
Other SOCs detected	___
Other SOC tests performed but none detected *	___
Other SOC tests not performed	___

*If any SOCs in addition to EDB/DBCP were detected, please identify and date. If other SOC tests were performed, but no SOCs detected, list test methods here: _____

_____

_____

_____

E. Bacterial contamination: YES

Any bacterial detection(s) in the past 3 years in samples taken from the source (not distribution sampling records). ____

Has source (in past 3 years) had a bacteriological contamination problem found in distribution samples that was attributed to the source. ____

Source sampling records for bacteria unavailable ____

Part VI: Geographic or Hydrologic Factors Contributing to a Non-Circular Zone of Contribution

The following questions will help identify those ground water systems which may not be accurately represented by the calculated fixed radius (CFR) method described in Part IV. For these sources, the CFR areas should be used as a preliminary delineation of the critical time of travel zones for that source. As a system develops its Wellhead Protection Plan for theses sources, a more detailed delineation method should be considered.

1)Is there evidence of obvious hydrologic boundaries within the 10 year time of travel zone of the CFR? (Does the largest circle extend over a stream, river, lake, up a steep hillside, and/or over a mountain or ridge?)

___ YES X NO

Describe with references to map produced in Part IV:

_____

_____

2) Aquifer Material:

A) Does the drilling log, well log or other geologic/engineering reports identify that the well is located in an area where the underground conditions are identified as fractured rock and/or basalt terrain?

___ YES X NO

B) Does the drilling log, well log or other geologic/engineering reports indicate that the well is located in an area where the underground conditions are primarily identified as coarse sand and gravel?

___ YES X NO

3) Is the source located in an aquifer with a high horizontal flow rate? (These can include sources located on flood plains of large rivers, artesian wells with high water pressure, and/or shallow flowing wells and springs.)

__ YES X NO

4) Are there other high capacity wells (agricultural, municipal and/or industrial) located within the CFRs?

a) Presence of ground water extraction wells removing more than approximately 500 gal/min within...

	YES	NO	unknown
6 month travel time	__	X	__
6 month–1 year travel time	__	X	__
1–5 year travel time	__	X	__
5–10 year travel time	__	X	__

b) Presence of ground water recharge wells (dry wells) or heavy irrigation within...

	YES	NO	unknown
1 year travel time	__	X	__
1–5 year travel time	__	X	__
5–10 year travel time	__	X	__

Please identify or describe additional hydrologic or geographic conditions that you believe may affect the shape of the zone of contribution for this source. Where possible, reference them to locations on the map produced in Part IV.

Suggestions and Comments

Did you attend one of the susceptibility workshops? ___ YES ___ NO

Did you find it useful? ___ YES ___ NO

Did you seek outside assistance to complete the assessment? ___ YES ___ NO

This form and instruction packet are still in the process of development. Your comments, suggestions and questions will help us upgrade and improve this assessment form. If you found particular sections confusing or problematic please let us know. How could this susceptibility assessment be improved or made clearer? Did the instruction package help you find the information needed to complete the assessment? How much time did it take you to complete the form? Were you able to complete the assessment without additional/outside expertise? Do you feel the assessment was valuable as a learning experience? Any other comments or constructive criticisms you have would be appreciated.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

EXHIBIT IV-3
WATER WELL REPORT
STATE OF WASHINGTON

DOE #7
Application No. .....
Permit No. G2-00759

(1) OWNER: Name ..... Address Ocean Park

(2) LOCATION OF WELL: County Pacific NE ¼ ¼ Sec. 2 T. 15 N., R. W.M.
Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) .... DOE #7
New well ☐ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 120 ft. Depth of completed well 120 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Diam. from ... ft. to 120 ft.
Threaded ☐ ..... " Diam. from ... ft. to ... ft.
Welded ☐ ..... " Diam. from ... ft. to ... ft.

Perforations: Yes ☐ No ☐
Type of perforator used .....
SIZE of perforations ..... in. by ..... in.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

Screens: Yes ☐ No ☐
Manufacturer's Name Johnson
Type ..... Model No. .....
Diam. 5 Slot size 8 from 100 ft. to 120 ft.
Diam. ..... Slot size ..... from ..... ft. to ..... ft.

Gravel packed: Yes ☐ No ☐ Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

Surface seal: Yes ☐ No ☐ To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? ..... Depth of strata .....
Method of sealing strata off .....

(7) PUMP: Manufacturer's Name .....
Type: ..... H.P. .....

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 12 ft. below top of well Date .....
Artesian pressure ..... lbs. per square inch Date .....
Artesian water is controlled by ..... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? .....
Yield: ..... gal./min. with ..... ft. drawdown after ..... hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test .....
Bailer test 30 gal./min. with 8 ft. drawdown after 1 hrs.
Artesian flow ..... g.p.m. Date .....
Temperature of water ..... Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Sand Brown fine	0	72
Sand Grey coarse	72	120

Ocean Park

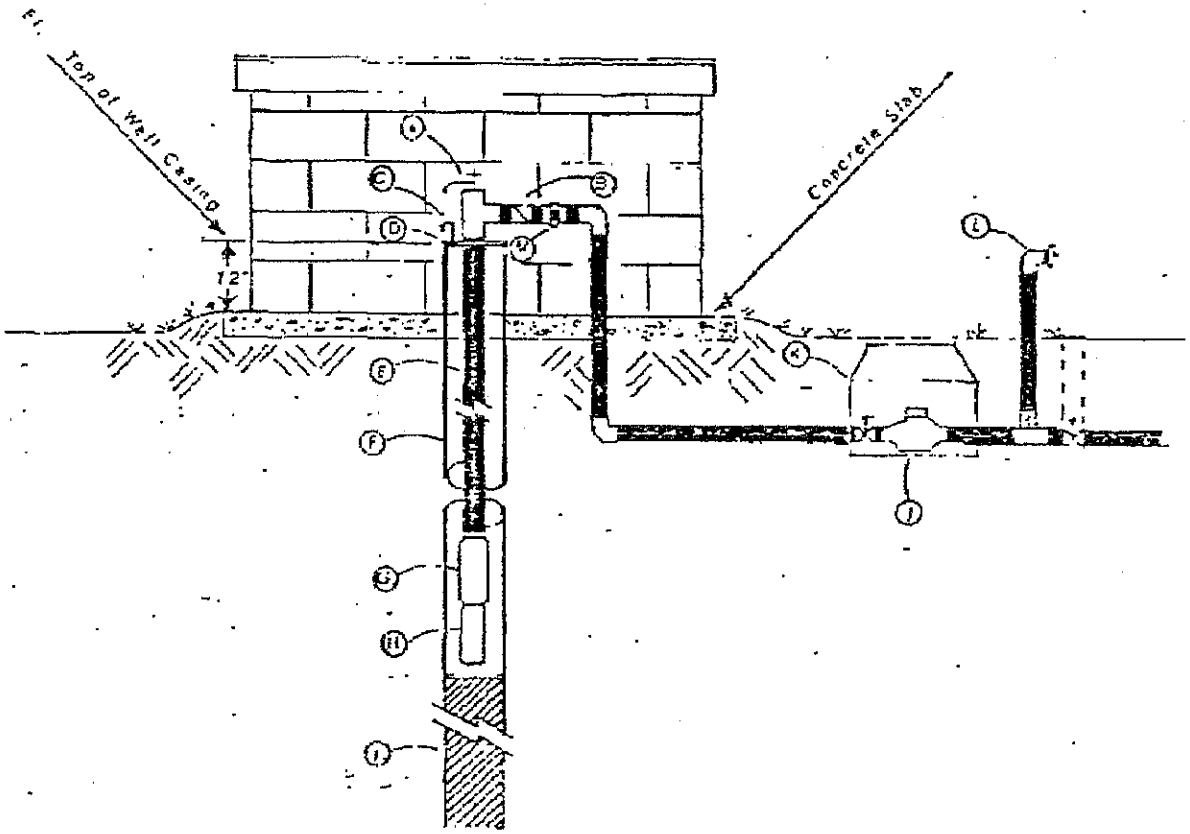
SDS

Work started ..... 19..... Completed ..... 19.....

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME ..... (Person, firm, or corporation) (Type or print)
Address .....
[Signed] ..... (Well Driller)
License No. ..... Date ..... 19.....

ECY 050-1-20

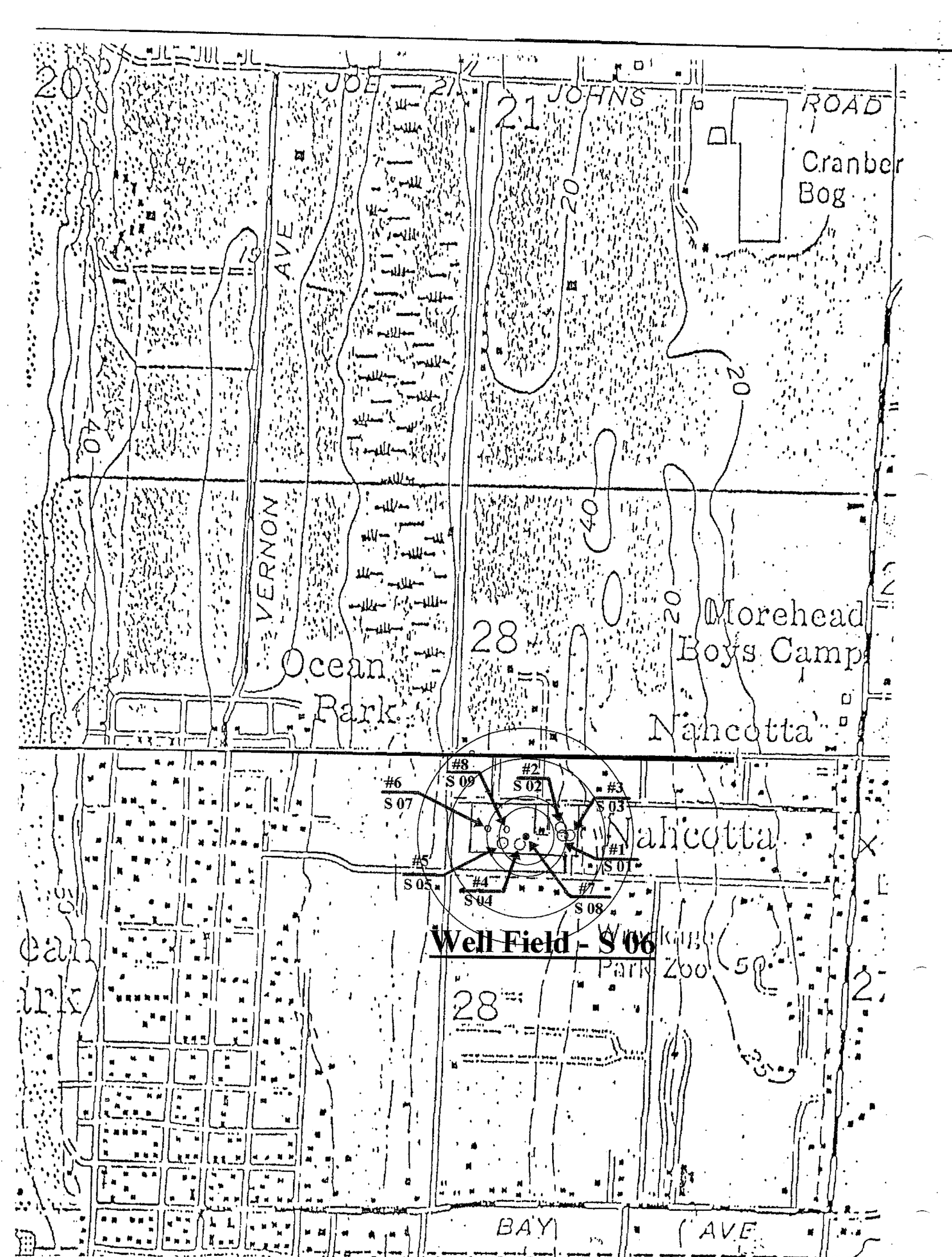


A	Raw Water Sample Tap
B	Swing Check Valve
C	Screened Air Vent / Access Port
D	Well Seal
E	Galvanized Iron Pipe Pump Column
F	Steel Well Casing
G	Jacuzzi Submersible Pump
H	Franklin Motor 230 v. / 3 ph.
I	20' Stainless Steel Well Screen
J	Water Metering Device
K	Meter Vault
L	B Off Stand Pipe
M	Galvanized Ground Joint Union

TYPICAL:

Deep Well with Submersible Pump, Plumbing and Appurtenance

OCEAN PARK WATER CO.



Project: Susceptibility: #7/SO8

Date:

Scale 1" = 500 feet

Drawing by: *Phillip C Leach*

Approved by:

Ocean Park Water Co., Inc.
P.O. Box 618
25902 Vernon Avenue, Suite C
Ocean Park, WA 98640
Phone: (360) 665-4144

- O Well # S 01 is #1
- O Well # S 02 is #2
- O Well # S 03 is #3
- O Well # S 04 is #4
- O Well # S 05 is #5
- O Well # S 07 is #6
- ◉ Well # S 08 is #7
- O Well # S 09 is #8

N
W E
S

Data entered 5/16/01 -DG

Ground Water Contamination
Susceptibility Assessment Survey Form
Version 2.2

IMPORTANT! Please complete one form for each ground water source (well, wellfield, spring) used in your water system. Photocopy as necessary.

PART I: System Information

Well owner/manager : Pete Christoson

Water system name : Ocean Park Water Company

County: Pacific

Water system number: 63000C Source number: S 0 9

Well depth: 136 (ft.) (*From WFI form*)

Source name: Well #8 Well Field S 06

WA well identification tag number:___ ___ ___-___ ___ ___

_____ well not tagged

Number of connections: _____ Population served: _____

Township: 12 N Range: 11

Section: 28 1/4 1/4 Section: SW¼ of NE¼

Latitude/longitude (if available): _____/_____

How was lat./long. determined?

____ global positioning device ____ survey ____ topographic map
____ other: _____

* Please refer to Assistance Packet for details and explanations of all questions in Parts II through V.

PART II: Well Construction and Source Information

1) Date well originally constructed: 05 / 03 / 96 month/day/year

last reconstruction: ___ / ___ /___ month/day/year

_____ information unavailable

2) Well driller: Holt Drilling Inc.

10621 Todd Rd. E.

Puyallup, Washington 98372

___ well driller unknown

3) Type of well:

___Drilled: ___ rotary ___ bored X cable (percussion) ___ Dug

___ Other: ___ spring(s) ___ lateral collector (Ranney)

___ driven ___ jetted ___ other: _____

Additional comments: _____

4) Well report available? X YES (attach copy to form) ___ NO

If no well log is available, please attach any other records documenting well construction; e.g. boring logs, "as built" sheets, engineering reports, well reconstruction logs.

5) Average pumping rate: 123 (gallons/min)

Source of information: Pump Test Data 04/09/96

If not documented, how was pumping rate determined? _____

___ Pumping rate unknown

6) Is this source treated? ___ YES X NO

If so, what type of treatment:

___ disinfection ___ filtration ___ carbon filter ___ air stripper ___ other

Purpose of treatment (describe materials to be removed or controlled by treatment):

7) If source is chlorinated, is a chlorine residual maintained: ___ YES X NO

Residual level: _____ (*At the point closest to the source.*)

PART III: Hydrogeologic Information

1) Depth to top of open interval: [check one]

___ (less than) 20 ft ___ 20-50 ft ___ 50-100 ft _X_ 100-200 ft ___ (greater than) 200 ft

___ information unavailable

2) Depth to ground water (static water level):

_X_ (less than) 20 ft ___ 20-50 ft ___ 50-100 ft ___ (greater than) 100 ft

___ flowing well/spring (artesian)

How was water level determined?

___ well log ___ other: _____

___ depth to ground water unknown

3) If source is a flowing well or spring, what is the confining pressure:

_____ psi (pounds per square inch)
or
_____ feet above wellhead

4) If source is a flowing well or spring, is there a surface impoundment, reservoir, or catchment associated with this source: ___ YES ___ NO

5) Wellhead elevation (height above mean sea level): _____ (ft)

How was elevation determined? ___ topographic map ___ Drilling/Well Log ___ altimeter

___ other: _____

_X_ information unavailable

6) Confining layers: (This can be completed only for those sources with a drilling log, well log or geologic report describing subsurface conditions. Please refer to assistance package for example.)

___ evidence of a confining layer in well log

_X_ no evidence of a confining layer in well log

If there is evidence of a confining layer, is the depth to ground water more than 20 feet above the **bottom** of the **lowest confining layer**? ___ YES ___ NO

___ information unavailable

7) Sanitary setback:

___ (less than) 100 ft* ___ 100–120 ft X 120–200 ft ___ (greater than) 200 ft
* if less than 100 ft describe the site conditions:

_____

_____

_____

_____

8) Wellhead construction:

X wellhead enclosed in a wellhouse

X controlled access (describe): Lock on well house door

_____

___ other uses for wellhouse (describe): None

_____

___ no wellhead control

9) Surface seal:

___ 18 ft

___ (less than) 18 ft (no Department of Ecology approval)

___ (less than) 18 ft (Approved by Ecology, include documentation)

X (greater than) 18 ft

___ depth of seal unknown

___ no surface seal

10) Annual rainfall (inches per year):

___ (less than) 10 in/yr ___ 10–25 in/yr X (greater than) 25 in/yr

PART IV: Mapping Your Ground Water Resource

1) Annual volume of water pumped: 44,437,360 (gallons)

How was this determined?

X meter

___ estimated: ___ pumping rate (100)

___ pump capacity (123)

___ other: _____

2) "Calculated Fixed Radius" estimate of ground water movement:
(see Instruction Packet)

6 month ground water travel time : 440 (ft)

1 year ground water travel time : 620 (ft)

5 year ground water travel time: 1,390 (ft)

10 year ground water travel time: 1,970 (ft)

Information available on length of screened/open interval?

X YES ___ NO

Length of screened/open interval: 20' (ft)

3) Is there a river, lake, pond, stream, or other obvious surface water body within the 6 month time of travel boundary? ___ YES X NO (mark and identify on map).

4) Is there a stormwater and/or wastewater facility, treatment lagoon, or holding pond located within the 6 month time of travel boundary? ___ YES X NO (mark and identify on map).

Comments: _____

_____

_____

_____

_____

PART V: Assessment of Water Quality

1) Regional sources of risk to ground water:

Please indicate if any of the following are present within a circular area around your water source having a radius up to and including the five year ground water travel time:

	6 month	1 year	5 year	unknown
likely pesticide application	____	____	____	____
stormwater injection wells	____	____	____	____
other injection wells	____	____	____	____
abandoned ground water well	____	____	____	____
landfills, dumps, disposal areas	____	____	____	____
known hazardous materials clean-up site	____	____	____	____
water system(s) with known quality problems	____	____	____	____
population density (greater than) 1 house/acre	____	X	X	____
residences commonly have septic tanks	____	X	X	____
Wastewater treatment lagoons	____	____	____	____
sites used for land application of waste	____	____	____	____

Mark and identify on map any of the risks listed above which are located within the 6 month time of travel boundary? (*Please include a map of the wellhead and time of travel areas with this form. Please locate and mark any of the following.*)

If other recorded or potential sources of ground water contamination exist within the ten year time of travel circular zone around your water supply, please describe:

Population density 1 House per/ac.

Residence commonly have septic tanks

2) Source specific water quality records:

Please indicate the occurrence of any test results since 1986 that meet the following conditions: (Unless listed on assessment, MCLs are listed in assistance package.)

A. Nitrate: (Nitrate MCL = 10 mg/l)	YES
Results greater than MCL	____
(less than) 2 mg/liter nitrate	X
2-5 mg/liter nitrate	____
(greater than) 5 mg/liter nitrate	____
Nitrate sampling records unavailable	____

B. VOCs: (VOC detection level 0.5 ug/l or 0.0005 mg/l.)	YES
Results greater than MCL or SAL	____
VOCs detected at least once	____
VOC test performed but never detected	____
VOC sampling records unavailable	____

C. EDB/DBCP:	YES
(EDB MCL = 0.05 ug/l or 0.00005 mg/l. DBCP MCL = 0.2 ug/l or 0.0002 mg/l.)	
EDB/DBCP detected below MCL at least once	____
EDB/DBCP detected above MCL at least once	____
EDB/DBCP never detected	____
EDB/DBCP tests required but not yet completed	____
EDB/DBCP tests not required	X

D. Other SOCs (pesticides and other synthetic organic chemicals):	YES
Other SOCs detected	____
Other SOC tests performed but none detected *	____
Other SOC tests not performed	____

*If any SOCs in addition to EDB/DBCP were detected, please identify and date. If other SOC tests were performed, but no SOCs detected, list test methods here: _____

_____

_____

_____

E. Bacterial contamination: YES

Any bacterial detection(s) in the past 3 years in samples taken from the source (not distribution sampling records). ___

Has source (in past 3 years) had a bacteriological contamination problem found in distribution samples that was attributed to the source. ___

Source sampling records for bacteria unavailable ___

Part VI: Geographic or Hydrologic Factors Contributing to a Non-Circular Zone of Contribution

The following questions will help identify those ground water systems which may not be accurately represented by the calculated fixed radius (CFR) method described in Part IV. For these sources, the CFR areas should be used as a preliminary delineation of the critical time of travel zones for that source. As a system develops its Wellhead Protection Plan for theses sources, a more detailed delineation method should be considered.

1)Is there evidence of obvious hydrologic boundaries within the 10 year time of travel zone of the CFR? (Does the largest circle extend over a stream, river, lake, up a steep hillside, and/or over a mountain or ridge?)

___ YES X NO

Describe with references to map produced in Part IV:

_____

_____

2) Aquifer Material:

A) Does the drilling log, well log or other geologic/engineering reports identify that the well is located in an area where the underground conditions are identified as fractured rock and/or basalt terrain?

___ YES X NO

B) Does the drilling log, well log or other geologic/engineering reports indicate that the well is located in an area where the underground conditions are primarily identified as coarse sand and gravel?

___ YES X NO

3) Is the source located in an aquifer with a high horizontal flow rate? (These can include sources located on flood plains of large rivers, artesian wells with high water pressure, and/or shallow flowing wells and springs.)

___ YES _x_ NO

4) Are there other high capacity wells (agricultural, municipal and/or industrial) located within the CFRs?

a) Presence of ground water extraction wells removing more than approximately 500 gal/min within...

	YES	NO	unknown
6 month travel time	___	X	___
6 month–1 year travel time	___	X	___
1–5 year travel time	___	X	___
5–10 year travel time	___	X	___

b) Presence of ground water recharge wells (dry wells) or heavy irrigation within...

	YES	NO	unknown
1 year travel time	___	X	___
1–5 year travel time	___	X	___
5–10 year travel time	___	X	___

Please identify or describe additional hydrologic or geographic conditions that you believe may affect the shape of the zone of contribution for this source. Where possible, reference them to locations on the map produced in Part IV.

Suggestions and Comments

Did you attend one of the susceptibility workshops? ___ YES ___ NO

Did you find it useful? ___ YES ___ NO

Did you seek outside assistance to complete the assessment? ___ YES ___ NO

This form and instruction packet are still in the process of development. Your comments, suggestions and questions will help us upgrade and improve this assessment form. If you found particular sections confusing or problematic please let us know. How could this susceptibility assessment be improved or made clearer? Did the instruction package help you find the information needed to complete the assessment? How much time did it take you to complete the form? Were you able to complete the assessment without additional/outside expertise? Do you feel the assessment was valuable as a learning experience? Any other comments or constructive criticisms you have would be appreciated.

OCEAN PARK WATER CO., INC.
P.O. BOX 618
1407 263 PLACE
OCEAN PARK, WASHINGTON 98640
PHONE: (360) 665-4144

PUMP TEST DATA

DATE April 9, 1996

TESTED BY Pete

TIME	G.P.M.	DEPTH TO WATER LEVEL	DRAWDOWN
0	0	11' 10"	0
1 min	123	26' 0"	14' 2"
5 min	123	29' 5"	17' 7"
30 min	123	29' 9"	17' 11"
1 Hr	123	29' 8"	17' 10"
2 Hr	123	29' 9"	17' 11"
3 Hr	123	29' 9"	17' 11"
4 Hr	123	29' 9"	17' 11"

SYSTEM NAME	Ocean Park Water Co.
SOURCE	Deep Well
LOCATION	Well #8
STATIC LEVEL	11' 10"
PUMP	Jacuzzi
MODEL	75S675-8
OUTLET DIA.	2½"
MOTOR	Franklin 230 V 3Ø
H. P.	7.5 hp

RECOVERY

1 min	13' 0"
5 min	12' 4"
30 min	12' 1"
1 Hr	11' 10"
2 Hr	11' 10"
3 Hr	11' 10"

REMARKS:

TOTAL GALLONS PUMPED	29,520
TOTAL PUMP TIME	4 Hrs.
AVERAGE G.P.M.	123 gpm

EXHIBIT IV-1

EXHIBIT IV-3 WRIA #8 S 09 DOE #8

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 60 11 36 R

UNIQUE WELL I.D. # 229

Water Right Permit No. G2-00759

Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

(1) OWNER: Name Ocean Park Water Address PO Box 68 Ocean Park WA 98640

(2) LOCATION OF WELL: County Pacific NE 1/4 NE 1/4 Sec 6 T. 12 N. R. 11 W

(2a) STREET ADDRESS OF WELL (or nearest address) OAC 178th

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☒ ☐ Irrigation ☐ Test Well ☐ Other ☐ ☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) WELL 8

Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐ Deepened ☐ Cable ☒ Driven ☐ Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches. Drilled 130 feet. Depth of completed well 130 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 8" Diam. from +4 ft. to 106 ft.
Welded ☐ Liner installed ☐ Threaded ☐
" Diam. from ft. to ft.
" Diam. from ft. to ft.

Perforations: Yes ☐ No ☐
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☒ No ☐
Manufacturer's Name Johnson
Type Model No.
Diam. 7" Slot size 8 from 106 ft. to 116 ft.
Diam. 7" Slot size 10 from 126 ft. to 116 ft.

Gravel packed: Yes ☐ No ☐ Size of gravel
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal Bentonite Chips
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 5 ft. below top of well Date 3-6-86
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 40 gal./min. with 31 ft. drawdown after 1 hrs.
Airlest gal./min. with stem set at ft. for hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Brown Sand	0	80
Gray Fine Sand	80	130

COPY

Sold Ocean Park

Work Started 3-5 19 86 Completed 3-6 19 86

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Holt Drilling, Inc. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

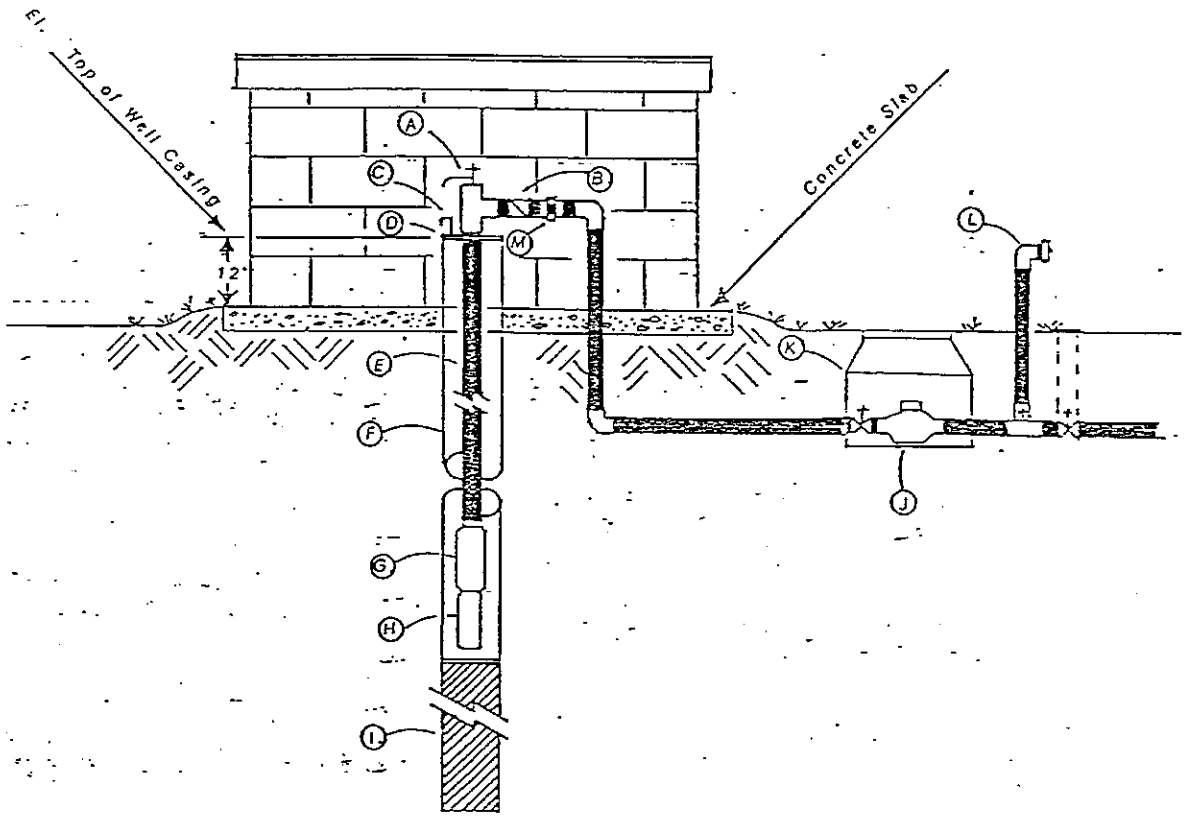
Address 6621 Todd Rd E Puyallup WA 98372

(Signed) J. Wade Thompson (WELL DRILLER) License No. 597

Contractor's Registration No. HOLTOI*736O6 Date 5-7 19 86

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

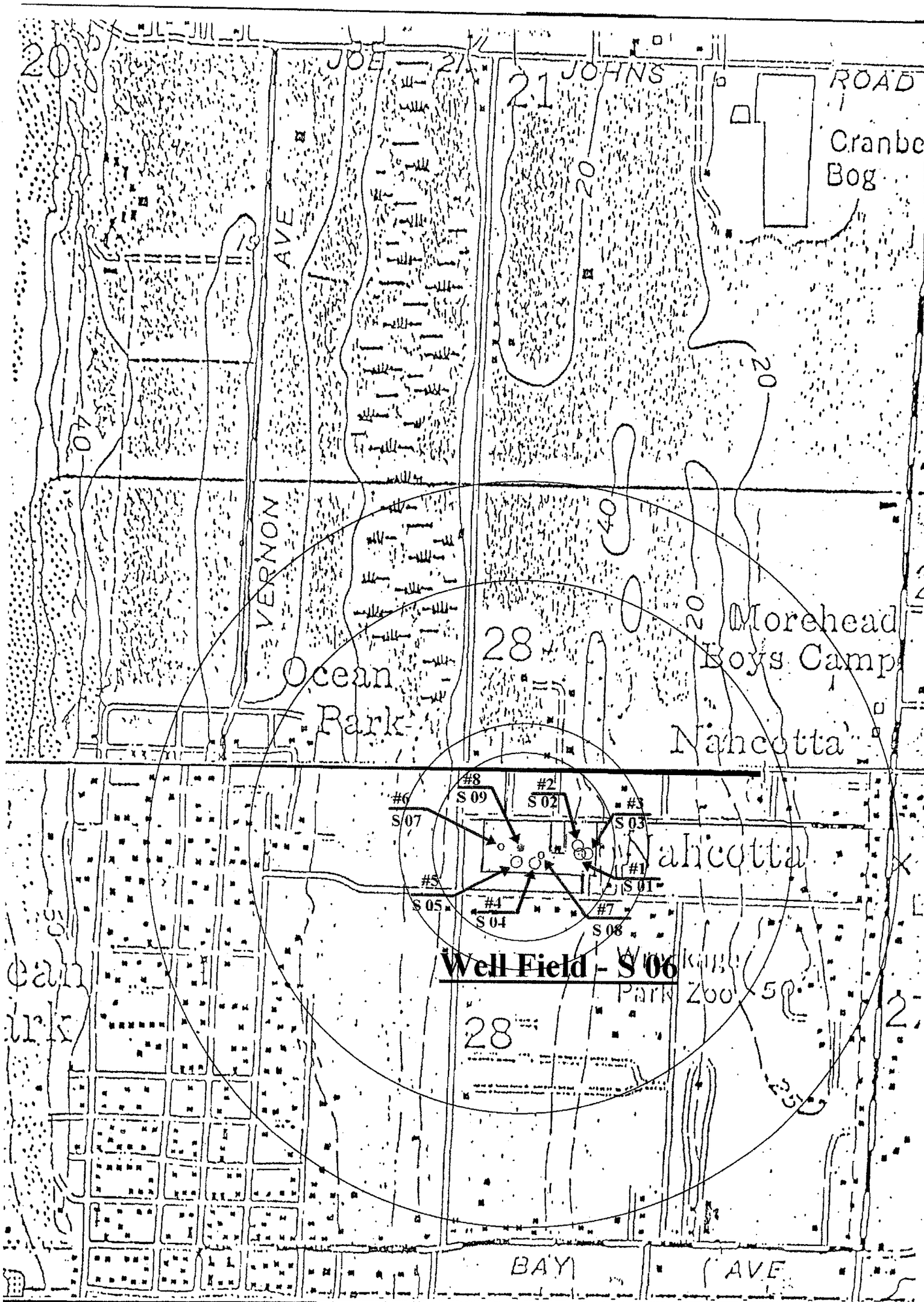


A	Raw Water Sample Tap
B	Swing Check Valve
C	Screened Air Vent / Access Port
D	Well Seal
E	Galvanized Iron Pipe Pump Column
F	Steel Well Casing
G	Jacuzzi Submersible Pump
H	Franklin Motor 230 v. / 3 ph.
I	20' Stainless Steel Well Screen
J	Water Metering Device
K	Meter Vault
L	B:Off Stand Pipe
M	Galvanized Ground Joint Union

TYPICAL:

Deep Well with Submersible Pump, Plumbing and Appurtenance

OCEAN PARK WATER CO.



Project: Susceptibility: #8/SO9
Date:
Scale 1" = 500 feet
Drawing by: *Phillip C Leach*
Approved by:

Ocean Park Water Co., Inc.
P.O. Box 618
25902 Vernon Avenue, Suite C
Ocean Park, WA 98640
Phone: (360) 665-4144

O Well # S 01 is #1
O Well # S 02 is #2
O Well # S 03 is #3
O Well # S 04 is #4
O Well # S 05 is #5
O Well # S 07 is #6
O Well # S 08 is #7
⊗ Well # S 09 is #8

N
W E
S

Ground Water Contamination Susceptibility Assessment Survey Form

Version 2.2

IMPORTANT! Please complete one form for each ground water source (well, wellfield, spring) used in your water system. Photocopy as necessary.

PART I: System Information

Well owner/manager : OCEAN PARK WATER CO. / PETE CHRISTOSON

Water system name : OCEAN PARK WATER CO.

County: PACIFIC

Water system number: 63000 C Source number: #5 05

Well depth: 124 (ft.) (*From WFI form*)

Source name: WELL #5

WA well identification tag number: ___ ___ ___-___ ___ ___

✓ well not tagged

Number of connections: 1913 Population served: _____

Township: 12 N Range: 11

Section: 28 1/4 1/4 Section: SW 1/4 of NE 1/4

Latitude/longitude (if available): _____/_____

How was lat./long. determined?

___ global positioning device ___ survey ___ topographic map
___ other: _____

* Please refer to Assistance Packet for details and explanations of all questions in Parts II through V.

PART II: Well Construction and Source Information

1) Date well originally constructed: 7 / 1 / 86 month/day/year

last reconstruction: ___ / ___ / ___ month/day/year

_____ information unavailable

2) Well driller: PETE SMITH WELL DRILLING

RT 1 Box 266

ABERDEEN, WA. 98520

___ well driller unknown

3) Type of well:

___Drilled: ___ rotary ___ bored ✓ cable (percussion) ___ Dug

___ Other: ___ spring(s) ___ lateral collector (Ranney)

___ driven ___ jetted ___ other: _____

Additional comments: _____

_____

4) Well report available? ✓ YES (attach copy to form) ___ NO

If no well log is available, please attach any other records documenting well construction; e.g. boring logs, "as built" sheets, engineering reports, well reconstruction logs.

5) Average pumping rate: 90 (gallons/min)

Source of information: PUMP TEST DATA

If not documented, how was pumping rate determined? _____

_____

___ Pumping rate unknown

6) Is this source treated? ___ YES ✓ NO

If so, what type of treatment:

___ disinfection ___ filtration ___ carbon filter ___ air stripper ___ other

Purpose of treatment (describe materials to be removed or controlled by treatment):

_____

_____

7) If source is chlorinated, is a chlorine residual maintained: ___ YES ___ NO

Residual level: _____ *(At the point closest to the source.)*

PART III: Hydrogeologic Information

1) Depth to top of open interval: [check one]

___ (less than) 20 ft ___ 20-50 ft ___ 50-10 ft ✓ 100-200 ft ___ (greater than) 200 ft

___ information unavailable

2) Depth to ground water (static water level):

✓ (less than) 20 ft ___ 20-50 ft ___ 50-100 ft ___ (greater than) 100 ft

___ flowing well/spring (artesian)

How was water level determined?

___ well log ✓ other: PUMP TEST DATA- 12/1/87

___ depth to ground water unknown

3) If source is a flowing well or spring, what is the confining pressure:

_____ psi (pounds per square inch)
or
_____ feet above wellhead

4) If source is a flowing well or spring, is there a surface impoundment, reservoir, or catchment associated with this source: ___ YES ___ NO

5) Wellhead elevation (height above mean sea level): _____ (ft)

How was elevation determined? ___ topographic map ___ Drilling/Well Log ___ altimeter

___ other: _____

✓ information unavailable

6) Confining layers: (This can be completed only for those sources with a drilling log, well log or geologic report describing subsurface conditions. Please refer to assistance package for example.)

___ evidence of a confining layer in well log

✓ no evidence of a confining layer in well log

If there is evidence of a confining layer, is the depth to ground water more than 20 feet above the bottom of the lowest confining layer? ___ YES ___ NO

___ information unavailable

7) Sanitary setback:

___ (less than) 100 ft* ✓ 100-120 ft ___ 120-200 ft ___ (greater than) 200 ft
* if less than 100 ft describe the site conditions:

_____

_____

_____

_____

8) Wellhead construction:

✓ wellhead enclosed in a wellhouse

✓ controlled access (describe): LOCK ON WELLHOUSE

_____

___ other uses for wellhouse (describe): _____

_____

___ no wellhead control

9) Surface seal:

✓ 18 ft

___ (less than) 18 ft (no Department of Ecology approval)

___ (less than) 18 ft (Approved by Ecology, include documentation)

___ (greater than) 18 ft

___ depth of seal unknown

___ no surface seal

10) Annual rainfall (inches per year):

___ (less than) 10 in/yr ___ 10-25 in/yr ✓ (greater than) 25 in/yr

PART IV: Mapping Your Ground Water Resource

1) Annual volume of water pumped: 13,942,580 (gallons)

How was this determined?

✓ meter

___ estimated: ✓ pumping rate (90 GPM)

___ pump capacity (_____)

___ other: _____

2) "Calculated Fixed Radius" estimate of ground water movement:
(see Instruction Packet)

6 month ground water travel time : 280 (ft)

1 year ground water travel time : 390 (ft)

5 year ground water travel time: 880 (ft)

10 year ground water travel time: 1,240 (ft)

Information available on length of screened/open interval?

✓ YES ___ NO

Length of screened/open interval: 20 (ft)

3) Is there a river, lake, pond, stream, or other obvious surface water body within the 6 month time of travel boundary? ___ YES ✓ NO (mark and identify on map).

4) Is there a stormwater and/or wastewater facility, treatment lagoon, or holding pond located within the 6 month time of travel boundary? ___ YES ✓ NO (mark and identify on map).

Comments: _____

PART V: Assessment of Water Quality

1) Regional sources of risk to ground water:

Please indicate if any of the following are present within a circular area around your water source having a radius up to and including the five year ground water travel time:

	6 month	1 year	5 year	unknown
likely pesticide application				
stormwater injection wells				
other injection wells				
abandoned ground water well				
landfills, dumps, disposal areas				
known hazardous materials clean-up site				
water system(s) with known quality problems				
population density (greater than) 1 house/acre		✓	✓	
residences commonly have septic tanks		✓	✓	
Wastewater treatment lagoons				
sites used for land application of waste				

Mark and identify on map any of the risks listed above which are located within the 6 month time of travel boundary? (*Please include a map of the wellhead and time of travel areas with this form. Please locate and mark any of the following.*)

If other recorded or potential sources of ground water contamination exist within the ten year time of travel circular zone around your water supply, please describe:

POPULATION DENSITY > 1 HOUSE PER/AC.

RESIDENCE COMMONLY HAVE SEPTIC TANKS

2) Source specific water quality records:

Please indicate the occurrence of any test results since 1986 that meet the following conditions: (Unless listed on assessment, MCLs are listed in assistance package.)

A. Nitrate: (Nitrate MCL = 10 mg/l)	YES
Results greater than MCL	___
(less than) 2 mg/liter nitrate	X
2-5 mg/liter nitrate	___
(greater than) 5 mg/liter nitrate	___
Nitrate sampling records unavailable	___

B. VOCs: (VOC detection level 0.5 ug/l or 0.0005 mg/l.)	YES
Results greater than MCL or SAL	___
VOCs detected at least once	___
VOC test performed but never detected	X
VOC sampling records unavailable	___

C. EDB/DBCP:	YES
(EDB MCL = 0.05 ug/l or 0.00005 mg/l. DBCP MCL = 0.2 ug/l or 0.0002 mg/l.)	
EDB/DBCP detected below MCL at least once	___
EDB/DBCP detected above MCL at least once	___
EDB/DBCP never detected	___
EDB/DBCP tests required but not yet completed	___
EDB/DBCP tests not required	X

D. Other SOCs (pesticides and other synthetic organic chemicals):	YES
Other SOCs detected	___
Other SOC tests performed but none detected *	___
Other SOC tests not performed	___

*If any SOCs in addition to EDB/DBCP were detected, please identify and date. If other SOC tests were performed, but no SOCs detected, list test methods here: _____

_____

_____

_____

E. Bacterial contamination: YES

Any bacterial detection(s) in the past 3 years in samples taken from the source (not distribution sampling records). ___

Has source (in past 3 years) had a bacteriological contamination problem found in distribution samples that was attributed to the source. ___

Source sampling records for bacteria unavailable ___

Part VI: Geographic or Hydrologic Factors Contributing to a Non-Circular Zone of Contribution

The following questions will help identify those ground water systems which may not be accurately represented by the calculated fixed radius (CFR) method described in Part IV. For these sources, the CFR areas should be used as a preliminary delineation of the critical time of travel zones for that source. As a system develops its Wellhead Protection Plan for theses sources, a more detailed delineation method should be considered.

1)Is there evidence of obvious hydrologic boundaries within the 10 year time of travel zone of the CFR? (Does the largest circle extend over a stream, river, lake, up a steep hillside, and/or over a mountain or ridge?)

___ YES ✓ NO

Describe with references to map produced in Part IV:

_____

_____

2) Aquifer Material:

A) Does the drilling log, well log or other geologic/engineering reports identify that the well is located in an area where the underground conditions are identified as fractured rock and/or basalt terrain?

___ YES ✓ NO

B) Does the drilling log, well log or other geologic/engineering reports indicate that the well is located in an area where the underground conditions are primarily identified as coarse sand and gravel?

___ YES ✓ NO

3) Is the source located in an aquifer with a high horizontal flow rate? (These can include sources located on flood plains of large rivers, artesian wells with high water pressure, and/or shallow flowing wells and springs.)

___ YES ✓ NO

4) Are there other high capacity wells (agricultural, municipal and/or industrial) located within the CFRs?

a) Presence of ground water extraction wells removing more than approximately 500 gal/min within...

	YES	NO	unknown
6 month travel time	___	✓	___
6 month–1 year travel time	___	✓	___
1–5 year travel time	___	✓	___
5–10 year travel time	___	✓	___

b) Presence of ground water recharge wells (dry wells) or heavy irrigation within...

	YES	NO	unknown
1 year travel time	___	✓	___
1–5 year travel time	___	✓	___
5–10 year travel time	___	✓	___

Please identify or describe additional hydrologic or geographic conditions that you believe may affect the shape of the zone of contribution for this source. Where possible, reference them to locations on the map produced in Part IV.

Suggestions and Comments

Did you attend one of the susceptibility workshops? ___ YES ___ NO

Did you find it useful? ___ YES ___ NO

Did you seek outside assistance to complete the assessment? ___ YES ___ NO

This form and instruction packet are still in the process of development. Your comments, suggestions and questions will help us upgrade and improve this assessment form. If you found particular sections confusing or problematic please let us know. How could this susceptibility assessment be improved or made clearer? Did the instruction package help you find the information needed to complete the assessment? How much time did it take you to complete the form? Were you able to complete the assessment without additional/outside expertise? Do you feel the assessment was valuable as a learning experience? Any other comments or constructive criticisms you have would be appreciated.

Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

WELL #5

Permit No. ....

(1) OWNER: Name Bear Park Waters Address Bear Park Wash

(2) LOCATION OF WELL: County Pacific Co. NW ¼ NW ¼ Sec 28 T 14 N, R 11 W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☑ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) ....
New well ☑ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☑ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 125 ft. Depth of completed well 124 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 8 " Diam. from -12 ft. to 104 ft.
Threaded ☐ " Diam. from .... ft. to .... ft.
Welded ☐ " Diam. from .... ft. to .... ft.

Perforations: Yes ☐ No ☒
Type of perforator used ....
SIZE of perforations .... in. by .... in.
.... perforations from .... ft. to .... ft.
.... perforations from .... ft. to .... ft.
.... perforations from .... ft. to .... ft.

Screens: Yes ☒ No ☐
Manufacturer's Name ....
Type .... Model No. ....
Diam. 8 Slot size 10 from 104 ft. to 124 ft.
Diam. .... Slot size .... from .... ft. to .... ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: ....
Gravel placed from .... ft. to .... ft.

Surface seal: Yes ☑ No ☐ To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? .... Depth of strata ....
Method of sealing strata off ....

(7) PUMP: Manufacturer's Name ....
Type: .... H.P. ....

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 12 ft. below top of well Date 7-4-86
Artesian pressure .... lbs. per square inch Date ....
Artesian water is controlled by .... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? ....
Yield: .... gal./min. with .... ft. drawdown after .... hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test ....
Bailer test 6 gal./min. with 15 ft. drawdown after .... hrs.
Artesian flow .... g.p.m. Date ....
Temperature of water .... Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Top Soil Dark Brown	0	3
Sand Brown	3	47
Grey SAND	47	90
SAND Blue & Grey	90	124

Work started 7-1 19 86 Completed 7-1 19 86

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Pete Smith Well Drilling
(Person, firm, or corporation) (Type or print)

Address RT #2 Box 1160 Ilwaco Wash

[Signed] .... (Well Driller)

License No. 0105 Date 7-1 19 86

(USE ADDITIONAL SHEETS IF NECESSARY)

S. F. No. 7356—OS—(Rev. 4-71)

Ocean Park Water Co., Inc.
Box 618
Ocean Park, WA 98640

PUMP TEST DATA

DATE 12-01-87

TESTED BY Pete Christoson

TIME	G.P.M.	DEPTH TO WATER LEVEL	DRAWDOWN
0	0	13'-0"	Static
2 min	90	42'-9"	29'-9"
5 min	90	46'-6"	33'-6"
10 min	90	47'-0"	34'-0"
20 min	90	48'-6"	35'-6"
30 min	90	48'-6"	35'-6"
45 min	90	48'-6"	35'-6"
1 hr	90	48'-6"	35'-6"
2 hr	90	48'-6"	35'-6"
3 hr	90	48'-6"	35'-6"
4 hr	90	48'-6"	35'-6"

RECOVERY

0	48'-6"
30 sec	29'-0"
1 min	21'-0"
5 min	14'-3"
10 min	13'-0"

SYSTEM NAME	Ocean Park Water Co. Inc.
SOURCE	Deep Well
LOCATION	Well # 5
STATIC LEVEL	13'-0"
PUMP	Jacuzzi
MODEL	5S6B5
OUTLET DIA.	2½"
MOTOR	Franklin
H. P.	5 230V.

NOTE: No appreciable influence on well #4 or #5 durring the drawdown test

REMARKS:

TOTAL GALLONS PUMPED	21,600 gal.
TOTAL PUMP TIME	4 hr
AVERAGE G.P.M.	90

Please Print Plainly
USE HEAVY PENCIL
DO NOT WRITE IN SHADED AREAS

LABORATORY NAME

LAUCKS TESTING LABS
940 S. HARNEY
SEATTLE, WA 98108

SEE BACK FOR INSTRUCTIONS

WATER SAMPLE INFORMATION FOR INORGANIC CHEMICAL ANALYSES

B. NUMBER	CO.	CITY	DATE RECEIVED	DATE COLLECTED	COLLECTED BY: GREG CHRISTOSON
110169			11/05/82	11/03/82	Telephone: (206) 6665 - 5/1984

Is this a follow up of a previous out of compliance sample? Yes ☐ No ☒

If yes, what was the laboratory number of the previous sample? — — — — — — —

SYSTEM I.D. NO.	SYSTEM NAME:	SYSTEM CLASS (circle one)	COUNTY
53000C	OCEAN PARK WATER CO. INC.	1 2 3 4	PACIFIC

SAMPLE LOCATION	THIS SAMPLE TAKEN BEFORE TREATMENT	IF TAKEN *AFTER* TREATMENT WAS IT
1	☒ AFTER (U) ☐ (T)	___FILTERED ___FLUORIDATED ___CHLORINATED ___WATER SOFTENER: TYPE USED

SOURCE TYPE:	SOURCE NO.	IF SOURCE IS LAKE OR STREAM, ENTER NAME	IF SAMPLE WAS DRAWN FROM DISTRIBUTION SYSTEM IT WAS COLLECTED FROM SYSTEM AT: (ADDRESS)
___1. SURFACE ✓3. WELL ___2. SPRING ___4. PURCHASE	05		

DATE OF FINAL REPORT: 11/18/82

SEND REPORT TO: (PRINT FULL NAME & ADDRESS)
OCEAN PARK WATER CO.
Name
PO BOX 618
Street
OCEAN PARK, WA. 98640
CITY ZIP CODE
Telephone: (206) 6665 - 5/1984
Area Code

REMARKS:
BOTH SAMPLE CONTAINERS HAD DUST & FILTH IN THEM WHEN WE RECEIVED THEM?

LABORATORY REPORT
(DO NOT WRITE BELOW THIS LINE)

TESTS	*MCL		Less Than	RESULTS		Compliance YES	Compliance NO	Chemist Initials	Laboratory Number (If different than above)
Arsenic As	0.05	P		0.011	mg/l	✓		HK	
Barium Ba	1.0	P	<	0.25	mg/l	✓			
Cadmium Cd	0.01	P	<	0.002	mg/l	✓			
Chromium Cr	0.05	P	<	0.01	mg/l	✓			
Iron Fe	0.3			0.19	mg/l	✓			
Lead Pb	0.05	P	<	0.01	mg/l	✓			
Manganese Mn	0.05			0.033	mg/l	✓			
Mercury Hg	0.002	P	<	0.001	mg/l	✓			
Selenium Se	0.01	P	<	0.005	mg/l	✓			
Silver Ag	0.05	P	<	0.01	mg/l	✓			
Sodium Na				23	mg/l				
Hardness				140	mg/l As CaCO3				
Conductivity	700			00	Micromhos/cm 25° C	✓			
Turbidity	1.0	P	<	0.5	NTU	✓			
Color	15.0			5.0	Color Units	✓			
Fluoride F	2.0	P	<	0.2	mg/l	✓			
Nitrate as N	10.0	P	<	0.2	mg/l	✓			
Chloride Cl	250			20	mg/l	✓		✓	
Sulfate SO_4	250				mg/l				

*MCL is the Maximum Contaminant Level Allowed
P Primary Standard

Laboratory Supervisor

DSHS 4-92G (10-79) WATER SUPPLIER COPY

SUPERSEDING

CERTIFICATE OF WATER RIGHT

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1[illegible], amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
March 16, 1987	G2-27073	G2-27073 P	G2-27073 C

NAME
Ocean Park Water Company, Inc.

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
Post Office Box 618	Ocean Park	Washington	98640

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well No. 5

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	105	252

QUANTITY, TYPE OF USE, PERIOD OF USE		
252 acre-feet per year (supplemental)	Municipal supply	Year-round, as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION/WITHDRAWAL
504 feet east and 265 feet north of the center of Section 28.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW¼NE¼	28	11 W	11 W	24	Pacific

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by Ocean Park Water Company Inc.

FILED AT THE REQUEST OF
ROBERT L. JOHNSON
AUDITOR & RECORDER
COUNTY OF PACIFIC
97 JAN 30 PM 1:11

9101 PAGE 839

CERTIFICATE

When the chloride concentration exceeds 250 mg/L, the withdrawal rate shall be reduced or the pump setting raised to reduce the chloride level to below 250 mg/L.

Issued as a supplemental source of supply to rights enjoyed under Ground Water Certificates G2-00759 C, G2-21399 C, and G2-25737 C.

The Water Resources Act of 1971 specifies certain criteria regarding utilization and management of the waters of the state in the best public interest. Use of water may be subject to regulation at certain times, based on the necessity to maintain water quantities sufficient for preservation of the natural environment.

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.020.

This certificate of water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

Given under my hand and the seal of this office at Olympia, Washington,

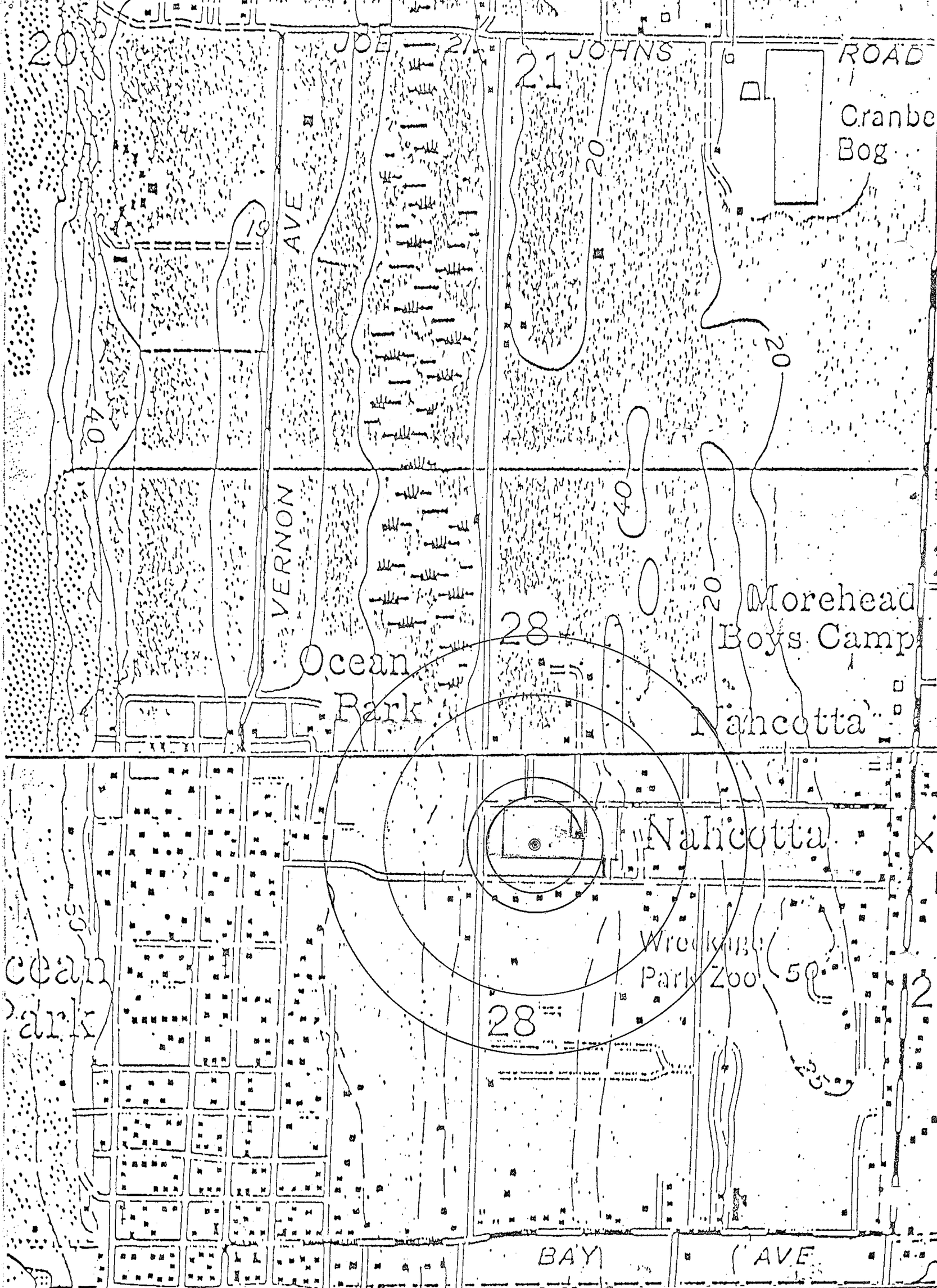
this 2nd *day of* January, *19* 91.

Christine O. Gregoire, Director
Department of Ecology

ENGINEERING DATA
OK GP by Jane Bloomstrom

FOR COUNTY USE ONLY

9101 PAGE 810



Date

Scale 1"=500'

Drawing by SYSTEM I.D. 63000C

Approved by

OCEAN PARK WATER CO., INC.
P.O. BOX 618
1407 263 PLACE
OCEAN PARK, WASHINGTON 98640
PHONE: (206) 665-4144

- ○ Well #S 01
- ○ Well #S 02
- ○ Well #S 03
- ○ Well #S 04
- ◉ Well #S 05

N
W
E
S

Ground Water Contamination Susceptibility Assessment Survey Form

Version 2.2

IMPORTANT! Please complete one form for each ground water source (well, wellfield, spring) used in your water system. Photocopy as necessary.

PART I: System Information

Well owner/manager : OCEAN PARK WATER CO. / PETE CHRISTOSON

Water system name : OCEAN PARK WATER CO.

County: PACIFIC

Water system number: 63000 C Source number: #S 04

Well depth: 120' (ft.) (*From WFI form*)

Source name: WELL #4

WA well identification tag number: ___ ___ ___-___ ___ ___

✓ well not tagged

Number of connections: 1913 Population served: ___

Township: 12 N Range: 11

Section: 28 1/4 1/4 Section: SW¼ of NE¼

Latitude/longitude (if available): ___/___

How was lat./long. determined?

___ global positioning device ___ survey ___ topographic map
___ other: ___

* Please refer to Assistance Packet for details and explanations of all questions in Parts II through V.

PART II: Well Construction and Source Information

1) Date well originally constructed: 9 / 25 / 81 month/day/year

last reconstruction: ___ / ___ / ___ month/day/year

___ information unavailable

2) Well driller: SMITH DRILLING INC.
ST. RT. BOX 32
COSMOPOLIS, WA.

___ well driller unknown

3) Type of well:

___Drilled: ___ rotary ___ bored ✓ cable (percussion) ___ Dug

___ Other: ___ spring(s) ___ lateral collector (Ranney)

___ driven ___ jetted ___ other: _____

Additional comments: _____

4) Well report available? ✓ YES (attach copy to form) ___ NO

If no well log is available, please attach any other records documenting well construction; e.g. boring logs, "as built" sheets, engineering reports, well reconstruction logs.

5) Average pumping rate: 125 GPM (gallons/min)

Source of information: PUMP TEST DATA 5/10/81

If not documented, how was pumping rate determined? _____

___ Pumping rate unknown

6) Is this source treated? ___ YES ✓ NO

If so, what type of treatment:

___ disinfection ___ filtration ___ carbon filter ___ air stripper ___ other

Purpose of treatment (describe materials to be removed or controlled by treatment):

7) If source is chlorinated, is a chlorine residual maintained: ___ YES ___ NO

Residual level: _____ (*At the point closest to the source.*)

PART III: Hydrogeologic Information

1) Depth to top of open interval: [check one]

___ (less than) 20 ft ___ 20–50 ft ___ 50–10 ft ✓ 100–200 ft ___ (greater than) 200 ft

___ information unavailable

2) Depth to ground water (static water level):

✓ (less than) 20 ft ___ 20–50 ft ___ 50–100 ft ___ (greater than) 100 ft

___ flowing well/spring (artesian)

How was water level determined?

___ well log ___ other: PUMP TEST DATA 5/10/81

___ depth to ground water unknown

3) If source is a flowing well or spring, what is the confining pressure:

_____ psi (pounds per square inch)
or
_____ feet above wellhead

4) If source is a flowing well or spring, is there a surface impoundment, reservoir, or catchment associated with this source: ___ YES ___ NO

5) Wellhead elevation (height above mean sea level): _____ (ft)

How was elevation determined? ___ topographic map ___ Drilling/Well Log ___ altimeter

___ other: _____

✓ information unavailable

6) Confining layers: (This can be completed only for those sources with a drilling log, well log or geologic report describing subsurface conditions. Please refer to assistance package for example.)

___ evidence of a confining layer in well log

✓ no evidence of a confining layer in well log

If there is evidence of a confining layer, is the depth to ground water more than 20 feet above the bottom of the lowest confining layer? ___ YES ___ NO

✓ information unavailable

7) Sanitary setback:

___ (less than) 100 ft* ✓ 100–120 ft ___ 120–200 ft ___ (greater than) 200 ft
* if less than 100 ft describe the site conditions:

_____

_____

_____

_____

8) Wellhead construction:

✓ wellhead enclosed in a wellhouse

___ controlled access (describe): LOCK ON WELLHOUSE

_____

___ other uses for wellhouse (describe): PUMP CONTROL RM. #2

_____

___ no wellhead control

9) Surface seal:

✓ 18 ft

___ (less than) 18 ft (no Department of Ecology approval)

___ (less than) 18 ft (Approved by Ecology, include documentation)

___ (greater than) 18 ft

___ depth of seal unknown

___ no surface seal

10) Annual rainfall (inches per year):

___ (less than) 10 in/yr ___ 10-25 in/yr ✓ (greater than) 25 in/yr

PART IV: Mapping Your Ground Water Resource

1) Annual volume of water pumped: 40,759,250 (gallons)

How was this determined?

✓ meter

___ estimated: ___ pumping rate (_____)

___ pump capacity (_____)

___ other: _____

2) "Calculated Fixed Radius" estimate of ground water movement:
(see Instruction Packet)

6 month ground water travel time : 440 (ft)

1 year ground water travel time : 620 (ft)

5 year ground water travel time: 1390 (ft)

10 year ground water travel time: 1970 (ft)

Information available on length of screened/open interval?

✓ YES ___ NO

Length of screened/open interval: 20 (ft)

3) Is there a river, lake, pond, stream, or other obvious surface water body within the 6 month time of travel boundary? ___ YES ✓ NO (mark and identify on map).

4) Is there a stormwater and/or wastewater facility, treatment lagoon, or holding pond located within the 6 month time of travel boundary? ___ YES ✓ NO (mark and identify on map).

Comments: _____

_____

_____

_____

_____

PART V: Assessment of Water Quality

1) Regional sources of risk to ground water:.

Please indicate if any of the following are present within a circular area around your water source having a radius up to and including the five year ground water travel time:

	6 month	1 year	5 year	unknown
likely pesticide application	___	___	___	___
stormwater injection wells	___	___	___	___
other injection wells	___	___	___	___
abandoned ground water well	___	___	___	___
landfills, dumps, disposal areas	___	___	___	___
known hazardous materials clean-up site	___	___	___	___
water system(s) with known quality problems	___	___	___	___
population density (greater than) 1 house/acre	___	X	X	___
residences commonly have septic tanks	___	X	X	___
Wastewater treatment lagoons	___	___	___	___
sites used for land application of waste	___	___	___	___

Mark and identify on map any of the risks listed above which are located within the 6 month time of travel boundary? (*Please include a map of the wellhead and time of travel areas with this form. Please locate and mark any of the following.*)

If other recorded or potential sources of ground water contamination exist within the ten year time of travel circular zone around your water supply, please describe:

POPULATION DENSITY > 1 HOUSE PER/AC.

RESIDENCE COMMONLY HAVE Septic TANKS

2) Source specific water quality records:

Please indicate the occurrence of any test results since 1986 that meet the following conditions: (Unless listed on assessment, MCLs are listed in assistance package.)

A. Nitrate: (Nitrate MCL = 10 mg/l)	YES
Results greater than MCL	___
(less than) 2 mg/liter nitrate	XX « ok
2-5 mg/liter nitrate	___
(greater than) 5 mg/liter nitrate	___
Nitrate sampling records unavailable	~~X~~ no SO4 data; system NO3 is <2

B. VOCs: (VOC detection level 0.5 ug/l or 0.0005 mg/l.)	YES
Results greater than MCL or SAL	___
VOCs detected at least once	___
VOC test performed but never detected	X
VOC sampling records unavailable	___

C. EDB/DBCP:	YES
(EDB MCL = 0.05 ug/l or 0.00005 mg/l. DBCP MCL = 0.2 ug/l or 0.0002 mg/l.)	
EDB/DBCP detected below MCL at least once	___
EDB/DBCP detected above MCL at least once	___
EDB/DBCP never detected	___
EDB/DBCP tests required but not yet completed	___
EDB/DBCP tests not required	X

D. Other SOCs (pesticides and other synthetic organic chemicals):	YES
Other SOCs detected	___
Other SOC tests performed but none detected *	___
Other SOC tests not performed	___

*If any SOCs in addition to EDB/DBCP were detected, please identify and date. If other SOC tests were performed, but no SOCs detected, list test methods here: _____

_____

_____

_____

E. Bacterial contamination: YES

Any bacterial detection(s) in the past 3 years in samples taken from the source (not distribution sampling records). ___

Has source (in past 3 years) had a bacteriological contamination problem found in distribution samples that was attributed to the source. ___

Source sampling records for bacteria unavailable ___

Part VI: Geographic or Hydrologic Factors Contributing to a Non-Circular Zone of Contribution

The following questions will help identify those ground water systems which may not be accurately represented by the calculated fixed radius (CFR) method described in Part IV. For these sources, the CFR areas should be used as a preliminary delineation of the critical time of travel zones for that source. As a system develops its Wellhead Protection Plan for theses sources, a more detailed delineation method should be considered.

1)Is there evidence of obvious hydrologic boundaries within the 10 year time of travel zone of the CFR? (Does the largest circle extend over a stream, river, lake, up a steep hillside, and/or over a mountain or ridge?)

___ YES X NO

Describe with references to map produced in Part IV:

_____

_____

2) Aquifer Material:

A) Does the drilling log, well log or other geologic/engineering reports identify that the well is located in an area where the underground conditions are identified as fractured rock and/or basalt terrain?

___ YES X NO

B) Does the drilling log, well log or other geologic/engineering reports indicate that the well is located in an area where the underground conditions are primarily identified as coarse sand and gravel?

___ YES X NO

3) Is the source located in an aquifer with a high horizontal flow rate? (These can include sources located on flood plains of large rivers, artesian wells with high water pressure, and/or shallow flowing wells and springs.)

___ YES X NO

4) Are there other high capacity wells (agricultural, municipal and/or industrial) located within the CFRs?

a) Presence of ground water extraction wells removing more than approximately 500 gal/min within...

	YES	NO	unknown
6 month travel time	___	X	___
6 month-1 year travel time	___	X	___
1-5 year travel time	___	X	___
5-10 year travel time	___	X	___

b) Presence of ground water recharge wells (dry wells) or heavy irrigation within...

	YES	NO	unknown
1 year travel time	___	X	___
1-5 year travel time	___	X	___
5-10 year travel time	___	X	___

Please identify or describe additional hydrologic or geographic conditions that you believe may affect the shape of the zone of contribution for this source. Where possible, reference them to locations on the map produced in Part IV.

Suggestions and Comments

Did you attend one of the susceptibility workshops? ___ YES ___ NO

Did you find it useful? ___ YES ___ NO

Did you seek outside assistance to complete the assessment? ___ YES ___ NO

This form and instruction packet are still in the process of development. Your comments, suggestions and questions will help us upgrade and improve this assessment form. If you found particular sections confusing or problematic please let us know. How could this susceptibility assessment be improved or made clearer? Did the instruction package help you find the information needed to complete the assessment? How much time did it take you to complete the form? Were you able to complete the assessment without additional/outside expertise? Do you feel the assessment was valuable as a learning experience? Any other comments or constructive criticisms you have would be appreciated.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. .....

Permit No. .....

(1) OWNER: Name Ocean Park Water Co. Address Ocean Park

(2) LOCATION OF WELL: County Pacific NW ¼ SE ¼ Sec. 28 T. 12 N., R. 11 W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) .....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 120 ft. Depth of completed well 120 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 8 " Diam. from 0 ft. to 100 ft.
Threaded ☐ ..... " Diam. from ..... ft. to ..... ft.
Welded ☐ ..... " Diam. from ..... ft. to ..... ft.

Perforations: Yes ☐ No ☒
Type of perforator used .....
SIZE of perforations ..... in. by ..... in.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

Screens: Yes ☒ No ☐ Manufacturer's Name Johnson
Type Telescope Model No. .....
Diam. 8 Slot size 18 from 100 ft. to 120 ft.
Diam. ..... Slot size ..... from ..... ft. to ..... ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? ..... Depth of strata .....
Method of sealing strata off .....

(7) PUMP: Manufacturer's Name .....
Type: ..... H.P. .....

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 14 ft. below top of well Date .....
Artesian pressure ..... lbs. per square inch Date .....
Artesian water is controlled by ..... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom? .....
Yield: ..... gal./min. with ..... ft. drawdown after ..... hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test .....
Bailer test ..... gal./min. with ..... ft. drawdown after ..... hrs.
Artesian flow ..... g.p.m. Date .....
Chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Brown Sand	0	62
Grey Sand	62	120

Work started April 21, 19 81 Completed April 25, 19 81

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Smith Drilling Inc.
(Person, firm, or corporation) (Type or print)

Address 51 Rt. Box 32 Cosmopolis

[Signed] Randy Smith (Well Driller)

License No. 0479 Date April 25, 19 81

(USE ADDITIONAL SHEETS IF NECESSARY)

PUMP TEST DATA

DATE 5-10-81

TESTED BY pete

TIME	G.P.M.	DEPTH TO WATER LEVEL	DRAWDOWN
-0-	-0-	12'-6"	static
2 min.	125	43'-0"	30'-4"
5 min.	"	47'-2"	34'-6"
10 min.	"	48'-2"	35'-6"
20 min	"	48'-10"	36'-4"
30 min.	"	48'-10"	36'-4"
1 hr.	125	"	"
2hr.	"	"	"
3 hr.	"	"	"
4 hr.	"	"	"

SYSTEM NAME	Ocean Park Water Co. Inc.
SOURCE	deep well
LOCATION	well #4
STATIC LEVEL	12'-6"
PUMP	Jacuzzi
MODEL	7SS6A
OUTLET DIA.	2½"
MOTOR	Franklin
H. P.	7½ 230 v 3 phase

RECOVERY

-0-	48'-10"
30 sec.	30'-0"
1 min.	19'-6"
5 min.	13'-6"
10 min.	12'-6"
30 min.	12'-6"

REMARKS:

TOTAL GALLONS PUMPED	30,000
TOTAL PUMP TIME	4 hrs.
AVERAGE G.P.M.	125

Laucks Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX 767-5063

Chemistry, Microbiology, and Technical Services

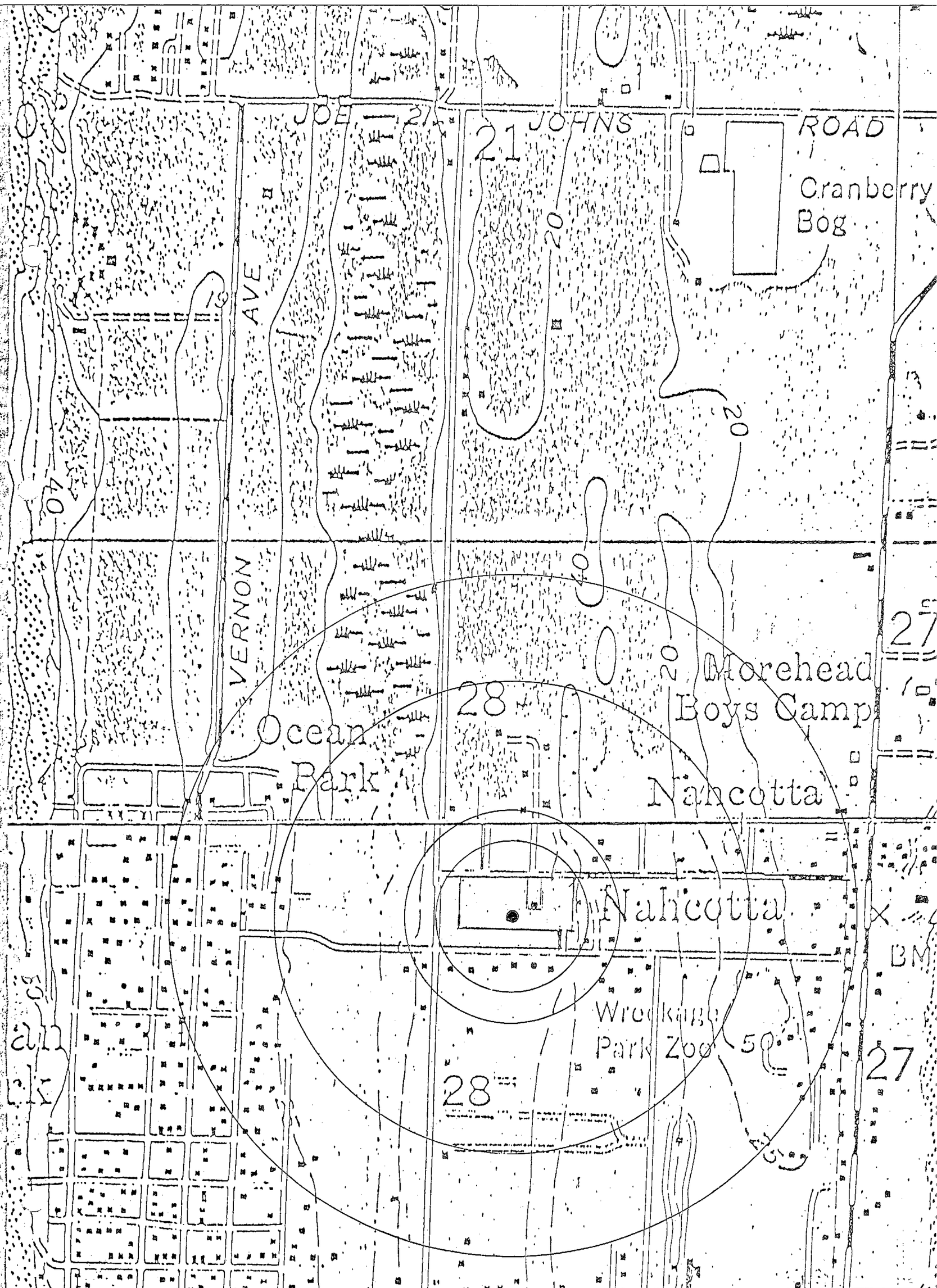
REPORT ON SAMPLE: 9105991-01
Client Sample ID: Ocean Park Water Co.

Date Received : 05/29/91 Collection Date : 05/24/91

Test	MCL		Results	
Arsenic	0.05	<	0.010	mg/L
Barium	1.0	<	0.25	mg/L
Cadmium	0.01	<	0.002	mg/L
Chromium	0.05	<	0.010	mg/L
Iron	0.3		0.15	mg/L
Lead	0.05	<	0.005	mg/L
Manganese	0.05		0.069	mg/L
Mercury	0.002	<	0.001	mg/L
Selenium	0.01	<	0.005	mg/L
Silver	0.05	<	0.010	mg/L
Sodium			21	mg/L
Hardness			79	mg/L, as CaCO3
Conductivity	700		250	Micromhos/cm, 25.C
Turbidity	1.0	<	0.5	NTU
Color	15.0	<	5.0	Color Units
Fluoride	2.0	<	0.2	mg/L
Nitrate	10.0		0.2	mg/L
Chloride	250		25	mg/L
Sulfate	250	<	10	mg/L
Copper	1.0	<	0.3	mg/L
Zinc	5.0	<	0.3	mg/L

MCL = Maximum Contamination Level established for drinking water under current EPA and State of Washington regulations. No MCL has been established for hardness or sodium, although 20 mg/L is a recommended MCL for sodium.

The Maximum Contamination Level (MCL) for lead is 0.05 mg/L. The State of Washington's Department of Health and the EPA are asking your laboratory to advise you that if the level of lead in your drinking water is above 0.02 mg/L (even if it is below the MCL), the EPA recommends corrective action. You should follow the EPA's guidance, found in the EPA booklet 'Lead in School Drinking Water.' The laboratory does not have copies of this booklet; contact the EPA Safe Drinking Water Hotline at 1-800-426-4791.



Date

Scale 1"=500'

Drawing by SYSTEM I.D. 63000C

Approved by

OCEAN PARK WATER CO., INC.
P.O. BOX 618
1407 263 PLACE
OCEAN PARK, WASHINGTON 98640
PHONE: (206) 665-4144

- ○ Well #S 01
- ○ Well #S 02
- ○ Well #S 03
- ● Well #S 04
- ○ Well #S 05

N W S

Wiegardt Well No. 1
Proposed Point of Withdrawal

WELL NO. 1

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

Construction/Decommission *("x" in circle)*

(•) Construction
( ) Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☑ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☑ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☑ Cable ☐ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 8" inches, drilled 175' ft.
Depth of completed well 140' ft.

CONSTRUCTION DETAILS

Casing Installed: ☑ Welded 8" Diam. from 12' ft. to 110' ft.
☐ Liner installed _____" Diam. from _____ ft. to _____ ft.
☐ Threaded _____" Diam. from _____ ft. to _____ ft.

Perforations: ☐ Yes ☑ No
Type of perforator used _____
SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☑ Yes ☐ No ☐ K-Pac Location _____
Manufacturer's Name Johnson
Type 304 S.S. cont. wrap v-wire Model No. 304 S.S.
Diam. 5" Slot size 20 from 138' ft. to 118' ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☑ Yes ☐ No ☐ Size of gravel/sand 10/20 silica
Materials placed from 149' ft. to 96.5 ft.

Surface Seal: ☑ Yes ☐ No To what depth? 20' ft.
Material used in seal 3/8" bentonite chips
Did any strata contain unusable water? ☐ Yes ☑ No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level 20' ft.
Static level 11.25 ft. below top of well Date 08/18/13
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☑ Yes ☐ No If yes, by whom? RobinsonNobl
Yield: 151 gal./min. with 18' ft. drawdown after 24.0 hrs.
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
1	12.98	10	11.5	30	11.25
3	12.04	14	11.4	60	11.18
5	11.80	20	11.3		

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water 51F Was a chemical analysis made? ☑ Yes ☐ No

CURRENT
Notice of Intent No. W353207
Unique Ecology Well ID Tag No. BAF-021
Water Right Permit No. 10351
Property Owner Name North Beach Water District
Well Street Address 252nd St. / between "U" St. & Ash Pl.
City Ocean Park County Pacific
Location SW 1/4-1/4 NE 1/4 Sec 33 Twn 12 R 11 EWM or WWM ☐ circle ☑ one
Lat/Long (s, t, r **Still REQUIRED**) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____
Tax Parcel No. 1211331300

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
brown silty sand	0	1
red silty sand	1	2
grey sand	2	4
brown silty sand	4	7
brown silt / grey sand - trace h20	7	23
brown silty sand	23	36
grey sand - slightly silty	36	47
grey sand - trace wood	47	49
grey sand	49	56
grey sand w/wood	56	63
grey sand - trace small gravel	63	81
grey silty sand	81	93
course grey sand - dirty	93	99
grey silty sand - getting tighter	99	103
grey sand - dirty	103	109
clean grey sand - trace wood	109	116
grey sand - siltier - trace wood	116	117
grey sand w/seashells & wood	117	119
grey sand - getting dirtier	119	121
trace clay lenses	121	124
grey sand w/grey clay layers & wood	124	137
grey sand - cleaner driving - better	137	142
grey sand - getting siltier	142	145
fine grey sand - silty w/wood	145	150
fine grey sand - cleaner	150	154
grey sand w/silt lenses w/wood & trace pebbles	154	172'6"
dirty grey sand w/wood - trace seashells	172'6"	173'6"
grey clay	173'6"	175

Start Date 08/14/2013 Completed Date 09/23/2013

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☐ Driller ☐ Engineer ☐ Trainee Name (Print) Driller - Darrell Feavel
Driller/Engineer/Trainee Signature _____
Driller or trainee License No 2398

IF TRAINEE,
Driller's Licensed No. _____
Driller's Signature _____

Drilling Company Bison Well Drilling & Septic, LLC
Address PO Box 5142
City, State, Zip Spanaway, WA 98387
Contractor's Registration No. BISONWD945R9 Date 09/30/2013

Ecology is an Equal Opportunity Employer.

ECY 050-1-20 (Rev 3/05) **The Department of Ecology does NOT warranty the Data and/or Information on this Well Report.**

Wiegardt Well No. 2
Proposed Point of Withdrawal

WELL No. 2

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

Construction/Decommission *("x" in circle)*

- [x] Construction
- [ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☑ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____
☑ New well ☐ Reconditioned ☐ Deepened — *Method:* ☐ Dug ☐ Bored ☐ Driven ☑ Cable ☐ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 8" inches, drilled 150' ft.
Depth of completed well 149' ft.

CONSTRUCTION DETAILS
Casing Installed: ☑ Welded 8" Diam. from +2.5 ft. to 121' ft.
☐ Liner installed _____" Diam. from _____ ft. to _____ ft.
☐ Threaded _____" Diam. from _____ ft. to _____ ft.

Perforations: ☐ Yes ☑ No
Type of perforator used _____
SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☑ Yes ☐ No ☐ K-Pac Location _____
Manufacturer's Name Johnson
Type 304 S.S. cont. wrap v-wire Model No. 304 S.S.
Diam. 5" Slot size 20 from 141' ft. to 120' ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☑ Yes ☐ No ☐ Size of gravel/sand 10/20 silica
Materials placed from 149' ft. to 100' ft.

Surface Seal: ☑ Yes ☐ No To what depth? 18' ft.
Material used in seal 3/8" bentonite chips
Did any strata contain unusable water? ☐ Yes ☑ No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level 22' ft
Static level 10.18 ft. below top of well Date 01/16/14
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☑ Yes ☐ No If yes, by whom? Bison
Yield: 151' gal./min. with 20' ft. drawdown after 24.0 hrs.
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
1 min	12.54	10 min	10.62	30 min	10.30
3 min	11.35	14 min	10.50	105min	10.18
5 min	10.95	23 min	10.39		

Date of test 01/16/14 > 01/17/2014
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs
Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water 51F Was a chemical analysis made? ☑ Yes ☐ No

CURRENT
Notice of Intent No. W35321
Unique Ecology Well ID Tag No. BAF- 024
Water Right Permit No. 10351
Property Owner Name North Beach Water District
Well Street Address 252nd St. / Between "U" St. & Ash Pl.
City Ocean Park County Pacific
Location SW 1/4-1/4 NE 1/4 Sec 33 Twn 12 R 11 EWM ☐ or WWM ☑ circle one
Lat/Long (s, t, r Still REQUIRED) Lat Deg _____ Lat Min/Sec _____
Long Deg _____ Long Min/Sec _____
Tax Parcel No. 1211331300

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
reddish brown silty sand	0	3
brown sand	3	9
brown silty sand	9	14
brown dirty sand - moist	14	28
brown silty sand - h20	28	37
brown slightly silty sand w/wood & h20	37	45
brown/grey slightly silty sand	45	49
grey clean sand w/trace mica	49	87
brown silty grey sand	87	95
brown silty grey sand - trace wood	95	97
clean grey sand	97	100
grey sand - trace gravel	100	104
finer grey sand - slightly silty - driving lighter	104	112
grey silty sand w/hard thin clay lenses	112	115
grey silty sand w/wood	115	118
grey sand - loose	118	120
fine brown/grey sand - silty - hard to drive	120	122
dark grey dirty sand w/shells & wood	122	124
loose dark grey sand w/shells - hard clay lenses	124	127
large pieces of wood	127	128
clean grey/brown sand	128	135
thin grey silt lenses w/wood & mica	135	136
clean grey sand w/wood	136	139
brown sand - little finer - getting dirtier	139	150

Start Date 12/02/2013 Completed Date 01/22/2014

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☑ Driller ☐ Engineer ☐ Trainee Name (Print) Driller - Darrell Feavel
Driller/Engineer/Trainee Signature _____
Driller or trainee License No. 2396

IF TRAINEE,
Driller's Licensed No. _____
Driller's Signature _____

Drilling Company Bison Well Drilling & Septic, LLC
Address PO Box 5142
City, State, Zip Spanaway, WA 98387
Contractor's Registration No. BISONWD945R9 Date 01/21/2014

Ecology is an Equal Opportunity Employer.

ECY 050-1-20 (Rev 3/05) **The Department of Ecology does NOT warranty the Data and/or Information on this Well Report.**

Wiegardt Well No. 3
Proposed Point of Withdrawal

Well No 3

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

Construction/Decommission *("x" in circle)*

- [x] Construction
- [ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

PROPOSED USE: [ ] Domestic [ ] Industrial [x] Municipal [ ] DeWater [ ] Irrigation [ ] Test Well [ ] Other _____

TYPE OF WORK: Owner's number of well (if more than one) Well#3

[x] New well [ ] Reconditioned Method: [ ] Dug [ ] Bored [ ] Driven [ ] Deepened [x] Cable [ ] Rotary [ ] Jetted

DIMENSIONS: Diameter of well 8" inches, drilled 172' ft.
Depth of completed well 150' ft.

CONSTRUCTION DETAILS

Casing Installed: [x] Welded 8" Diam. from +2'6" ft. to 121' BLS ft.
[ ] Liner installed " Diam. from ft. to ft.
[ ] Threaded " Diam. from ft. to ft.

Perforations: [ ] Yes [x] No
Type of perforator used _____
SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: [x] Yes [ ] No [ ] K-Pac Location _____
Manufacturer's Name Johnson
Type 304 S.S. cont. wrap v-wire Model No. 304 S.S.
Diam. 5" Slot size 20 from 142' ft. to 121' ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: [x] Yes [ ] No [x] Size of gravel/sand 10/20 silica
Materials placed from 150' ft. to 101' ft.

Surface Seal: [x] Yes [ ] No To what depth? 18' ft.
Material used in seal 3/8" bentonite chips
Did any strata contain unusable water? [ ] Yes [x] No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 9.52 TOC ft. below top of well Date 02/25/14
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? [x] Yes [ ] No If yes, by whom? Robinson Noble
Yield: 151 gal./min. with 18.47 ft. drawdown after 72.0 hrs.
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
1 min	11.86	15 min	9.92	90 min	9.61
5 min	10.40	30 min	9.70		
10 min	10.04	60 min	9.54		

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water 51 F Was a chemical analysis made? [x] Yes [ ] No

CURRENT
Notice of Intent No. W353212
Unique Ecology Well ID Tag No. BAF-025
Water Right Permit No. 10351
Property Owner Name North Beach Water District
Well Street Address 252nd St / Between "U" St. & Ash Pl.
City Ocean Park County Pacific
Location SW 1/4-1/4 NE 1/4 Sec 33 Twn 12 R 11 EWM or WWM [x] circle one
Lat/Long (s, t, r Still REQUIRED) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____
Tax Parcel No. 1211331300

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
dark brown top soil	0	1
tan colored silty sand	1	5
brown silty sand w/trace wood	5	12
log	12	14
brown silty grey sand - trace wood - trace h20	14	24
brown silty sand - h20	24	37
brown / grey silt w/ grey sand	37	49
grey silt lenses w/grey sand/wood	49	53
dirty grey sand - getting courser	53	61
grey silty sand w/wood - tight	61	66
dirty grey sand - bail/drive - heaving	66	69
clean heaving grey sand	69	82
brown silty grey sand w/wood	82	84
dirty grey sand - trace gravel/wood	84	89
dirty grey sand	89	100
dirty grey sand w/seashells	100	102
dirty grey/brown sand	102	112
dirty grey/brown sand w/wood-gravel-seashells	112	121
grey/brown sand - driving loosely	121	125
thin hard grey clay lenses	125	126
grey/brown sand - bail/drive	126	138
brown/grey sand w/trace wood-seashells	138	145
brown/grey sand - getting siltier	145	149
brown sand w/1" silt layers	149	150
dirty grey/brown sand w/wood	150	154
thin grey silt layers	154	155
silty grey/brown sand	155	170
grey silt w/clay layers	170	172'6"

Start Date 01/22/2014 Completed Date 02/28/2014

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

[x] Driller [ ] Engineer [ ] Trainee Name (Print) Driller - Darrell Feavel
Driller/Engineer/Trainee Signature _____
Driller or trainee License No. 2398

IF TRAINEE,
Driller's Licensed No. _____
Driller's Signature _____

Drilling Company Bison Well Drilling & Septic, LLC
Address PO Box 5142
City, State, Zip Spanaway, WA 98387
Contractor's Registration No. BISONWD945R9 Date 03/13/2014

Ecology is an Equal Opportunity Employer.

ECY 350-1-20 (Rev 3/05) **The Department of Ecology does NOT warranty the Data and/or Information on this Well Report.**

Washington State Department of Health
Environmental Health Programs
Division of Drinking Water

Ground Water Contamination
Susceptibility Assessment Survey Form

Complete **one** form for **each** ground water source (well, wellfield, spring) used in your water system (photocopy as necessary).

PART I: System Information

Well owner/manager: North Beach Water District/Bill Neal, General Manager

Water system name: North Beach Water District

County: Pacific

Water system ID number: 63000C Source number: S13

Well depth: 149 feet

Source name: Wiegardt Well No. 1

WA well identification tag number: B A F - 0 2 1

❑ Well not tagged

Number of connections: 3,200 Population served: 4,010

Township: 12 N Range: 11 W

Section: 33 ¼ ¼ Section: SW, NE

Latitude/longitude (if available): 46 29 11.66 / 124 02 25.13

How was latitude/longitude determined?

_____Global positioning device _____survey _____topographical map
__X__other: Air Photo

*Please refer the instructions for details and explanations of all questions in Parts II through V.

PART II: Well Construction and Source Information

1) Date well originally constructed: 09/23/2013 month/day/year

last reconstruction: ___/___/___month/day/year

❑ Information unavailable

2) Well driller: Bison Well Drilling & Septic, LLC

❑ Well driller unknown

3) Type of well: _X_ Drilled: ❑ rotary ❑ bored ☑ cable (percussion) ❑ Dug

___ other: ❑ spring(s) ❑ lateral collector (Ranney)

❑ driven ❑ jetted ❑ other:

4) Well report available ☑ Yes (attach copy to form) ❑ No

5) Average pumping rate: 150 (gallons/min)

Source of information Well Testing Report

If not documented, how was pumping rate determined?

❑ Pumping rate unknown

6) Is this source treated?

If so, what type of treatment:

❑ disinfection ☑ filtration ❑ carbon filter ❑ air stripper ❑ other

Purpose of treatment (describe materials to be removed or controlled by treatment):

Not currently treated, but will be treated to remove Arsenic and Hydrogen Sulfide

7) If source is chlorinated, is a chlorine residual maintained: ❑ Yes ☑ No

Residual level:_____ (At the point closest to the source.)

PART III: Hydrogeologic Information

1) Depth to top of open interval: [check one]

❑ <20 ft ❑ 20-50ft ❑ 50-100ft ☑ 100-200ft ❑ >200ft

❑ information unavailable

2) Depth to ground water (static water level):

☑ <20ft ❑ 20-50ft ❑ 50-100ft ❑ >100ft

❑ flowing well/spring (artesian)

How was water level determined?

☑ well log ❑ other _____

❑ depth to ground water unknown

3) If source is a flowing well or spring, what is the confining pressure:

_____ psi (pounds per square inch) **or**

_____feet above wellhead

4) If source is a flowing well or spring, is there a surface impoundment, reservoir, or catchment associated with this source: ❑ Yes ❑ No

5) Wellhead elevation (height above mean sea level): 20 feet

How was elevation determined? ☑ topographic map ❑ Drilling/Well Log ❑ altimeter

❑ other:_____

❑ information unavailable

6) Confining layers: (This can be completed only for those sources with a drilling log, well log or geologic report describing subsurface conditions. Please refer to assistance package for example.)

_____X_____ evidence of a confining layer in well log

_____ no evidence of a confining layer in well log

If there is evidence of a confining layer, is the depth to ground water more than 20 feet above the **bottom** of the **lowest confining layer**? ☑ Yes ❑ No

❑ information unavailable

7) Sanitary setback:

❑ < 100ft* ☑ 100-120ft ❑ 120-200 ft ❑ >200ft

* If less than 100ft, describe the site conditions:

_____

_____

_____

_____

8) Wellhead construction:

❑ wellhead enclosed in a wellhouse

☑ controlled access (describe): Pitless Well Adapter

❑ other uses for wellhouse (describe): _____

_____

❑ no wellhead control

9) Surface seal:

☑ 18 ft

❑ <18 ft (no Department of Ecology approval)

❑ <18 ft (Approved by Ecology, include documentation)

❑ depth of seal unknown

❑ no surface seal

10) Annual rainfall (inches per year):

❑ <10 in/yr ❑ 10-25 in/yr ☑ >25 in/yr

PART IV: Mapping Your Ground Water Resource

1) Annual volume of water pumped: 54,740,000 (gallons)

How was this determined?

❑ meter

☑ estimated: ❑ pumping rate (_____)

❑ pump capacity (_____)

☑ other: Annual water right limit for wellfield

2) "Calculated Fixed Radius" estimate of ground water movement:
(see Instruction Packet)

6-month ground water travel time: 514 feet

1-year ground water travel time: 728 feet

5-year ground water travel time: 1,627 feet

10-year ground water travel time: 2,301 feet

Information available on length of screened/open interval?

☑ Yes ❑ No

Length of screened/open interval: 20 feet

3) Is there a river, lake, pond, stream, or other obvious surface water body within the 6- month time of travel boundary?

☑Yes ❑No (mark and identify on map)

4) Is there a stormwater and/or wastewater facility, treatment lagoon, or holding pond located within the 6-month time of travel boundary?

❑ Yes ☑No (mark and identify on map)

Comments: There is a small un-named pond approximately 180 feet west of the well.

PART V: Assessment of Water Quality

1) **Regional sources of risk to ground water**:

Please indicate if any of the following are present within a circular area around your water source having a radius up to and including the five-year ground water travel time. If you do not know if one of the following is present, mark the "unknown" space.

	6-month	1-year	5-year	unknown
• likely pesticide application				
• stormwater injection wells				
• other injection wells				
• abandoned ground water well				X
• landfills, dumps, disposal areas				
• known hazardous materials clean-up site				
• water system(s) with known quality problems				
• population density >1 house/acre		X	X	
• residences commonly have septic tanks		X	X	
• wastewater treatment lagoons				
• sites used for land application of waste				

Mark and identify on map any of the risks listed above which are located within the 6-month time of travel boundary. (Please include a map of the wellhead and time of travel areas with this form. Please locate and mark any of the following.)

If other recorded or potential sources of ground water contamination exist within the ten-year time of travel circular zone around your water supply, please describe:

Six sites are identified on the Ecology Facilities Sites Map in the general vicinity of the wells. Of the six sites, three are within the 10-year ZOC and three are outside the 10-year ZOC. None are within the 5-year ZOC. Of the three sites identified within the 10-year ZOC, to are plumbing businesses with no contamination issue listed, and one is a foundation excavation project. Of the three sites identified outside the 10-year ZOC, one is a leaking underground storage tank identified in 1995, one is a permitted underground storage tank at the same location, and one is a drum site identified as a hazardous waste generator in 1993.

2) **Source-specific water quality records**: For each type of test below, **mark the row that applies to the sample results for this source**. Consider all the sample results from the past 12 years. (MCLs are noted next to the specific test or listed in assistance package.)

A. **Nitrate:** (Nitrate MCL = 10 mg/l)

Results greater than MCL	
<2 mg/liter nitrate	X
2-5 mg/liter nitrate	
<5 mg/liter nitrate	
Nitrate sampling records unavailable	

B. **VOCs:** (VOC detection level is 0.5 ug/l or 0.0005 mg/l)

Results greater than MCL or SAL	
VOCs detected at least once	
VOCs never detected	X
VOC sampling records unavailable	

C. **EDB/DBCP:**
(EDB MCL = 0.05 ug/l or 0.00005 mg/l. DBCP MCL = 0.2 ug/l or 0.0002 mg/l.)

EDB/DBCP detected below MCL at least once	
EDB/DBCP detected above MCL at least once	
EDB/DBCP never detected	X
EDB/DBCP tests required but not yet completed	
EDB/DBCP tests not required	

D. **Other SOCs (Pesticides):**

Other SOCs detected (pesticides and other synthetic organic chemicals)	
Other SOC tests performed but none detected (list test methods in comments)	X
Other SOC tests not performed	

If any SOCs in addition to EDB/DBCP were detected, please identify and date. If other SOC tests were performed, but no SOCs detected, list test methods here: EPA 531.2, 515.1, 525.2

E. **Bacterial contamination:**

Any bacterial detection(s) in the past 3 years in samples taken from the source (not distribution sampling records)? None

Has source (in past 3 years) had a bacteriological contamination problem found in distribution samples that was attributed to the source? _____

Source sampling records for bacteria unavailable _____

PART VI: Geographic or Hydrologic Factors Contributing to a Non-Circular Zone of Contribution

The following questions will help identify those ground water systems which may not be accurately represented by the calculated fixed radius (CFR) method described in Part IV. For these sources, the CFR areas should be used as a preliminary delineation of the critical time of travel zones for that source. As a system develops its Wellhead Protection Plan for these sources, a more detailed delineation method should be considered.

1) Is there evidence of obvious hydrologic boundaries within the 10-year time of travel zone of the CFR? (Does the largest circle extend over a stream, river, lake, up a steep hillside, and/or over a mountain or ridge?)

❑ Yes ☑ No

Describe with references to map produced in Part IV:

There is a small un-named seasonal pond approximately 180 feet west of the well. This pond is likely an expression of the same groundwater that the well accesses and probably not a hydrologic boundary.

2) Aquifer Material:

A) Does the drilling log, well log or other geologic/engineering reports identify that the well is located in an area where the underground conditions are identified as fractured rock and/or basalt terrain?

❑ Yes ☑ No

B) Does the drilling log, well log or other geologic/engineering reports indicate that the well is located in an area where the underground conditions are primarily identified as coarse sand and gravel?

❑ Yes ☑ No

3) Is the source located in an aquifer with a high horizontal flow rate? (These can include sources located on flood plains of large rivers, artesian wells with high water pressure, and/or shallow flowing wells and springs.)

❑ Yes ☑ No

4) Are there other high capacity wells (agricultural, municipal and/or industrial) located within the CFRs?

a) Presence of ground water extraction wells removing more than approximately 500 gal/min within…

	YES	NO	unknown
<6-month travel time		X	
6 month—1 year travel time		X	
1—5 year travel time		X	
5—10 year travel time		X	

b) Presence of ground water recharge wells (dry wells) or heavy irrigation within…

	YES	NO	unknown
<1-year travel time		X	
1—5 year travel time		X	
5—10 year travel time		X	

Please identify or describe additional hydrologic or geographic conditions that you believe may affect the shape of the zone of contribution for this source. Where possible, reference them to locations on the map produced in Part IV.

FORM COMPLETED BY:

Karl Johnson, PE — October 3, 2014
Print Name — Date

Signature

Washington State Department of Health
Environmental Health Programs
Division of Drinking Water

Ground Water Contamination
Susceptibility Assessment Survey Form

Complete **one** form for **each** ground water source (well, wellfield, spring) used in your water system (photocopy as necessary).

PART I: System Information

Well owner/manager: North Beach Water District/Bill Neal, General Manager

Water system name: North Beach Water District

County: Pacific

Water system ID number: 63000C Source number: S13

Well depth: 149 feet

Source name: Wiegardt Well No. 2

WA well identification tag number: B A F - 0 2 4

❑ Well not tagged

Number of connections: 3,200 Population served: 4,010

Township: 12 N Range: 11 W

Section: 33 ¼ ¼ Section: SW, NE

Latitude/longitude (if available): 46 29 11.66 / 124 02 25.13

How was latitude/longitude determined?

_____Global positioning device _____survey _____topographical map
__X__other: Air Photo

*Please refer the instructions for details and explanations of all questions in Parts II through V.

PART II: Well Construction and Source Information

1) Date well originally constructed: 01/21/2014 month/day/year

last reconstruction: ___/___/___month/day/year

❑ Information unavailable

2) Well driller: Bison Well Drilling & Septic, LLC

❑ Well driller unknown

3) Type of well: _X_ Drilled: ❑ rotary ❑ bored ☑ cable (percussion) ❑ Dug

___ other: ❑ spring(s) ❑ lateral collector (Ranney)

❑ driven ❑ jetted ❑ other:

4) Well report available ☑ Yes (attach copy to form) ❑ No

5) Average pumping rate: 150 (gallons/min)

Source of information Well Testing Report

If not documented, how was pumping rate determined?

❑ Pumping rate unknown

6) Is this source treated?

If so, what type of treatment:

❑ disinfection ☑ filtration ❑ carbon filter ❑ air stripper ❑ other

Purpose of treatment (describe materials to be removed or controlled by treatment):

Not currently treated, but will be treated to remove Arsenic and Hydrogen Sulfide

7) If source is chlorinated, is a chlorine residual maintained: ❑ Yes ☑ No

Residual level:_____ (At the point closest to the source.)

PART III: Hydrogeologic Information

1) Depth to top of open interval: [check one]

❑ <20 ft ❑ 20-50ft ❑ 50-100ft ☑ 100-200ft ❑ >200ft

❑ information unavailable

2) Depth to ground water (static water level):

☑ <20ft ❑ 20-50ft ❑ 50-100ft ❑ >100ft

❑ flowing well/spring (artesian)

How was water level determined?

☑ well log ❑ other _____

❑ depth to ground water unknown

3) If source is a flowing well or spring, what is the confining pressure:

_____ psi (pounds per square inch) **or**

_____feet above wellhead

4) If source is a flowing well or spring, is there a surface impoundment, reservoir, or catchment associated with this source: ❑ Yes ❑ No

5) Wellhead elevation (height above mean sea level): 20 feet

How was elevation determined? ☑ topographic map ❑ Drilling/Well Log ❑ altimeter

❑ other:_____

❑ information unavailable

6) Confining layers: (This can be completed only for those sources with a drilling log, well log or geologic report describing subsurface conditions. Please refer to assistance package for example.)

_____X_____ evidence of a confining layer in well log

_____ no evidence of a confining layer in well log

If there is evidence of a confining layer, is the depth to ground water more than 20 feet above the **bottom** of the **lowest confining layer**? ☑ Yes ❑ No

❑ information unavailable

7) Sanitary setback:

❑ < 100ft* ☑ 100-120ft ❑ 120-200 ft ❑ >200ft

* If less than 100ft, describe the site conditions:

_____

_____

_____

_____

8) Wellhead construction:

❑ wellhead enclosed in a wellhouse

☑ controlled access (describe): Pitless Well Adapter

❑ other uses for wellhouse (describe): _____

_____

❑ no wellhead control

9) Surface seal:

☑ 18 ft

❑ <18 ft (no Department of Ecology approval)

❑ <18 ft (Approved by Ecology, include documentation)

❑ depth of seal unknown

❑ no surface seal

10) Annual rainfall (inches per year):

❑ <10 in/yr ❑ 10-25 in/yr ☑ >25 in/yr

PART IV: Mapping Your Ground Water Resource

1) Annual volume of water pumped: 54,740,000 (gallons)

How was this determined?

❑ meter

☑ estimated: ❑ pumping rate (_____)

❑ pump capacity (_____)

☑ other: Annual water right limit for wellfield

2) "Calculated Fixed Radius" estimate of ground water movement:
(see Instruction Packet)

6-month ground water travel time: 514 feet

1-year ground water travel time: 728 feet

5-year ground water travel time: 1,627 feet

10-year ground water travel time: 2,301 feet

Information available on length of screened/open interval?

☑ Yes ❑ No

Length of screened/open interval: 21 feet

3) Is there a river, lake, pond, stream, or other obvious surface water body within the 6- month time of travel boundary?

☑Yes ❑No (mark and identify on map)

4) Is there a stormwater and/or wastewater facility, treatment lagoon, or holding pond located within the 6-month time of travel boundary?

❑ Yes ☑No (mark and identify on map)

Comments: There is a small un-named pond approximately 180 feet west of the well.

PART V: Assessment of Water Quality

1) **Regional sources of risk to ground water**:

Please indicate if any of the following are present within a circular area around your water source having a radius up to and including the five-year ground water travel time. If you do not know if one of the following is present, mark the "unknown" space.

	6-month	1-year	5-year	unknown
• likely pesticide application				
• stormwater injection wells				
• other injection wells				
• abandoned ground water well				X
• landfills, dumps, disposal areas				
• known hazardous materials clean-up site				
• water system(s) with known quality problems				
• population density >1 house/acre		X	X	
• residences commonly have septic tanks		X	X	
• wastewater treatment lagoons				
• sites used for land application of waste				

Mark and identify on map any of the risks listed above which are located within the 6-month time of travel boundary. (Please include a map of the wellhead and time of travel areas with this form. Please locate and mark any of the following.)

If other recorded or potential sources of ground water contamination exist within the ten-year time of travel circular zone around your water supply, please describe:

Six sites are identified on the Ecology Facilities Sites Map in the general vicinity of the wells. Of the six sites, three are within the 10-year ZOC and three are outside the 10-year ZOC. None are within the 5-year ZOC. Of the three sites identified within the 10-year ZOC, to are plumbing businesses with no contamination issue listed, and one is a foundation excavation project. Of the three sites identified outside the 10-year ZOC, one is a leaking underground storage tank identified in 1995, one is a permitted underground storage tank at the same location, and one is a drum site identified as a hazardous waste generator in 1993.

2) **Source-specific water quality records**: For each type of test below, **mark the row that applies to the sample results for this source**. Consider all the sample results from the past 12 years. (MCLs are noted next to the specific test or listed in assistance package.)

A. **Nitrate:** (Nitrate MCL = 10 mg/l)

Results greater than MCL	
<2 mg/liter nitrate	X
2-5 mg/liter nitrate	
<5 mg/liter nitrate	
Nitrate sampling records unavailable	

B. **VOCs:** (VOC detection level is 0.5 ug/l or 0.0005 mg/l)

Results greater than MCL or SAL	
VOCs detected at least once	
VOCs never detected	X
VOC sampling records unavailable	

C. **EDB/DBCP:**
(EDB MCL = 0.05 ug/l or 0.00005 mg/l. DBCP MCL = 0.2 ug/l or 0.0002 mg/l.)

EDB/DBCP detected below MCL at least once	
EDB/DBCP detected above MCL at least once	
EDB/DBCP never detected	X
EDB/DBCP tests required but not yet completed	
EDB/DBCP tests not required	

D. **Other SOCs (Pesticides):**

Other SOCs detected (pesticides and other synthetic organic chemicals)	
Other SOC tests performed but none detected (list test methods in comments)	X
Other SOC tests not performed	

If any SOCs in addition to EDB/DBCP were detected, please identify and date. If other SOC tests were performed, but no SOCs detected, list test methods here: EPA 531.2, 515.1, 525.2

E. **Bacterial contamination:**

Any bacterial detection(s) in the past 3 years in samples taken from the source (not distribution sampling records)? None

Has source (in past 3 years) had a bacteriological contamination problem found in distribution samples that was attributed to the source? _____

Source sampling records for bacteria unavailable _____

PART VI: Geographic or Hydrologic Factors Contributing to a Non-Circular Zone of Contribution

The following questions will help identify those ground water systems which may not be accurately represented by the calculated fixed radius (CFR) method described in Part IV. For these sources, the CFR areas should be used as a preliminary delineation of the critical time of travel zones for that source. As a system develops its Wellhead Protection Plan for these sources, a more detailed delineation method should be considered.

1) Is there evidence of obvious hydrologic boundaries within the 10-year time of travel zone of the CFR? (Does the largest circle extend over a stream, river, lake, up a steep hillside, and/or over a mountain or ridge?)

❑ Yes ☑ No

Describe with references to map produced in Part IV:

There is a small un-named seasonal pond approximately 180 feet west of the well. This pond is likely an expression of the same groundwater that the well accesses and probably not a hydrologic boundary.

2) Aquifer Material:

A) Does the drilling log, well log or other geologic/engineering reports identify that the well is located in an area where the underground conditions are identified as fractured rock and/or basalt terrain?

❑ Yes ☑ No

B) Does the drilling log, well log or other geologic/engineering reports indicate that the well is located in an area where the underground conditions are primarily identified as coarse sand and gravel?

❑ Yes ☑ No

3) Is the source located in an aquifer with a high horizontal flow rate? (These can include sources located on flood plains of large rivers, artesian wells with high water pressure, and/or shallow flowing wells and springs.)

❑ Yes ☑ No

4) Are there other high capacity wells (agricultural, municipal and/or industrial) located within the CFRs?

a) Presence of ground water extraction wells removing more than approximately 500 gal/min within…

	YES	NO	unknown
<6-month travel time		X	
6 month—1 year travel time		X	
1—5 year travel time		X	
5—10 year travel time		X	

b) Presence of ground water recharge wells (dry wells) or heavy irrigation within…

	YES	NO	unknown
<1-year travel time		X	
1—5 year travel time		X	
5—10 year travel time		X	

Please identify or describe additional hydrologic or geographic conditions that you believe may affect the shape of the zone of contribution for this source. Where possible, reference them to locations on the map produced in Part IV.

FORM COMPLETED BY:

Karl Johnson, PE — October 3, 2014
Print Name — Date

Signature

Washington State Department of Health
Environmental Health Programs
Division of Drinking Water

Ground Water Contamination
Susceptibility Assessment Survey Form

Complete **one** form for **each** ground water source (well, wellfield, spring) used in your water system (photocopy as necessary).

PART I: System Information

Well owner/manager: North Beach Water District/Bill Neal, General Manager

Water system name: North Beach Water District

County: Pacific

Water system ID number: 63000C Source number: S14

Well depth: 150 feet

Source name: Wiegardt Well No. 3

WA well identification tag number: B A F - 0 2 5

❑ Well not tagged

Number of connections: 3,200 Population served: 4,010

Township: 12 N Range: 11 W

Section: 33 ¼ ¼ Section: SW, NE

Latitude/longitude (if available): 46 29 11.66 / 124 02 25.13

How was latitude/longitude determined?

_____Global positioning device _____survey _____topographical map
__X__other: Air Photo

*Please refer the instructions for details and explanations of all questions in Parts II through V.

PART II: Well Construction and Source Information

1) Date well originally constructed: 03/13/2014 month/day/year

last reconstruction: ___/___/___month/day/year

❑ Information unavailable

2) Well driller: Bison Well Drilling & Septic, LLC

❑ Well driller unknown

3) Type of well: _X_ Drilled: ❑ rotary ❑ bored ☑ cable (percussion) ❑ Dug

___ other: ❑ spring(s) ❑ lateral collector (Ranney)

❑ driven ❑ jetted ❑ other:

4) Well report available ☑ Yes (attach copy to form) ❑ No

5) Average pumping rate: 150 (gallons/min)

Source of information Well Testing Report

If not documented, how was pumping rate determined?

❑ Pumping rate unknown

6) Is this source treated?

If so, what type of treatment:

❑ disinfection ☑ filtration ❑ carbon filter ❑ air stripper ❑ other

Purpose of treatment (describe materials to be removed or controlled by treatment):

Not currently treated, but will be treated to remove Arsenic and Hydrogen Sulfide

7) If source is chlorinated, is a chlorine residual maintained: ❑ Yes ☑ No

Residual level:_____ (At the point closest to the source.)

PART III: Hydrogeologic Information

1) Depth to top of open interval: [check one]

❑ <20 ft ❑ 20-50ft ❑ 50-100ft ☑ 100-200ft ❑ >200ft

❑ information unavailable

2) Depth to ground water (static water level):

☑ <20ft ❑ 20-50ft ❑ 50-100ft ❑ >100ft

❑ flowing well/spring (artesian)

How was water level determined?

☑ well log ❑ other _____

❑ depth to ground water unknown

3) If source is a flowing well or spring, what is the confining pressure:

_____ psi (pounds per square inch) **or**

_____feet above wellhead

4) If source is a flowing well or spring, is there a surface impoundment, reservoir, or catchment associated with this source: ❑ Yes ❑ No

5) Wellhead elevation (height above mean sea level): 22 feet

How was elevation determined? ☑ topographic map ❑ Drilling/Well Log ❑ altimeter

❑ other:_____

❑ information unavailable

6) Confining layers: (This can be completed only for those sources with a drilling log, well log or geologic report describing subsurface conditions. Please refer to assistance package for example.)

_____X_____ evidence of a confining layer in well log

_____ no evidence of a confining layer in well log

If there is evidence of a confining layer, is the depth to ground water more than 20 feet above the **bottom** of the **lowest confining layer**? ☑ Yes ❑ No

❑ information unavailable

7) Sanitary setback:

❑ < 100ft* ☑ 100-120ft ❑ 120-200 ft ❑ >200ft

* If less than 100ft, describe the site conditions:

_____

_____

_____

_____

8) Wellhead construction:

❑ wellhead enclosed in a wellhouse

☑ controlled access (describe): Pitless Well Adapter

_____

❑ other uses for wellhouse (describe): _____

_____

❑ no wellhead control

9) Surface seal:

☑ 18 ft

❑ <18 ft (no Department of Ecology approval)

❑ <18 ft (Approved by Ecology, include documentation)

❑ depth of seal unknown

❑ no surface seal

10) Annual rainfall (inches per year):

❑ <10 in/yr ❑ 10-25 in/yr ☑ >25 in/yr

PART IV: Mapping Your Ground Water Resource

1) Annual volume of water pumped: 54,740,000 (gallons)

How was this determined?

❑ meter

☑ estimated: ❑ pumping rate (_____)

❑ pump capacity (_____)

☑ other: Annual water right limit for wellfield

2) "Calculated Fixed Radius" estimate of ground water movement:
(see Instruction Packet)

6-month ground water travel time: 514 feet

1-year ground water travel time: 728 feet

5-year ground water travel time: 1,627 feet

10-year ground water travel time: 2,301 feet

Information available on length of screened/open interval?

☑ Yes ❑ No

Length of screened/open interval: 21 feet

3) Is there a river, lake, pond, stream, or other obvious surface water body within the 6-month time of travel boundary?

☑Yes ❑No (mark and identify on map)

4) Is there a stormwater and/or wastewater facility, treatment lagoon, or holding pond located within the 6-month time of travel boundary?

❑ Yes ☑No (mark and identify on map)

Comments: There is a small un-named pond approximately 180 feet west of the well.

PART V: Assessment of Water Quality

1) **Regional sources of risk to ground water**:

Please indicate if any of the following are present within a circular area around your water source having a radius up to and including the five-year ground water travel time. If you do not know if one of the following is present, mark the "unknown" space.

	6-month	1-year	5-year	unknown
• likely pesticide application				
• stormwater injection wells				
• other injection wells				
• abandoned ground water well				X
• landfills, dumps, disposal areas				
• known hazardous materials clean-up site				
• water system(s) with known quality problems				
• population density >1 house/acre		X	X	
• residences commonly have septic tanks		X	X	
• wastewater treatment lagoons				
• sites used for land application of waste				

Mark and identify on map any of the risks listed above which are located within the 6-month time of travel boundary. (Please include a map of the wellhead and time of travel areas with this form. Please locate and mark any of the following.)

If other recorded or potential sources of ground water contamination exist within the ten-year time of travel circular zone around your water supply, please describe:

Six sites are identified on the Ecology Facilities Sites Map in the general vicinity of the wells. Of the six sites, three are within the 10-year ZOC and three are outside the 10-year ZOC. None are within the 5-year ZOC. Of the three sites identified within the 10-year ZOC, to are plumbing businesses with no contamination issue listed, and one is a foundation excavation project. Of the three sites identified outside the 10-year ZOC, one is a leaking underground storage tank identified in 1995, one is a permitted underground storage tank at the same location, and one is a drum site identified as a hazardous waste generator in 1993.

2) **Source-specific water quality records**: For each type of test below, **mark the row that applies to the sample results for this source**. Consider all the sample results from the past 12 years. (MCLs are noted next to the specific test or listed in assistance package.)

A. **Nitrate:** (Nitrate MCL = 10 mg/l)

Results greater than MCL	
<2 mg/liter nitrate	X
2-5 mg/liter nitrate	
<5 mg/liter nitrate	
Nitrate sampling records unavailable	

B. **VOCs:** (VOC detection level is 0.5 ug/l or 0.0005 mg/l)

Results greater than MCL or SAL	
VOCs detected at least once	
VOCs never detected	X
VOC sampling records unavailable	

C. **EDB/DBCP:**
(EDB MCL = 0.05 ug/l or 0.00005 mg/l. DBCP MCL = 0.2 ug/l or 0.0002 mg/l.)

EDB/DBCP detected below MCL at least once	
EDB/DBCP detected above MCL at least once	
EDB/DBCP never detected	X
EDB/DBCP tests required but not yet completed	
EDB/DBCP tests not required	

D. **Other SOCs (Pesticides):**

Other SOCs detected (pesticides and other synthetic organic chemicals)	
Other SOC tests performed but none detected (list test methods in comments)	X
Other SOC tests not performed	

If any SOCs in addition to EDB/DBCP were detected, please identify and date. If other SOC tests were performed, but no SOCs detected, list test methods here: EPA 531.2, 515.1, 525.2

E. **Bacterial contamination:**

Any bacterial detection(s) in the past 3 years in samples taken from the source (not distribution sampling records)? None

Has source (in past 3 years) had a bacteriological contamination problem found in distribution samples that was attributed to the source? _____

Source sampling records for bacteria unavailable _____

PART VI: Geographic or Hydrologic Factors Contributing to a Non-Circular Zone of Contribution

The following questions will help identify those ground water systems which may not be accurately represented by the calculated fixed radius (CFR) method described in Part IV. For these sources, the CFR areas should be used as a preliminary delineation of the critical time of travel zones for that source. As a system develops its Wellhead Protection Plan for these sources, a more detailed delineation method should be considered.

1) Is there evidence of obvious hydrologic boundaries within the 10-year time of travel zone of the CFR? (Does the largest circle extend over a stream, river, lake, up a steep hillside, and/or over a mountain or ridge?)

❑ Yes ☑ No

Describe with references to map produced in Part IV:

There is a small un-named seasonal pond approximately 180 feet west of the well. This pond is likely an expression of the same groundwater that the well accesses and probably not a hydrologic boundary.

2) Aquifer Material:

A) Does the drilling log, well log or other geologic/engineering reports identify that the well is located in an area where the underground conditions are identified as fractured rock and/or basalt terrain?

❑ Yes ☑ No

B) Does the drilling log, well log or other geologic/engineering reports indicate that the well is located in an area where the underground conditions are primarily identified as coarse sand and gravel?

❑ Yes ☑ No

3) Is the source located in an aquifer with a high horizontal flow rate? (These can include sources located on flood plains of large rivers, artesian wells with high water pressure, and/or shallow flowing wells and springs.)

❑ Yes ☑ No

4) Are there other high capacity wells (agricultural, municipal and/or industrial) located within the CFRs?

a) Presence of ground water extraction wells removing more than approximately 500 gal/min within…

	YES	NO	unknown
<6-month travel time		X	
6 month—1 year travel time		X	
1—5 year travel time		X	
5—10 year travel time		X	

b) Presence of ground water recharge wells (dry wells) or heavy irrigation within…

	YES	NO	unknown
<1-year travel time		X	
1—5 year travel time		X	
5—10 year travel time		X	

Please identify or describe additional hydrologic or geographic conditions that you believe may affect the shape of the zone of contribution for this source. Where possible, reference them to locations on the map produced in Part IV.

FORM COMPLETED BY:

Karl Johnson, PE — October 3, 2014
Print Name — Date

Signature

APPENDIX D

NORTH BEACH WATER DISTRICT RULES AND REGULATIONS

Welcome To

North Beach Water District

RULES & REGULATIONS

ADOPTED BY RESOLUTION

12-2008

REVISED SEPTEMBER 16, 2013

Mission Statement

The mission of North Beach Water District is to provide high quality water for residential, commercial, industrial, and fire protection uses that meets or exceeds all local, state, and federal standards and to provide courteous and responsive service at the most reasonable cost to our customers.

These rules were adopted by the Board of Commissioners of North Beach Water District on July 7, 2008. Amendments to these rules are listed on the last page.

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY, WASHINGTON

RESOLUTION NO.12-2008

A RESOLUTION OF THE BOARD OF COMMISSIONERS OF NORTH BEACH WATER, PACIFIC COUNTY, WASHINGTON, ESTABLISHING SERVICE CHARGES, CONNECTION CHARGES AND SERVICE REGULATIONS.

WHEREAS, the Board of Commissioners is authorized by Title 57 RCW to establish service charges, connection charges and service regulations; and

WHEREAS, during the initial operation of the water systems by the District, the Board of Commissioners desires to adopt the service charges, connection charges and service regulations currently established by the North Beach Public Development Authority for the water systems serving the District; now, therefore

BE IT RESOLVED by the Board of Commissioners of the North Beach Water District, Pacific County, Washington as follows:

(*See Rules on Subsequent Pages*)

ADOPTED by the Board of Commissioners of North Beach Water District, Pacific County, Washington, at a special meeting held on July 7, 2008.

Section 1. The following rules, regulations and rates shall be established for the District's operation of the water systems serving the District:

Sections:

1.01.000 Rules Established

These rules are adopted for the regulation of water service by the District.

1.01.010 Purpose

The following rates and regulations are established for the control of the water supply system of the District.

1.01.020 Definitions

For purposes of this resolution, the words or phrases defined below shall have the following meanings:

A. "District" means the District, or as indicated by the context, may mean the District, District General Manager, District engineer, or other District employee or agent representing the District in the discharge of his or her duties.

B. "District engineer" means the engineer designated by the District. Any act in this resolution required or authorized to be done by the District engineer may be done on behalf of the District engineer by an authorized District employee or an independent consulting engineer hired by the District.

C. "Board" means the Board of Commissioners of the North Beach Water District.

D. "Mains" means water lines designed or used to serve more than one premises.

E. "Manager" means the General Manager of the District. Any act in this resolution required or authorized to be done by the Manager may be done on behalf of the Manager by an authorized employee of the District.

F. "Person," "customer," "owner," "occupant," or "agent," shall be held to include natural persons of either sex, associations, co-partnerships, governmental agencies, and corporations whether acting by themselves or by a servant, agent or employee; the singular number shall be held to include the plural and the masculine pronoun to include the feminine.

G. "Premises" means a continuous tract of land, building or group of adjacent buildings under a single control with respect to use of water and responsibility for payment therefore. Subdivisions of such use or responsibility shall constitute a division into separate premises as defined in this section.

H. "Service connection" means that portion of the District water supply system connecting the supply system on a premise to the District water distribution main including the tap into the main, the water meter and appurtenances and the service line from the main to the meter and from the meter to the property line. Service connections include connections for fire protection as well as for domestic, commercial and industrial uses.

I. "Standard or permanent mains" means mains conforming to the standard specifications of the District with respect to materials and minimum diameter.

J. "Standard specifications" means those standard specifications for public works construction which have been adopted by the District board.

K. "Substandard or temporary mains" means mains which do not conform to the standard specifications of the District with respect to materials and/or minimum diameter.

1.01.030 Rules for administration and enforcement--copy filing--noncompliance

The Board shall have the power to adopt rules, and the Manager shall enforce and carry out, rules and regulations not inconsistent with the terms of this resolution for carrying out and enforcing the payment, collection, and remittance of the rates defined in this resolution, and the rules and regulations affecting the operation of the water system as such relate to

services, connections, and the general operation of the District. A copy of such rules and regulations shall be on file and available for public examination at the office of the District or at such other place or places as may be designated by the board. Failure to comply with any such rules and regulations shall be deemed a violation of this resolution.

1.01.040 Comprehensive water system plan--Contents

The Board may retain, or contract with a District engineer to prepare a comprehensive plan for the District water supply and distribution system and to recommend to the Board the standards for development and improvement of the system to provide adequate water supply for domestic and industrial consumption and fire protection. The comprehensive plan shall be on file at the District office and shall include:

A. Main sizes required on all existing streets; and

B. Main sizes and approximate locations for future major distribution mains in areas in which public streets do not presently exist; and

The location and construction standards for all waterworks facilities including, but not limited to, mains and appurtenances, reservoirs, and pump stations; and

C. All information required to be included in the comprehensive plan by State Statute and Federal, State, and local regulatory agencies; and

D. Such other information as may be deemed necessary by the District engineer or the Board.

1.01.050 Application for new service or transfer of service

All applications for water service connections to and/or the use of water within any premises shall be made at the District office or at such other place or places as the Board may designate. Every such application shall be made by the owner of the property to be furnished, or by his authorized agent, and the applicant shall state fully and truly all the purposes for which the water may be required, and must agree in writing to conform to the regulations and rules established from time to time as the condition for the use of the water. The applicant must further in writing agree as a condition precedent in the premises that the District shall have the right at any time, without notice, to shut off the water supply for repairs, extensions, nonpayment of rates, or for any other reason, and that the District shall not be responsible for any damage caused by the breaking, bursting, or collapsing of any boilers, pipes or fixtures, or by the stoppage, or interruption of the water supply, or any damage whatever resulting directly or indirectly from the District providing water service. The customer is responsible for any and all plumbing beyond the water meter. The applicant shall pay a fee for application for new service or transfer of service as specified in Section 1.01.390.

1.01.060 Use of water for purposes stated in application

It is prohibited for any person supplied with water from the District's water supply system

to use the water for purposes other than those named in the application upon which rates for water are based, or for any other purposes than that for which the application provides, or to use it in violation of any provision of this resolution.

1.01.070 Waste of water prohibited *(June 20, 2011)*

It is prohibited for any person to waste water or allow it to be wasted. Waste of water is defined as: applying water to a landscape in sufficient quantity to cause significant runoff of that water to impervious areas or to allow significant overspray onto non-landscaped areas; applying water to a landscape in sufficient quantity to cause substantial puddling of that water at the ground surface; allowing leaking valves, pipes, closets, faucets, or other fixtures; or allowing any pipes or faucets to run open to prevent the service from freezing or for any other reason. Customers may, during emergencies and to prevent property damage, take measures inconsistent with this section to resolve the emergency provided; they take all reasonable measures to resolve the emergency within 48 hours.

1.01.75 Responsibility for repair of service pipe *(June 20, 2011)*

A. The service pipe from the meter box extending into the customer's property, including pipes or plumbing inside buildings, belongs to the customer and it is the customer's responsibility to maintain, repair, and or replace those pipes**.** The service pipe, meters, meter setters, meter box, or valves located in the meter box and extending back to the main belongs to the District and it is the District's responsibility to maintain those pipes, meters, meter setter, meter box, and valves. The customer will not in any way render the meter box inaccessible to District personnel. The property owner assumes all responsibility on their premises for water furnished by the District. All service pipes, fittings, and equipment belonging to the customer must be kept in good repair and protected from freezing at the property owner's expense.

B. The District has no obligation to notify customers of a suspected leak on their premises. To provide excellent customer service and promote good relations between the District and its customers, District personnel will notify customers of any suspected leak on their premises. The District assumes no responsibility for any expenses incurred by the customer in determining if a leak is present.

In the event customers are notified of or become aware of water waste as defined in Section 1.01.070, they shall repair or remedy the waste of water within 48 hours. Failure to do so shall be a violation of this section and Section 1.01.070. The District has the authority to terminate that customer's water service without notice until waste of water is corrected.

C. In the case of a leak in the service pipe, the customer may be entitled to an adjustment on their water bill provided that an adjustment may be requested upon written application within a fourteen (14) day period of receipt of the billing in question. Failure to take plumbing system winterization precautions or repair a leak in a timely manner (48 hours) may constitute a forfeiture of the leak adjustment. After the complete and

satisfactory repairs and with documentation of satisfactory repair, reduction in fees shall be limited to one-half of the excess water usage billing as determined by the District to be associated with the billing period in question, and excludes the monthly service charge. The adjusted rate for the month in which the leak was detected shall be equal to the average of the water charges of the three-month period consisting of the same month from the previous year as the month the leak was discovered, and the month before and after the previous year. Said three-month average shall be the adjusted rate for the month in which the leak was detected. A leak adjustment shall be available to the customer once every five years.

1.01.080 Damaging or interfering with water system prohibited

A. It is prohibited for any person to willfully disturb, break, deface, or damage any fire hydrant, water meter, gate valve, water pipe or other waterworks appurtenance together with the buildings, grounds, and improvements thereon belonging to or connected with the water system of the District in any manner whatsoever.

B. It is prohibited for any person to open, close, turn or interfere with, or attempt to, or to connect with any fire hydrant, valve, or pipe belonging to the District unless authorized by the Manager in writing; provided, that this rule shall not apply to members of the Fire District or such other fire department duly authorized to operate fire hydrants while acting in such capacity.

C. It is prohibited for any person to deposit, or allow to be deposited, refuse or any substance into any District reservoir or to deposit, or allow to be deposited any deleterious matter in or upon any part of the District's watershed or water supply system.

1.01.090 Sprinkling during fires prohibited

It is prohibited for any person to knowingly use water for a lawn or garden sprinkling or irrigating purposes on any premises during the progress of a fire or conflagration within the District water system.

1.01.100 Cross-connections prohibited

A. All cross-connections between any private water supply and the water supply of the District, as that term is defined in the current WAC 248-54-480, whether or not such cross-connections are controlled by automatic devices, such as check valves, or by hand-operated mechanisms, such as gate valves or stopcocks, are prohibited. In addition to any penalties provided by this resolution, failure on the part of persons, firms, or corporations to discontinue the use of any and all cross-connections and to physically separate such cross-connections will be sufficient cause for the discontinuance of the public water service to the premises on which the cross-connection exists. It is further unlawful to maintain any plumbing or arrangement or interconnection whereby, in the judgment of the Manager, the District water supply system either on or off the premises may be contaminated.

B. The Manager shall make periodic inspections of premises served by the water supply

system to check for the presence of cross-connections. Any cross-connections found in such inspection shall be ordered removed by the Manager. If any immediate hazard to health is caused by the cross-connection, water services to the premises shall immediately be discontinued until it is verified that the cross-connection has been removed. This section does not apply to the interconnection of the District water supply system with the water supply system of another public water system where approved by the Board.

C. Backflow prevention devices, approved by the Manager, shall be installed at the service connection or within any premises where, in the judgment of the Manager, the nature and extent of activities on the premises, or the materials used in connection with the activities, or materials stored on the premises would present an immediate or dangerous hazard to health should a cross-connection occur, even though such cross-connection does not exist at the time the backflow device is required to be installed. A backflow prevention device shall be installed at the following facilities unless the Manager determines no hazard exists:

1. Hospitals, mortuaries, clinics;

2. Laboratories;

3. Piers and docks;

4. Sewage treatment plants;

5. Food or beverage processing plants;

6. Chemical plants using a water process;

7. Metal plating industries;

8. Petroleum processing or storage plants;

9. Radioactive material processing plants or nuclear reactors.

10.1.01.110 Use of nonconforming connection material prohibited

It is unlawful for any person to use any material not conforming to the standard specifications and the regulations of the District to connect any premises or buildings with the District water system.

1.01.120 Emergency interruption of service

In case of an emergency, or whenever the public health, safety, or equitable distribution of water so demands, the Manager may reduce or limit the time for or temporarily discontinue the use of water. Water service may be temporarily discontinued for purposes of making repairs, extensions, or doing other necessary work. Before so changing, reducing, limiting, or discontinuing the use of water, the District shall notify, insofar as practicable, all water

consumers affected. The District shall not be responsible for any damage resulting from interruption, change, or failure of the water supply.

1.01.130 Displacement of waterworks appurtenances

All persons, contractors, corporations, and municipalities performing construction work in streets or utility rights-of-way, such as grading, regrading, filling, trenching, or paving shall give the Manager thirty days' written notice in case it becomes necessary during the work to remove, displace, or change any water mains, pipes, fittings, meters, valves, or other waterworks appurtenances that may interfere with the prosecution of such work. Damage to any part of the water system shall make such person, contractor, corporation, or municipality liable to the District for the cost of necessary repairs and replacements.

1.01.140 Access to premises for inspection

Consistent with statutes and case authority, authorized employees of the District, properly identified, shall have free access at reasonable hours of the day, to all parts or premises or within buildings thereon to which water is supplied from the District water system for the purpose of checking conformity to these regulations. In addition, such personnel are authorized, from time to time, to survey water customers as a means to update customer lists and status in a responsible and reasonable manner. Whenever the owner or occupant of any premises supplied by the District water system restrains authorized District employees from making the necessary inspections and surveys, water service may be immediately discontinued to the premises.

1.01.150 District employees to work on mains and service connections

Only employees of the District or qualified contractors duly authorized by the Manager or the District engineer shall be allowed to do any work in connection with the District mains or service connections.

1.01.160 Mains and services--Location from sanitary sewers

All mains, service lines and other waterworks appurtenances which carry water shall be located a sufficient distance, both horizontally and vertically, from any sanitary sewer to prevent contamination, and shall meet or exceed any Federal, State, or local separation requirements, and all locations of waterworks facilities, both public and private, which are connected to the District water system are subject to the approval of the District engineer.

1.01.170 Ownerships of mains and service connections

The ownership of all mains, service connections, and appurtenances in public streets or utility rights-of-way shall be vested solely in the District, and the person responsible for the construction of such mains shall relinquish, by bill of sale, all interest in the ownership of such mains upon acceptance by the District; provided, that all private systems existing on April 1, 2006, shall remain under private ownership unless dedicated to the District under

the provisions of this resolution. The District will operate and maintain all approved and accepted mains in public streets or utility rights-of-way. In no case shall an owner, agent, officer or employee of any premises have the right to remove or change any part thereof without the approval of the Manager.

1.01.180 Private distribution systems to conform to District standards

A. All private water distribution systems in order to become or remain eligible for water to be furnished by the District must be constructed to the District's minimum standards, subject to approval by the District's engineer. All new construction and repairs shall conform to such standards. Failure to bring any existing system up to such standards within twelve months of written notice of defects to the owner of any such system shall result in termination of water service until corrections are made.

B. The owner(s) of any private water distribution system connected to the water supply system of the District may petition the Board to accept ownership and maintenance of the system provided the system meets District standards or satisfactory arrangements have been made to bring the system up to standards within twelve months. Included with such petition shall be such records of the system as necessary to indicate location, size, material and date of installation of all mains and appurtenances. Prior to acceptance by the District, a valid deed or bill of sale and all necessary easements and/or franchises must be presented to the District.

C. Nothing contained herein shall be construed to require the Board to accept ownership to any private distribution system.

1.01.190 Service connections--General requirements

A. Except as provided in Sections 1.01.200, 1.01.210 and 1.01.250, no premises shall hereinafter be connected to the water supply system of the District unless there is an adjacent standard main under the ownership and exclusive control of the District. The District reserves the right to refuse to connect any premises if the District determines that it lacks sufficient facilities or water to provide service to such premises.

B. When a permit has been obtained for the installation of water service, the Manager shall cause the premises described in the application to be connected with the water system by a service pipe extending at right angles from the main to the property line, and including a stopcock and water meter placed within the rights-of-way, which connection shall thereafter be maintained by and kept within the exclusive control of the District.

C. Except as provided in Section 1.01.210, every separate premises supplied by District water must have its own separate meter and the premises so supplied will not be allowed to supply water to any other premises. The District engineer may require individual buildings on any premises to be separately metered.

D. When two or more buildings on the same premises are being served unsatisfactorily by one water service connection, the Manager shall have the right to require the installation of additional water service connections from the water main to the premises already served. When additional water service connections are provided for any premises, all

water service to such premises shall be metered and installed in the regular manner.

E. Service connections shall be installed at the expense of the property owner, the same to be installed by the District and the cost to the District charged therefore. The property owner in applying for service shall pay to the District the then prevailing cost to cover the expense for the installation as outlined in Section 1.01.390. All services shall be constructed by the District from the main to the property line and shall include a suitable water meter and appurtenances. This rule shall also apply where exchanges in size of service are made at the request of the property owner. In case of replacement or new services, no service smaller than three-fourths inch shall be installed.

F. All persons connecting to District service shall be required to use only materials conforming to the standard specifications and regulations of the District. Plumbing on premises shall conform to the current Uniform Plumbing Code.

G. Before water will be turned on to the premises connected to District mains, the service pipes must be so located that the supply for each separate building shall be controlled by a separate stop and waste cock of standard make with extension handle, approved by the Manager, properly protected from the frost and so placed within the premises that all service pipes and fixtures may be thoroughly drained to prevent damage from freezing. All pipes placed underground outside buildings shall be installed at least two feet below finished grade. The connection between the District's pipes at the property line and the service pipes on the premises shall be made with a union.

H. When necessary due to the grading or regrading of public streets, the Manager may relocate services on the premises to conform to the grade or slope occasioned by the street grading, and charge the expense to the owner of the service.

1.01.200 Temporary service connections

Water service may be supplied to a premises on a temporary basis during the construction of a building on the premises or during the construction of a standard main to serve the premises as long as it meets requirements for adequate backflow prevention. Application for temporary service shall only be approved upon payment of all fees required by this resolution. This application shall state fully the purposes for which water is desired, the circumstances which require service by temporary means, and the duration for which temporary service is necessary. All costs necessary to install and remove the temporary service shall be paid by the applicant. Upon completion of the work for which the temporary service was necessary, the owner shall immediately apply for permanent service to the premises and the temporary service shall be removed. Failure to obtain permanent service shall be cause for immediate discontinuance of water supply to the premises.

1.01.210 Service connection-Wholesale consumers

A. 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. Where communities or a group of individuals are granted service through a common meter, such meter shall be furnished, installed,

maintained, and kept within the exclusive control of the District. The cost of the installation including the meter shall be at the expense of the consumer.

B. Where water service is supplied through a master meter, a company, association, or other form of organization, which is acceptable to the District, shall be responsible for the rates and charges set forth in this resolution.

C. Applications for water service under the provisions of this section shall be made on the forms furnished for that purpose. The application shall include a detailed description of the premises to be served, the name and nature of the organization which is to be responsible for the service charges, the conditions or circumstances precluding service by individual meters and such other information as the board may deem necessary.

D. Such consumers shall file with the District detailed plans of their systems in such form as specified by the District engineer. Each such consumer shall, prior to commencement of work, submit for the approval of the District engineer similar information with respect to all construction or modifications which add to, reduce, or alter the water system.

E. Water service, under the terms of this section, shall be limited to those premises described in the application. Service to additional premises, not included in the original application shall require a separate application and approval.

F. The ownership of the water system beyond the common meter shall be vested in the consumer and the operation, repair, expansion and renewal of the system shall be the responsibility of the consumer. The District's responsibility shall terminate with the common meter.

G. Any violation of the procedures required by this section shall be cause for immediate discontinuance of service to the system by the District.

1.01.220 Service agreements with other governmental units

The Board may, at its discretion, enter into an agreement with any other municipal corporation, or governmental unit, or legal entity for the purpose of obtaining or providing any service relating to water supply as provided by law. Terms of such agreements shall be established by the board for each agreement.

1.01.230 Connection charge

Each parcel of property to be served by the water supply system shall be charged a connection charge based on its proportionate share of the cost of construction of a standard main in the street or streets abutting the property. Prior to approval of an application for water service, the District engineer shall ascertain if the property in question has previously contributed its proportionate share of such construction costs. If the connection charge has not previously been satisfied, the applicant shall pay this charge as provided in Section 1.01.390 prior to the approval of the application for water service.

1.01.240 Low-Income Connection Charge Installment Payments *(June 21, 2010)*

Low-income property owners may apply for payment of connection charges in installments in accordance with the terms and conditions of this Section and any form installment

payment agreement approved by the District. The District's participation in the installment payment program shall be capped at $25,000 for all participants and contracts in total, commencing on effective date of the resolution that adopts this Section. The contract shall be for a maximum of $3,000 per connection, and shall require a minimum of 20% of the total amount financed as a down payment. "Low-income" means "combined disposable income" as defined in RCW 84.36.383, of less than $40,000.00. The installment payment program shall authorize the low-income property owner to pay the following charges and costs in installments: installation costs under Section 1.01.190(e); if applicable, connection charges under Section 1.01.230; if applicable, water main installation charges under Section 1.01.260 and Section 1.01.270; water system connection charges under Section 1.01.350; and any interest. The contract shall be for period not to exceed 5 (five) years, payable in equal monthly installments, with interest at a rate equal to the District's rate of interest on its investments in Washington State's Local Government Investment Pool (LGIP) at the time of execution of the contract. The contract shall be a covenant running with the land and shall be binding on successors. The contract shall provide that the unpaid balance of the charges, penalties, accrued interest and District collection and foreclosure costs shall be a lien upon the property, superior to all liens and encumbrances, except liens for general taxes and special assessments, and that the District shall enforce the lien by foreclosure in accordance with RCW 57.08.081. The contract shall be recorded in the office of the Pacific County Auditor at the expense of the property owner, and upon payment in full, the District shall record a release of the lien. The contract shall further provide that in the event of delinquency in payment of an installment payment, the Manager may disconnect temporarily the District's water service from and refuse to supply water to the property until the entire amount due and owing is paid in full. This remedy to be concurrent with and in addition to the District's right to foreclosure of the lien This section, and the contract authorized in this section, shall not prevent the District, as part of a street improvement program, from replacing any existing mains with new mains of any size to prevent future street destruction for water main repairs, and such replacement may be made without cost to the abutting property owner or upon such apportionment of cost as the Board of Commissioners shall deem reasonable.

1.01.250 Use of substandard mains

A. No substandard or temporary mains shall hereinafter be installed and connected to the District water supply system. Existing substandard mains may be extended to serve additional customers provided the design capacity of such main is not exceeded and provided the main is under the ownership of the District. The design capacity shall be determined by the District engineer.

B. At the time of application for the extension of a substandard main or connection to an existing substandard main, the owner of each property to be connected thereto shall pay to the District a connection charge as prescribed in Section 1.01.270 per front foot of property being served by such connection together with the costs and fees provided for water service connections; provided, that property for which a connection charge has

previously been paid for the installation of mains or property that has contributed its pro rata share of the cost of otherwise installing a main shall be exempt from the front foot payment. The connection charge paid to the District shall be retained by the District and shall be deposited in the water main customer's reserve fund, to be dispersed as hereafter provided by the Board. The property immediately abutting the connection shall be credited with the payment. Upon installation of standard mains, the sum retained by the District in the water main customer's reserve fund shall be applied to the payment thereof for the benefit of the property. If the front foot payment previously made is greater than the charge required, the residue shall be paid to the then record owner of the property without interest; however, if the charge is greater than the front foot payment previously made, then the property shall be liable for any deficiency. Whenever a standard main shall be constructed by the property owner under the direction and supervision of the District, the District shall pay toward the cost of the project, out of the charges paid pursuant hereto and from the water main customer's reserve fund, the front foot payment previously made for each parcel of land abutting a connection

1.01.260 Service connection--No main in street *(January 19, 2010)*

A. Whenever an applicant requests water service to premises with no main in the adjacent street, a standard main must be installed as a prerequisite to connection to the District water supply system. The standard main must conform to the comprehensive plan of the District water system and must be installed along the complete street frontage of the premises to be served in accordance with the comprehensive plan.

B. Applicant may enter into a mainline extension agreement as follows:

1. Owner shall construct at his own expense the water facility extension as per plan attached hereto, marked Exhibit A and incorporated herein by reference as though fully set forth. Said facility shall be constructed by the District or in accordance with the Rules and Regulations of said District in effect governing the construction and specifications for facilities of such type, and subject to the approval of the District's General Manager or his agent. Connection to the District's system is conditioned upon payment by the Owner to the District of all the District's costs associated with such extension including, but not limited to, the District's construction, restoration, engineering, legal and administrative costs.

2. For a period of 15 (fifteen) years from date hereof, any person, firm, or corporation owning real estate and not contributing to the original cost of such facility, who subsequently connects into or uses the same, shall pay a fair pro rata share of the cost of construction of said facility in accordance with the schedule set forth in Exhibit B which is attached hereto and incorporated herein by reference as though fully set forth. The Owner is required every two years from the date this contract is executed to provide the District with information regarding the current contact name, address, and telephone number of the person, company or partnership that originally entered

into the contract. If the property Owner fails to comply with the notification requirements of this subsection within sixty days of the specified time, then the District may collect any reimbursement funds owed to the property Owner under the contract. Such funds must be deposited in the capital fund of the District. (RCW 57.22.020)

3. Upon completion of construction of the extension and its acceptance by the General Manager of the District, the facility shall become a part of the District's water system without cost to the District. Maintenance and operation costs of said lines and facilities after acceptance shall be borne by the said District.

4. No person, firm, or corporation shall be granted a permit or be authorized by the District to connect into or use any such facility, or extensions thereof, during the period of time prescribed in paragraph (2) of this contract without first paying to the District, in addition to any and all other costs and charges made and assessed for such connection or use, the amount required by the provisions of the contract under which the facility so connected onto or used or constructed, as set forth in Exhibit B. All amounts so received by the municipality shall be remitted to the Owner or assignee within sixty (60) days after the receipt thereof.

5. Whenever any connection is made onto the facility described in Exhibit A under this contract without such payment having first been made in accordance with Exhibit B, the District may remove or cause to be removed, such unauthorized connection and all connecting lines or pipe located in the facility right of way, and dispose of such material removed without any liability whatsoever.

6. Owner hereunder is an independent contractor and not an agent or employee of the District.

7. Owner agrees to pay to the District an administrative fee of five percent (5%) of all reimbursements collected by the District on behalf of the Owner.

1.01.270 Facility Charges

1. Local Facility Charges. Property owners seeking to connect to the District's water system to serve real property abutting or adjacent to local water facilities for which the property owner has not paid an equitable share of the cost of such facilities by either the (a) installation of such facilities by developer extension agreement (b) payment of a latecomer reimbursement obligation (c) or participation in a Utility Local Improvement District (ULID) which install such facilities, shall pay the following local facility charge in addition to other general facility charges, meter installation charges, and special facility connection charges:

A. Local Facility Charge as outlined in Section 1.01.390 – Service Charges
The Charge is based on a per lineal foot for frontage on the water main of the real property to be served; provided a minimum of fifty (50) feet shall be utilized for the

purposes of calculating the local facility charge owing for lots with front footage on the main of less than fifty (50) feet.

B. Local Facility charge as established in a Customer Generated Infrastructure Agreement. The District will set a specific Local Facility Charge for real property who enter into an agreement with the District for a water main extension. A "Notice of Local Facility Charge" will be recorded on all real property as a part of the Customer Generated Infrastructure Agreement.

2. **General Facility Charge.** Properties seeking to connect to or increase service from the District's water system to service real property shall pay an equitable share of the cost of District's water system infrastructure. General Facility Charges are outlined in Section 1.01.390 Service Charges.

When an existing customer requests an upsized service they will be charged the difference between the current General Facility Charge for their existing service and the current General Facility Charge for the requested service size. (*Example: customer requests their 1-inch service be increased to a 2-inch service 1-inch GFC is $100. 2-inch GFC is $200. Customer pays $100 GFC for upsized service*). There will be no refund for downsizing a service.

1.01.280 All services to be metered

All service connections to the District water system shall be metered and all meters shall remain the property of the District and any meter may be exchanged with another meter of similar kind as deemed necessary by the Manager.

1.01.290 Turning on water

Whenever the owner or occupant of any premises connected with the District's water supply system desires to use water, he shall notify the Manager and request that the water be turned onto the premises. The owner shall leave his portion of a new service exposed in the trench until the water is turned on by the Manager, when he shall immediately properly cover the pipe.

1.01.300 Permission required to connect or turn water on or off

No plumber or other person will be allowed to make connection with the District mains or make connection with any conduit, pipes, or any fixtures connected therewith, or to connect pipes that have been disconnected, or to turn water on or off of premises without the written permission of the Manager.

1.01.310 Notice required to have water discontinued

Should an owner or occupant desire to discontinue the use of water supplied to any premises, notice must be given to the Manager. The water will then be turned off and turned

on again on application during normal business hours at the charges specified in Section 1.01.390(1). In accordance with RCW 57.08.005(3) all customers connected to the District's system will be charged the "Monthly Service Charge" specified in Section 1.01.390 regardless of whether their water is on or discontinued.

1.01.311 Notice required to have water permanently disconnected

An owner may permanently disconnect their water service by bringing their account to current, submitting an application and payment of the disconnect fee identified in Section 1.01.390. Once the account is current and the application and fee have been received by the District, the District will permanently remove the water service and all appurtenances from the premises. The customer will no longer be charged any fees specified in Section 1.01.390 and will be removed from North Beach Water District's customer list. Customer records will be retained for a minimum of 7 years in accordance with state law.

In the event the current or future property owner wants water service reestablished for the premises, application must be made in accordance with Section 1.01.050 "Application for new service or transfer of service". If at that time water service for the premises is available, the application will be approved. Water service will be provided, in a timely manner, to the premises when all fees and charges identified in Section 1.01.390 "Service Charges" have been paid.

1.01.320 Service reconnection or transfer of service

When new buildings are to be erected on the site of the old ones, and it is desired to increase the size of or change the location of the old service connection, or where a service connection to any premises is abandoned or no longer used, the Manager may cut out or remove such service connection after which, should a service connection be required for the premises, a new service shall be placed only upon the owner's making an application and paying for a new tap in the regular manner. When the service connection of any premises does not come from a main in front of the premises, the Manager shall, when a main is laid in front of the premises, after notifying the owner or tenant thereof, transfer the service connection to the new main without charge, and at the same time cut out the old service connection.

1.01.330 Meter tampering fee

Should the owner or occupant of the premises turn on the water or suffer or cause it to be turned on after it has been shut off at the curb cock by the District, or damage the meter or service, it may be turned off by the Manager, and an additional charge as set forth in Section 1.01.390 of this resolution made for the expense of turning it off and on, or making repair.

1.01.340 Charges to become lien

The District shall have a lien against premises to which water has been furnished, which lien shall be in the amount and to the extent allowed by RCW 57.08.081 as the same now exists

or may hereafter be amended. The lien shall be enforced in the manner allowed by RCW 57.08.081 as it now exists or may hereafter be amended.

1.01.350 Water Meter Rates

A. **Monthly Charges.** The schedule of monthly charges are set forth in Section 1.01.390 of this resolution. Monthly charges for meter sizes not listed in the schedule shall correspond to the next larger meter/service size listed.
B. **Rates for Wholesale Consumers.** The Board may establish rates for wholesale customers as authorized under the provisions of Section 1.01.210 of these rules for industrial, manufacturing, commercial, or other such customers, using in excess of one million cubic feet of water per year.

Fire Flow Rate. All buildings with a special fire service connected with the District water distribution system shall pay the Fire Flow Rate based on pipe size as substituted for equal meter size in the rate schedule found in Section 1.01.390. All fire service connection shall be monitored by an approved alarm company and all alarms shall be reported to the District. No water shall be used through such connections or sprinkler systems except for actual fire control. If the consumer is found using water through unmetered special fire or sprinkling service connection for other than fire protection, then each such connection of three inches or over shall be equipped with a detector check type of meter, and those connections under three inches shall be equipped with a conventional type of meter.

1.01.360 Water for construction purposes

Any owner, agent, or contractor intending to use water in the course of the construction of any building or of any street or utility shall apply to the District on forms provided for that purpose. Water for construction purposes shall be furnished only upon application and will be charged for at the rate as set forth in Section 1.01.390 of this resolution for consumption, the same to be billed at the time of return of meter; and all delinquent and unpaid charges therefore shall become a lien upon the premises supplied and shall be collected in the same manner as other delinquent and unpaid charges.

1.01.370 Cash deposit for water service

New consumers may be required to make a cash deposit with the District, based upon the estimate of the three months average water usage and service fees, based upon meter size through the meter as set forth in Section 1.01.390 of this resolution. The deposit does not incur interest Said deposit shall be refunded to the customer as a credit on the water bill(s) if the customer, for a period of two years, keeps their account in good standing without delinquency notification. In the event of the customer closes the account and all claims against the account are paid, the customer shall receive a refund for their deposit which the District shall issue within 60 days. In lieu of a cash deposit, the consumer can elect to provide the District with a demonstrated regular payment history from another utility which shows no delinquent or late payments for a period of twelve months.

Deposit:

¾" meter	$85.00
1" meter	$195.00
1 ½" meter	$300.00
2" meter	$800.00
3" meter	$850.00

1.01.380 Responsibility for Charges - Payment of bills – Delinquencies – Service Turn-off and Disconnection *(April 18, 2011 & August 20, 2012)*

A. Responsible Party. All district accounts for water service shall be in the name of the property owner. District accounts for water service shall not be in the name of a tenant, occupant, or property agent. The property owner shall be responsible for all water service rates, charges, and fees. A tenant may pay rates, charges, and fees on behalf of a property owner.

B. Application of Payments. Payments received by the district will be applied first to outstanding rates, charges, and fees.

C. Billing Periods and Due Dates. Water service charges will be billed monthly for water service provided during the previous month. Water service charges shall be due upon receipt and must be paid by the fifteenth (15th) day of the next month. If the 15th day is a weekend day or holiday, the water service charge will be due on the first business day following the 15th day. Thereafter, the water service charge will be past due and delinquent.

D. Past Due Notice – Service Turn-off. Water service charges not paid on time shall be assessed a delinquency notification penalty as specified in Section 1.01.390. Twenty-two (22) days or more after delinquency, the district general manager or designee shall send to the property owner a past due notice that will shall include at least the following:

1. the date on which the water service will be turned off, which shall not be less than eight (8) days after the date of the past due notice;

2. a statement that the water service will be turned off unless payment is made in full before the turn-off date; and

3. a notification that the "service disconnected/water reconnected for nonpayment" penalty of Section 1.01.390 will be assessed if the water service is turned off .

E. Water Service Turn-On. If the water service has been turned off due to nonpayment of water service charges and penalties, the water service will not be turned on until all

delinquent amounts have been paid in full. While a water service is turned off, the water service base charge of Section 1.01.390 shall continue to be imposed and shall be paid when due.

F. Lien Notices and Disconnection. If water service charges and penalties are delinquent for ninety (90) days or more, the district's general Manager or designee shall certify the delinquencies to the Pacific County auditor by filing a "notice of lien" or similarly titled document ("lien notice"). Upon the filing of the lien notice, the delinquencies and interest from the date of filing at the rate provided for in RCW 57.08.081(3) together with any such other charges or fees that may be legally imposed prior to foreclosure shall be a lien against the real property of the property owner.

If the water service charges and penalties are delinquent for sixty (60) days or more, the district may file a lawsuit in Pacific County Superior Court to collect all water service charges, penalties, and interest as authorized by RCW 57.08.081.

If water service charges, penalties, and interest are delinquent for one hundred eighty (180) days or more, and there is no building on the property that must have water service to be occupied, the property owner shall be deemed to have abandoned the water service connection. Following written notice of proposed disconnection, and an opportunity to be heard by the Board of Commissioners, the Board of Commissioners may order the permanent disconnection and removal of the water service, meter, and other water supply appurtenances from the district's water supply system. After disconnection, the monthly service charges as specified in Section 1.01.390 shall be discontinued. To re-connect the property to the district's water supply system, the property owner, or the property owner's successor, shall apply for a new water service connection as specified in Section 1.01.050 and shall pay all charges and fees for a new water service connection, including but not limited to installation charges, service charges, and water system connection charges as specified in Section 1.01.390.

1.01.390 Service Charges

Within the boundary of the District's service area the following rates shall apply:

DESCRIPTION	FEE	SECTION REFERENCE
Meter Tampering Fee	$100.00	Sec.1.01.330
Past Due Penalty	$10.00	Section 1.01.380
Service Disconnect/Reconnect Fee	$50.00	Section 1.01.380
After-Hours reconnection of service for nonpayment	$85.00	Section 1.01.380
Returned Check or ACH Rejection	$25.00	Section 1.01.380
Application for new service or transfer of service fee	$25.00	Section 1.01.050

Water for Tankers	$75.00 (plus five time the current metered rate for water)	Section 1.01.360

Monthly Service Charges:		
Base Rate 3/4 –Inch Meter	$39.73	Rate Study
Base Rate 1 – Inch Meter	$66.33	Rate Study
Base Rate 1 1/2 – Inch Meter	$132.34	Rate Study
Base Rate 2 – Inch Meter	$202.56	Rate Study
Base Rate 3 – Inch Meter	$230.78	Rate Study
Base Rate 4 – Inch Meter	$348.69	Rate Study
Base Rate 6 – Inch Meter	$677.23	Rate Study

Meter Water Rate:		
Metered Rate (per 100 CF)	$2.19	Rate Study

General Facilities Charge:		
3/4 –Inch Service	$1,243.00	Section 1.01.350
1 – Inch Service	$2,075.00	Section 1.01.350
1 1/2 – Inch Service	$4,140.00	Section 1.01.350
2 – Inch Service	$6,337.00	Section 1.01.350
3 – Inch Service	$7,209.00	Section 1.01.350
4 – Inch Service	$10,914.00	Section 1.01.350
6 – Inch Service	$21,181.00	Section 1.01.350

Local Facilities Charge:		
Water Main Installation Fee (6” or smaller)	$12.50 per lineal foot of frontage	Section 1.01.270
Water Main Installation Fee (8” and larger)	$15.00 per lineal foot of frontage	Section 1.01.270
As established by a Customer Generated Infrastructure Agreement		Section 1.01.270

Meter Installation Fee:		
3/4 –Inch Meter	$650.00	Section 1.01.190
1 – Inch Meter	$1,050.00	Section 1.01.190
1 1/2 – Inch Meter	$1,975.00	Section 1.01.190

2 – Inch Meter	$3,750.00	Section 1.01.190
Greater than 2 – Inch Meter	Priced at time of request	Section 1.01.190

Fire Flow Rate:		
Fire Flow Rate 2 – Inch	$29.54	Section 1.01.350
Fire Flow Rate 3 – Inch	$41.54	Section 1.01.350
Fire Flow Rate 4 – Inch	$53.55	Section 1.01.350
Fire Flow Rate 6 – Inch	$77.56	Section 1.01.350
Fire Flow Rate 8 – Inch	$101.57	Section 1.01.350

Permanent Disconnection Fee:		
3/4 – Inch Service	$480.00	Section 1.01.311
1 – Inch Service	$800.00	Section 1.01.311
1 1/2 – Inch Service	$1,500.00	Section 1.01.311
2 – Inch Service	$2,500.00	Section 1.01.311
3 – Inch Service	$2,800.00	Section 1.01.311
4 – Inch Service	$4,200.00	Section 1.01.311
6 – Inch Service	$8,200.00	Section 1.01.311

Credit Card Payments	The District will accept credit card payments through its vendor at a fee established by the vendor to be paid by the customer desiring such service.
Low Income Assistance	In accordance with RCW 57.46, the District shall participate in a program to offer voluntary contributions to assist low-income residential customers.

1.01.391 Billing dispute policy

Responsibilities

The General Manager shall be responsible for verifications, with the exception of meter readings, as needed. The Office Manager shall be responsible for initiating meter reading verifications, adjustments to accounts, and applicable record keeping.

Adjustment Protocol

Determination of Cause

When an adjustment to a high water bill is requested by the customer, the customer will first be asked if the high bill is due to a leak that has been repaired.

1. If the answer is no, the meter will be re-read. If the high water bill is due to a meter reading error, the customer will be notified of the amount due on the current bill

along with the amount of the adjustment on the next bill (if any). If the meter reading is correct, the customer will be notified that they are responsible for the full amount of the current bill.
2. If the answer is yes, then the customer will be mailed a Water Leak Repair Verification form or instructed to pick one up at the District office. The completed form will be returned to the Office Manager.

Challenges to Meter Accuracy

Should the customer desire to challenge the accuracy of the meter, the following protocol will be followed:

1. The customer shall submit a written request to have the meter tested. The meter will be tested by the District at no cost to the customer. The customer can view the testing.
2. Meters installed as replacements for stopped/under registering meters or meter replacements because of age will not be tested at District expense. Exceptions are at the discretion of the General Manager when subsequent consumption appears abnormal for the size of the service lien and the type of dwelling at the service address.
3. If the meter test indicates that the meter is overstating the water usage outside of industry accepted tolerances (ANSI/AWWA standard C700-95), the amount of overcharged consumption will be calculated from the test report results and credited to the customer's account.
4. If the test indicates that the meter is accurate within industry accepted tolerances (ANSI/AWWA standard C700-95) or understating water usage, the customer will be notified that they are responsible for the full amount of the bill.
5. If the customer disputes the accuracy of the District's meter test and desires a test of the meter accuracy by a third party, the following terms will be offered:
    a. If the independent test indicates that the meter is accurate within industry accepted tolerances (ANSI/AWWA standard C700-95) or understating water usage, the customer will have a meter testing fee of actual cost plus the meter cost added to their next bill. The customer is responsible for the full amount of the bill.
    b. If the independent meter test indicates that the meter is overstating the water usage outside of industry accepted tolerances (ANSI/AWWA standard C700-95), the amount of overcharge consumption will be calculated from the test report results and credited to the customer's account. The District will absorb the cost of the test.

1.01.400 Severability

The provisions of this resolution are declared separate and severable. If any provision of this resolution or its application to any person or circumstance is held invalid, the remainder of this resolution or application of the provision to other persons or circumstances shall be

unaffected.

Resolutions amending North Beach Water District's Rules and Regulations

Resolution 13-2008 adopted September 15, 2008

Resolution 07-2009 adopted February 17, 2009

Resolution 18-2009 adopted July 20, 2009

Resolution 01-2010 adopted January 19, 2010

Resolution 03-2010 adopted June 21, 2010

Resolution 04-2010 adopted June 21, 2010

Resolution 07-2011 adopted April 18, 2011

Resolution 08-2011 adopted June 20, 2011

Resolution 11-2011 adopted June 20, 2011

Resolution 13-2012 adopted August 20, 2012

Resolution 19-2013 adopted September 16, 2013 (Sections 1.01.270, 1.01.350, and 1.01.390)

BEFORE THE BOARD OF COUNTY COMMISSIONERS
PACIFIC COUNTY, WASHINGTON

RESOLUTION NO. 2007-064

WHEREAS, pursuant to Resolution No. 2004-074, the Board of County Commissioners formed the North Beach Public Development Authority for the purpose undertaking, assisting with and otherwise facilitating the improvement of municipal water and/or fire suppression service for the unincorporated communities on the Long Beach Peninsula north of Cranberry Road; and

WHEREAS, the Board of County Commissioners formed the Authority for a limited period of time, with the intent and understanding that may the voters may ultimately be asked to form a water district for the purpose of taking over the functions and duties of the Authority; and

WHEREAS, the Authority acquired the Pacific Water Company and the Ocean Park Water Company, which combined serves 2200 residences and 300 businesses; and

WHEREAS, pursuant to Chapter 57.04 RCW, a petition for formation of the North Beach Water District was presented to the Board of County Commissioners and filed with the Pacific County Auditor, requesting the formation of a water district in the area described in the petition, for the purpose of purchasing, acquiring, operating and maintaining public water supply facilities for all uses and purposes authorized by law; and

WHEREAS, the Pacific County Auditor, by letter dated August 7, 2007, certified that the petition was signed by at least 10 percent of the registered voters who voted in the last general election, and who are qualified electors residing within the proposed district on the date of filing of the petition, as required by RCW 57.04.030; and

WHEREAS, the Pacific County Auditor transmitted the petition and the certification to the Board of County Commissioners, who scheduled a hearing on the proposed water district formation for October 9, 2007 at 10:30 a.m. which was subsequently continued to October 23, 2007 at 10:30 a.m. and further continued to 1:15 p.m. on October 23, 2007, and

WHEREAS, the Board of County Commissioners caused notice of the presentment of the petition, the time and place of the hearing, and the boundaries of the proposed water district to be published on September 12 and 19, 2007 in the Chinook Observer; and

WHEREAS, the hearing was held as scheduled, and the Board of County Commissioners heard all persons desiring to be heard on all matters affecting the

formation and boundaries of the proposed water district, and considered all testimony and written evidence filed with the Board; and

WHEREAS, after consideration of all testimony and review of all pertinent information submitted at the hearing, the Board of County Commissioners under their authority pursuant to RCW 57.04.030, established amended boundary lines for the proposed water district; and

WHEREAS, the Board of County Commissioners desires to provide for an election on the proposed water district; now, therefore

BE IT HEREBY RESOLVED by the Board of Pacific County Commissioners as follows:

Section 1. The petition for formation of the North Beach Water District, and the proposed boundaries thereof, as set forth in Exhibit A to this Resolution, are hereby approved.

Section 2. Pursuant to RCW 57.02.040, the Board of County Commissioners finds that the proposed water district formation is in compliance with the Capital Facilities Element of the County comprehensive plan, and its supporting documents;

Pursuant to RCW 57.04.030, the Board further finds that creation of the proposed district will be conducive to the public health, welfare and convenience and be of special benefit to the land within the proposed water district.

Section 3. Pursuant to RCW 57.04.050, the Pacific County Auditor is requested to call a special election within the proposed water district on February 19, 2008, at which a ballot proposition authorizing the proposed water district to be created shall be submitted to the voters for their approval or rejection. The ballot title of this proposition shall be as follows:

PROPOSITION NO. 1

The Board of County Commissioners adopted Resolution No. 2007-064 concerning formation of the North Beach Water District. This resolution approves a petition proposing formation of a new public water district in order to provide water service to all properties within the district. The district is generally located between the Pacific Ocean and Willapa Bay and between 295th on the north and 179th on the south excluding Sections 3, 10, and 15 of Township 11 North, Range 11 W., W.M., all as more particularly described in Resolution No. 2007-064. Should this proposition be approved?

WATER DISTRICT . . . YES [ ]
WATER DISTRICT . . . NO [ ]

Pursuant to RCW 57.12.030, the Pacific County Auditor shall call a special election of the initial district commissioners at the same election. The Pacific County Auditor shall provide for a special filing period for district commissioner candidates in accordance with RCW 57.12.030. The Pacific County Auditor shall give notice of the elections pursuant to RCW 57.04.050 and applicable election laws.

PASSED by the BOARD in regular session at South Bend, Washington, by the following vote, then signed by its membership and attested to by its Clerk in authorization of such passage the 23rd day of October 2007.

__3__ YEA; 0____ NAY; 0____ ABSTAIN; and 0___ ABSENT.

APPROVE AS TO FORM

/s/

David Burke, Prosecuting Attorney

ATTEST:

/s/

Kathy Noren, Clerk of the Board

PACIFIC COUNTY
BOARD OF COMMISSIONERS

/s/

Jon C. Kaino, Chair

/s/

Norman "Bud" Cuffel, Commissioner

/s/

Clay Harwood, Commissioner

PACIFIC COUNTY COMMISSIONERS

PACIFIC COUNTY COURTHOUSE
National Historic Site

Commissioners Office/ Meeting Room
1216 W. Robert Bush Drive
P.O. Box 187
South Bend, WA 98586

Willapa Harbor Area – (360) 875-9337
Peninsula Area – (360) 642-9337
Naselle – (360) 484-7337
North Cove Area – (360) 267-8337
FAX – (360) 875-9335
TDD – (360) 875-9400

CERTIFICATION

I, Kathy Noren, Clerk of the Board of County Commissioners of Pacific County, a Washington political subdivision and municipal corporation, do hereby certify that the foregoing is a true and correct copy of Resolution No.2007-064 of the Board of County Commissioners, duly passed by the County Commissioners on the 23rd d day of October, 2007.

/s/

_____

Kathy Noren
Clerk of the Board

APPENDIX E

NORTH BEACH WATER DISTRICT CONSTRUCTION STANDARDS

NORTH BEACH WATER DISTRICT
(NBWD)

PACIFIC COUNTY, WASHINGTON

CONDITIONS and STANDARDS

FOR

CONSTRUCTION of DEVELOPER EXTENSIONS

(2014 EDITION)

ADOPTED BY RESOLUTION NO. _____

DATE: _____

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TABLE OF CONTENTS

BEGINS ON
PAGE NO.

SECTION ONE - GENERAL CONDITIONS OF CONSTRUCTION

SECTION TWO - ENGINEERING SPECIFICATIONS, MATERIALS OF CONSTRUCTION, AND METHODS OF CONSTRUCTION

Engineering Specifications

Materials of Construction

Methods of Construction

SECTION 1

GENERAL CONDITIONS OF CONSTRUCTION

SECTION ONE

GENERAL CONDITIONS OF CONSTRUCTION

1. DEFINITIONS:

(a) "Board of Commissioners." The "Commissioners" of North Beach Water District (NBWD) or their authorized representative.

(b) "Concerned Parties." Those persons, companies, or agencies designated by NBWD as required to attend the preconstruction conference.

(c) "Contract Documents." The contract documents shall consist of the following and in case of conflicting provisions, the first mentioned shall have precedence; unless otherwise approved by NBWD:

(1) Developers Agreement for Water Main Extensions
(2) Change Orders (if NBWD approved)
(3) Addenda
(4) Conditions and Standards of Extensions to the NBWD Water System
(5) Standard Specifications (WSDOT Standard Specifications)
(6) Plans (Approved by NBWD)
(7) Standard Details (WSDOT)

These documents shall form the Contract.

(d) "Contractor." The person or firms employed by the Developer to do any part of the Work, all of whom shall be considered agents of the Developer.

(e) "Design." The preparation of the Plans for the extension to NBWD's water distribution system.

(f) "Developer." The party having an agreement with NBWD to cause the installation of water works improvements, to become a part of NBWD's water system upon completion and acceptance and includes the Developer's agents.

(g) "Developer's Engineer." The engineering firm, and that firm's representatives, retained by Developer to design the Plans for the Work and which shall be considered agent of the Developer.

(h) "NBWD Engineer or Engineer". The engineer employed by NBWD or the engineering firm, and that firm's representatives retained by NBWD to act as the Engineer for the Work.

(i) "Extension(s)". The water system to be constructed according to this agreement and connected to NBWD's water distribution and/or sewer collection system and transferred to NBWD for operation and maintenance.

(j) "Maintenance Bond." A bond furnished by the Developer and written by a corporate body qualified to write surety in the State of Washington,

guaranteeing that the Developer will repair any defects found in the work within one year of the date of formal acceptance of the work by NBWD.

(k) "Otherwise Specified", or "As Specified". The directions contained in the Plans, Special Specifications, if any, and otherwise as given by NBWD incident to the performance of the Work other than in these General Specifications.

(l) "Operations Manager." NBWD's duly appointed Water & Field Superintendant - Planning Manager.

(m) "Performance Bond." A bond furnished by the Developer and written by a corporate body qualified to write surety in the State of Washington, guaranteeing that the work will be completed in accordance with the plans and specifications.

(n) "Plans or Construction Drawings." NBWD approved drawings, including reproductions thereof, of the work to be done as an extension to NBWD's water distribution system, prepared by an Engineer licensed in the State of Washington.

(o) "Standard Specification." All work shall conform to the latest edition of The Standard Specification for Road, Bridge and Municipal Construction prepared by the Washington State Department of Transportation and the Washington State Chapter of American Public Works Association, and current amendments thereto, except as may be specifically modified herein.

(p) "Specifications." The directions, provisions, and requirements approved by NBWD Board of Comissioners for the performance of the work and for the quantity and quality of materials.

(q) "Work." The labor or materials or both, superintendence, equipment, transportation, and other facilities necessary to complete the Contract.

2. PURPOSE:

NBWD is responsible for insuring that water mains are constructed in accordance with currently accepted standards for public work. The requirements imposed upon developers and contractors are intended by NBWD as a contract with the Developer, which incorporates minimum standards prerequisite to acceptance of the Work by NBWD as part of its water distribution system. Privately constructed extensions will not be permitted to connect to NBWD's system unless the Work is performed and paid for in accordance with this Agreement.

3. AUTHORITY OF NBWD:

NBWD shall have authority to approve, reject or require changes in Plans designed by Developer's Engineer; to require such changes in the Plans during the course of work; to inspect the work; to stop work to insure compliance with the approved Plans and Specifications; to reject non-conforming work and materials; and to decide questions which may arise in the execution of the Work. NBWD shall have the authority to impose fines for violation of NBWD policies adopted pursuant to resolution.

4. DEVELOPER TO BE INFORMED:

The Developer shall keep fully informed regarding the nature, quality and extent of the work to be done, and if in doubt, to secure specific instructions from NBWD.

The Developer shall keep a competent supervisor on the Work site during its progress who shall represent the Developer, and to whom instructions may be given as though to the Developer. The Supervisor shall be familiar with the Plans and Specifications and shall promptly report to NBWD any error, inconsistency or omission which may be discovered.

The Developer shall enforce discipline and good order among its employees and shall not employ on the Work site any unfit person or anyone not skilled in the work assigned. Employees or agents of the Developer who may impair the quality of the construction shall be removed from the Work site upon the written request of NBWD.

5. PLANS AND SPECIFICATIONS ACCESSIBLE:

One copy of the Plans and Specifications shall be constantly accessible on the job.

6. FINAL INSPECTION:

All material and completed work are subject to final inspection and testing by NBWD to determine whether the Work complies with the Plans and Specifications.

7. "AS-BUILT" DRAWINGS:

The Developer will maintain "as-built" information about the project as it is constructed. The drawings shall be made available to NBWD upon completion of the project in the form of "as-built" records.

8. OWNERSHIP OF PLANS:

The originals of all "as built" Plans prepared by Developer's Engineer shall be delivered to NBWD as a condition of and prior to acceptance of the project, and shall become the property of NBWD. Neither Developer nor Developer's Engineer shall have any rights of ownership, copyright, trademark or patent in the Plans.

9. QUALITY OF MATERIALS AND WORKMANSHIP:

All materials shall be new, and workmanship and materials shall be of the highest quality commonly used. The Developer shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

10. MATERIAL AND EQUIPMENT LIST:

The Developer shall file a material and equipment list with NBWD prior to the preconstruction conference, including the quantity, manufacturer and model number, acceptability under any specified inspections and/or tests required by

AWWA specification, if applicable, of material and equipment to be installed as part of the Work. NBWD may reject materials and equipment which do not conform to NBWD specifications and the approved Plans. Failure of NBWD to reject materials and equipment when the list is filed shall waive NBWD's right to reject such materials or equipment thereafter.

11. DETERMINATION OF "AS EQUAL":

NBWD and its Engineer shall be the sole judge whether supplies or material qualify "as equal" substitutions under the Plans and Specifications.

12. OMISSIONS AND DISCREPANCIES:

Minor items of work or materials omitted from Plans and Specifications prepared by NBWD's Engineer, or Developer's Engineer, but clearly inferable therefrom and called for by good practice, shall be provided and/or performed by the Developer. In case of doubt, NBWD's decision shall be determinative.

13. INSPECTION AND TESTS:

All work shall be subject to inspection by NBWD. NBWD shall have access to the Work site at all times, and the Developer shall provide proper facilities for such access and inspection. The Developer shall make reasonable tests of the Work site at the Developer's expense upon NBWD's request. Whenever work must be specially tested or inspected for compliance with public regulations, or with the Plans and Specifications, the Developer shall give NBWD reasonable notice of the readiness of the Work for such test or inspection. NBWD will make inspections within 24 hours of notification by the Developer. Work site shall not be covered up without consent of NBWD, or it must be uncovered for inspection at the Developer's expense. Such inspections and tests shall not relieve the Developer of any of its responsibilities under this Agreement.

The presence or absence of a NBWD inspector on any job is discretionary with NBWD, and neither presence nor absence of a NBWD inspector will relieve the Developer of responsibility to obtain the construction results specified in this agreement.

NBWD is not a safety expert, and is not engaged in that capacity whenever performing inspections and tests. The authority of NBWD to perform inspection and tests shall not relieve the Developer of its responsibility for safety, as specified in 33.

14. COMPLIANCE WITH PUBLIC AUTHORITY:

The Work shall conform to the regulations of each public authority with jurisdiction over the manner and quality of performance of the Work. Construction in public roads or rights-of-way shall conform to the standards and requirements of the governmental agency having jurisdiction, and to the requirements of the franchise or permit therefor. The Developer shall be responsible for ascertaining the requirements of each public authority and the franchises and permits.

The Developer shall be responsible for coordinating construction activity with all interested parties and agencies.

15. CROSS-CONNECTION CONTROL:

Developer shall comply with all government and NBWD rules and regulations governing cross-connections. Developer shall install and maintain backflow prevention devices required by NBWD as a condition of final acceptance of the extension(s) by NBWD.

16. PRE-CONSTRUCTION CONFERENCE:

The Developer shall hold a pre-construction conference with all concerned parties at NBWD office at least five days before work on the extension(s) commences. The Developer shall arrange for the conference and for the attendance of concerned parties.

17. PRE-CONSTRUCTION PHOTOS:

Pre-construction photos acceptable to NBWD shall be submitted to NBWD at the pre-construction meeting.

18. PERMITS:

The Developer shall not hold a pre-construction conference until all necessary permits have been issued by public authority and are in NBWD possession. The Developer shall pay the cost of obtaining all required permits, and shall reimburse NBWD for all costs incurred by NBWD for permits, inspection fees and other charges imposed by public authority because of the Work. The Developer shall be responsible for assuring compliance with the requirements of all permits, franchises, and licenses.

19. SURVEY CONTROL:

The Developer shall provide all property corners and street centerline stakes, and shall provide reasonable and necessary opportunities and facilities for setting points and making measurements. The Work shall not commence until the Developer has made provision to establish such points necessary for the Work. The Work shall conform to such points and instructions. The Developer shall preserve bench marks, reference points and stakes, and, in case of destruction, shall be charged for any resulting expense and shall be responsible for any errors that may be caused by their absence or disturbance.

20. RESTORATION OF IMPROVEMENTS:

All existing improvements removed or disturbed during the Work shall be restored to their original condition. A signed release from the affected property owner will be required. All restoration shall be made at Developer's expense to the condition of the area prior to construction.

Whenever restoration of existing improvements will be necessary, the Developer shall provide photographs before and after construction acceptable to NBWD.

21. ACCESS:

Bridging (steel plating) shall be provided across private driveways and roadways whenever trenches are open to avoid interference with normal traffic flow.

22. SPECIFICATIONS INCORPORATED BY REFERENCE:

Where any standard specifications are referenced or included by reference herein, the latest issue and/or amendment thereto published as of the date of this agreement shall be incorporated into the contract. Should a conflict exist between the approved design drawings and any standard specifications or details referenced herein, NBWD will determine which will prevail.

23. USE OF COMPLETED PORTIONS:

NBWD may take possession of and use any completed or partially completed portions of the Work. Possession and use shall not constitute acceptance of any of the Work.

24. EXISTING UTILITIES OR OBSTRUCTIONS:

(a) Preparation of Plans by NBWD Engineer: Existing utilities and obstructions are shown on the Drawings so far as known to NBWD Engineer and NBWD. The information is not guaranteed and is provided only for such value as it may have. Incomplete or erroneous information shall not be the cause of claim against NBWD Engineer or NBWD and shall not relieve the Developer of responsibility for repairing any damage caused to such utilities during performance of the Work.

(b) Preparation of Plans by Developer Engineer: NBWD will provide to the Developer any information it may have regarding existing utilities and obstructions. The information is not guaranteed but is provided only for such value as it may have. Incomplete or erroneous information shall not be the cause of claim against NBWD Engineer or NBWD and shall not relieve the Developer of responsibility for repairing any damage caused to such utilities during performance of the Work.

(c) Notification of Utilities: The Developer shall contact all utilities and determine whether existing utilities and obstructions exist. The Developer shall reimburse NBWD for damage to the property of NBWD or damage to property of others for which NBWD is liable caused by the Developer and for other expenses, including reasonable attorneys' fees and court costs incurred by NBWD because of such damage. Whenever the Developer fails to repair or restore existing improvements damaged by its contractor within 72 hours of notice, NBWD may order the work done by others and all costs incurred shall be paid by the Developer; provided that if NBWD determines an emergency exists, it may notify the Developer who shall immediately commence repair or restoration work, or it may make repairs or restoration at the Developer's expense.

25. CLEANUP:

The construction site shall be kept clear during the Work. Before the Work shall be considered complete, the Developer shall clean out ditches filled during the

Work; replace damaged surfacing; remove surplus materials, trash and brush; repair all damages; and otherwise leave the job in a neat and orderly condition. Dust control shall be provided during the Work and during cleanup. The Developer shall keep existing roads and streets adjacent to or within the limits of the project open to and maintained in a good and safe condition for traffic at all times. The Developer shall remove, on a daily basis, any deposits or debris which accumulates on the roadway surface as a result of construction operations. Removal shall be performed on a more frequent basis should NBWD determine that such removal is necessary.

26. PUBLIC HAZARD OR INCONVENIENCE:

If performance of the Work results in hazard or inconvenience to the public, then NBWD may correct the same, and the Developer shall reimburse NBWD for expense incurred. The Developer shall also reimburse NBWD for the expense incurred in complying with any order of public authority lawfully made with respect to the Work during the performance of the Work or within two years after acceptance of the same.

27. PROTECTION OF WORK AND PROPERTY:

The Developer shall exercise due care to protect property and the Work and shall supervise the project to ensure the contractor exercises such care. The Developer shall be solely responsible for any loss or damage to property or the Work occurring prior to the completion of and acceptance of the Work by NBWD.

28. ROYALTIES AND PATENTS:

Developers shall pay all royalties and license fees and defend all suits or claims for infringement of any patent rights and shall save NBWD harmless on account thereof, unless a particular process or the product of a particular manufacturer is specified by NBWD and the Developer or its Contractor are unaware that the process or article is an infringement of a patent.

29. OTHER WORK:

NBWD may let contracts affecting the Work. The Developer shall afford reasonable opportunity to other contractors for introduction and storage of their materials and performance of their work. The Work and other contracts shall be properly coordinated.

30. CONTRACTORS:

Only contractors licensed and bonded with the State of Washington shall install extensions; a copy of the license shall be provided to NBWD. Developer shall submit in writing not less than fifteen (15) days before the pre-construction conference, the name(s), address(esp) and telephone number(s) of all contractors and subcontractors the Developer proposes to use in doing the Work. If NBWD disapproves, then it shall notify Developer within ten (10) days. Nothing contained in this agreement shall create any contractual rights between NBWD and any person or firm employed to do the Work.

31. TRAFFIC MAINTENANCE AND PROTECTION:

All work shall be performed with due regard for the safety and convenience of the public and in a manner that minimizes interference with automotive and pedestrian traffic. Flagging personnel, barricades, signs and traffic control shall be furnished as required by appropriate agency. Emergency vehicles shall be provided access at all times.

Prior to commencement of construction, the Developer shall be required to furnish a traffic plan, to show how access will be maintained. The Plan shall also show how restrictions to through traffic shall be kept to a minimum in keeping with good construction practice.

This Plan shall include a one sheet overall project map of scale not less than 1" = 400'. The map shall contain a total program indicating traffic flow patterns for the construction site. The map shall be supplemented by a signing plan in accordance with the State of Washington "Manual of Uniform Traffic Control Devices for Streets and Highways". This plan shall be subject to the review and approval of NBWD and Pacific County.

All lane closures shall be approved by NBWD and Pacific County prior to construction. Any approved lane closures will not be permitted prior to 8:30 a.m. (local time) and not after 3:30 p.m. (local time) without prior written NBWD approval.

The Developer shall be required to provide five (5) working days notice on any traffic revisions. NBWD will not furnish flagmen or any devices for the control of traffic. All flagmen employed by the Developer shall be state certified.

If at any time the Developer's activities result in closure, substandard condition, restrictions to traffic use of all or portions of the roadway which are specified to remain open to traffic, the Developer shall immediately, at his own expense, furnish all material, labor, equipment, necessary to restore the streets to the satisfaction of NBWD and the County. Work necessary to restore the streets to traffic shall continue on a round-the-clock basis until they are reopened to traffic in conformance with the specifications. Upon failure of the Developer to immediately provide the necessary material, labor, equipment, to restore the streets to traffic when ordered to do so by NBWD, NBWD will be at liberty without further notice to the Developer or his Surety, to provide the necessary material, labor, equipment to restore the streets to traffic and all costs thereof shall be at the Developer's own expense.

32. SANITATION:

Necessary sanitation convenience properly secluded if possible from public observation shall be provided and maintained during the Work as required by appropriate agency.

33. SAFETY:

The Developer and Developer's Contractor will be solely and completely responsible for conditions of the job site, including safety of all persons and property during the performance of the Work, and for compliance with all federal,

state and local safety laws and regulations. This requirement will apply continuously and will not be limited to normal working hours.

The right of NBWD or NBWD Engineer to conduct construction review of the Contractor's performance or inspection of the Work or the site is not intended to include review of the adequacy of the Contractor's safety measures in, on or near the construction site.

34. CONFINEMENT OF CONTRACTOR'S OPERATIONS:

The Developer shall ensure that the Contractor confines construction activities within the property of the Developer and the limits of easements and construction permits outside of the Developer's property. Damage to property or persons from any encroachment beyond these limits shall be the responsibility of the Developer.

35. ALIGNMENT:

The Developer shall furnish sufficient horizontal control, including lot stakes, for locating and staking the lines and appurtenances. Accuracy of such horizontal control is the sole responsibility of the Developer and any modification of horizontal location of any facility shall be at the Developer's expense.

The water main shall be installed on the ground or roadway rough grade with forty-two (42) inches minimum cover for transmission mains and thirty-six (36) inches minimum cover for distribution mains. The notice by the Developer to NBWD that the ground or roadway is ready for water main installation shall be considered a representation that the Developer has brought the ground or roadway to grade or subgrade, and that he intends no further grading work. Any modification of the main or appurtenances required to adjust to grade changes shall be at the Developer's expense. If the Developer contemplates off-roadway grading after installation of the water main that will affect the setting of fire hydrants or other appurtenances, he shall so state in writing prior to the installation of the main. Any adjustments required by such grading shall be at the Developer's expense.

NBWD will authorize the Developer to proceed with installation of the water main only after all necessary grading and fills are completed, and other utilities or pipes which, in the opinion of NBWD, should be installed prior to the water main have been completed. NBWD reserves the right to stop installation of portions of the water system which, in the opinion of NBWD, will be damaged or jeopardized by other utility or pipe installation until such other installations are complete.

36. TAPS, CUT-INS, AND LARGE METER TESTS:

All taps and cut-ins to the existing water mains, excluding manholes, shall be made by NBWD at fees established by the Board of Commissioners. If extensions require meters three inches or larger, then meter installation, including valves, piping, vaults, drain lines and meters shall be performed by the Developer's Contractor according to NBWD standards. The Developer shall pay the meter test fee established by NBWD and shall sign a NBWD meter application form and pay all fees and charges due at that time.

37. RECORDING:

NBWD will not approve the Plat for recording until all of the underground portion of the extension(s) have been installed and tested. A copy of the proposed final plat must be delivered to NBWD before recording for review of adequacy of easements. A copy of the final recorded plat and all necessary recorded easements shall be delivered to NBWD before service connections will be allowed to the extension.

38. COST OF WATER:

NBWD will furnish a reasonable amount of water without cost for the initial testing, flushing and purifying of the system. Developer shall pay the cost of all other water furnished by NBWD for testing, flushing or purifying the system based upon NBWD's estimates of the quantity of water use, which estimates shall be conclusive.

Construction water shall be furnished at NBWD's regular rates through a temporary certified meter provided by the Developer at rates established by NBWD resolution.

39. DEFECTIVE MATERIALS AND WORKMANSHIP:

Materials, work or workmanship which, in the opinion of the Engineer, do not conform to these Specifications and Plans or fail to meet the tests herein described or are not equal to the sample submitted to and approved by the Engineer, or are in any way unsatisfactory or unsuited to the purpose for which they are intended will be rejected. The Developer shall remove from the work and its vicinity, without delay, all rejected materials.

Unsatisfactory materials and workmanship may be rejected at any time, notwithstanding any previous testing, inspection or acceptance of such materials, equipment or workmanship.

40. DELAY IN COMPLETION:

The Developer is expected to carry on the work and to complete it without unnecessary delay once the work has begun. If the work is not completed within a reasonable time from the date the work is begun, NBWD may revoke its acceptance of the Developer's Agreement, or it may impose reasonable conditions as a prerequisite to continuation of the work, including a charge paid by the Developer for such cost or damage as NBWD has suffered because of the delay. In the event NBWD finds it necessary to complete the work to be performed by the Developer, or is otherwise damaged by the Developer's failure to complete the work, the Developer shall be liable to NBWD for its costs, expenses, and damages arising out of his failure to complete the work.

Should the Developer abandon the work, fail or refuse to complete the work embraced in the contract or fail to pay just claims for labor and materials, NBWD reserves the right to charge against the Developer all extra legal, engineering or other costs caused by such abandonment, failure or refusal. The legal costs will also include all attorney's fees and other costs to NBWD in defending or prosecuting any suits in connection with such abandonment, failure or refusal and

non-payment of claims, wherein NBWD is made a co-defender, and the Developer agrees to pay all such costs.

If the Developer abandons the work for any cause or refuses to comply with the provisions of the Plans and Specifications, NBWD has the right to notify the Developer's surety and require said surety to complete the work in accordance with the Plans and Specifications.

41. BILL OF SALE:

Upon completion of the work and approval of NBWD, the Developer shall, as a condition of acceptance by NBWD, convey the work lien-free to NBWD by bill of sale, in accordance with the form attached as an appendix to these regulations.

42. INDEMNITY:

The Developer shall indemnify, defend and hold NBWD and all of its representatives harmless from and against all losses and claims, demands, payments, suits, actions, recoveries and judgments of every nature and description brought or recovered against NBWD by reason of the act or omission of the Developer, its agents or employees, in the performance of the Work, and for any cost or expense incurred by NBWD in connection therewith, including overhead expense, legal expense, reasonable attorney's fees and costs attributable thereto; and if suit in respect to the foregoing is filed, then Developer shall appear and defend the same at its own cost and expense, and if judgment is rendered or settlement made requiring payment of damages by NBWD, then the Developer shall pay the same.

Developer shall indemnify, defend and hold NBWD harmless from any liability or expense, including reasonable attorney's fees incurred by NBWD by reason of Developer's (or Developer's employees or contractors) breach of any covenant contained in any franchise or permit granted by state, city, or public or private utility to NBWD for the purpose of enabling Developer to undertake construction within any right-of-way.

Developer further agrees that if any official complains to NBWD that Developer is violating such franchise or permit in any respect, or if Developer damages any NBWD's facilities, then the Developer upon reasonable notice shall comply with such franchise or permit or to make repairs or restoration. If NBWD deems it necessary to make any repairs or restoration (emergency or otherwise), then the Developer shall reimburse NBWD for the cost thereof.

In any claim against NBWD, its agents or employees by any employees of the Developer, its contractor, or any subcontractor, or anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation contained herein shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Developer, Contractor, or any subcontractor under Workmen's Compensation Acts, Disability Benefit Acts, or other employee benefit acts. THIS WAIVER HAS BEEN MUTUALLY NEGOTIATED BY THE PARTIES.

43. DEVELOPER'S PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE:

The Developer shall not commence work until it has furnished evidence (in duplicate copy) of insurance required hereunder, and such insurance has been approved by NBWD Attorney; nor shall the Developer allow any contractor or subcontractor to commence work on his contract or subcontract until the same insurance requirements have been complied with by such contractor or subcontractor.

The Developer shall purchase from insurance companies which have an A.M. Best rating of "A VII" or better commercial general liability and automobile liability insurance against liability to the developer, NBWD, NBWD's Engineer and NBWD employees for negligent injury to person or property resulting from performance, supervision, or inspection of the work. NBWD and NBWD's Engineer shall be named as an additional insured under such policy. Proof of the existence of such insurance shall be provided to NBWD in a form acceptable to NBWD. The minimum limits of coverage shall be as follows:

General Aggregate	$2,000,000.00
Products-Comp/OPS Aggregate	1,000,000.00
Personal Injury	1,000,000.00
Each Occurrence	1,000,000.00
Automobile Liability	1,000,000.00

Policies shall be kept in force until the project is accepted by NBWD. The Developer shall provide NBWD at least 45 days written notice by "certified mail" of cancellation, non-renewal, material reduction or modification of coverage.

The coverage provided by the Developer's insurance policies are to be primary to any insurance maintained by NBWD, except with respect to losses attributable to the sole negligence of NBWD. Any insurance that might cover this Agreement which is maintained by NBWD shall be in excess of the Developer's insurance and shall not contribute with it.

The Developer's insurance policy shall protect each insured in the same manner as though a separate policy had been issued to each. The inclusion of more than one insured shall not affect the rights of any insured with respect to any claim, suit or judgment made or brought by or for any other insured or by or for any employee of any other insured.

The general aggregate provisions of the Developer's insurance policy shall be amended to show that the general aggregate limit of the policies apply separately to this project.

The Developer's insurance policy shall not contain a deductible or self-insured retention in excess of $10,000 unless approved by NBWD."

Providing coverage in the stated amounts shall not be construed to relieve the Developer from liability in excess of such limits.

44. COMPENSATION AND EMPLOYER'S LIABILITY INSURANCE:

The Developer shall maintain Workmen's Compensation Insurance or Maritime Workmen's Insurance, as required by state or federal statute for all of his employees to be engaged in work on the Project and, in case any such work is sublet, the Developer shall require the contractor or subcontractor similarly to provide Workmen's Compensation Insurance or Maritime Workmen's Insurance for all of the latter's employees to be engaged in such work. The Developer's Labor & Industries account number shall be noted in the Proposal in the space provided.

In the event any class of employees engaged in work at the site of the Project is not covered under the Workmen's Compensation Insurance or Maritime Workmen's Insurance, as required by state and federal statute, the Developer shall maintain and shall cause each contractor or subcontractor to maintain Employer's Liability Insurance with a private insurance company for limits of at least One Hundred Thousand Dollars ($100,000.00), each person, and One Million Dollars (1,000,000.00), each accident, and furnish satisfactory evidence of same.

45. COSTS OF LITIGATION:

If either NBWD or the Developer commences any legal action relating to the provisions of this agreement, then the prevailing party shall be entitled, to recover all costs of litigation, including but not limited to costs, witness, expert and reasonable attorney's fees, including all such costs and fees incurred on appeal.

In any litigation arising out of this Agreement or related to this Project to which NBWD is not a party the Developer will reimburse NBWD for all of its costs and expenses, including attorney's or engineer's fees, incurred as a result of such litigation.

46. STIPULATION OF VENUE:

It is agreed by the Developer that venue for any lawsuit arising out of this contract shall be the county wherein the primary construction site for the Project is located. Developers shall include a stipulation of venue in said county clause in all subcontracts hereunder.

47. PERFORMANCE AND MAINTENANCE BOND:

The Developer shall, prior to the commencement of the work, furnish a surety bond by a licensed insurance company in the amount of not less than 100% of the cost of the work as estimated and/or approved by NBWD's Engineer, insuring NBWD that the work will be performed in accordance with NBWD approved plans, and that any defective work or material discovered by NBWD within one year after the work has been formally accepted by NBWD will be corrected or replaced by the Developer in accordance with the provisions of these regulations.

The Developer shall, prior to acceptance of the work by NBWD, furnish a Maintenance Bond or "Assignment of Funds" in an amount equal to $2,000.00 or in the amount of not less than 10% of the amount of the Performance Bond whichever is greater, insuring NBWD that any defective work or material discovered by NBWD within two years after the work has been accepted by NBWD will be corrected or replaced by the Developer in accordance with the

provisions of these regulations. The Surety Bond shall assure correction of any defect covered by the Developer's warranty within thirty days.

48. DUST AND/OR MUD CONTROL:

The Developer shall furnish all labor, equipment and means required and shall carry out protective measures, wherever and so often as necessary to prevent his operations from producing dust and/or mud in amounts damaging to property or causing nuisance. The Developer shall be responsible for any damage resulting from dust and/or mud originating from his operations. The dust and/or mud abatement measures shall be continued until all required resurfacing is complete, or until the Developer has completed arrangements with NBWD, whereby he is relieved of further responsibility.

49. DAMAGE TO EXISTING IMPROVEMENTS:

All damage done to existing improvements during the progress of the work on the structures covered by these Specifications shall be repaired or restored by the Developer to the satisfaction of NBWD, using for such repair materials and methods conforming to the requirements of the "Conditions and Standards" of NBWD Plans and Specifications, any additional instruction issued therefore by the Engineer, with the intent that such damaged improvements be restored to equal or superior condition existing prior to damage. If the Developer fails to furnish the necessary labor and materials for such repairs, when ordered, NBWD may cause said labor and materials for such repairs to be furnished by other parties, and the cost thereof shall be paid by the Developer.

50. EASEMENTS:

(a) General: The Developer shall deliver to NBWD recorded utility easements and rights of access for all properties over which his extension to the water system is to be constructed and such other easements as the Commissioners may require. Title reports for all easement encumbered properties shall proceed by the Developer and submitted to NBWD. The Developer shall hold NBWD harmless from all expenses of removing any encumbrances or restrictions on NBWD's right to use and have right-of-way to the property through which the water main and appurtenances are constructed.

Unless otherwise approved by NBWD, all easements shall be a minimum of fifteen (15) feet wide and shall grant NBWD the right of access over the Grantor's property to repair and maintain the water mains. All easements shall prohibit the construction of any structures, or other substantial objects over the easement. The easements shall be exclusive in nature to the extent that other utilities may be permitted to cross them but not run parallel to the water lines within the easement, without the express written permission of NBWD.

Easements may be submitted on forms provided by NBWD. However, no easement will be accepted by NBWD until the Developer has first submitted a fully executed copy of the proposed easement to NBWD Attorney for his review and approval.

(b) Plats: In the case of extensions which are part of a development done concurrently with the platting of the property involved, the easement granted NBWD shall be boldly shown on the face of the plat. The plat shall contain the following restriction and grant of right-of-way, boldly displayed:

BUILDING RESTRICTIONS AND RIGHTS-OF-WAY

No permanent structure shall be erected, and no large trees or large shrubs, fences, gates, or ornamental landscaping items shall be installed in the area of ground for which easements in favor of NBWD or its successors have been designated in this plat. NBWD and its successors shall have the right to enter upon property within this plat to install, lay, construct, renew, operate, and maintain water and utility lines and mains.

(c) Survey: After construction of the extension, the Developer shall provide NBWD with a survey map showing the legal description of the property involved, the location of easements granted by the Developer to NBWD and the location of all water mains and appurtenances thereto which are part of the extension. The survey map shall be prepared and signed by a surveyor or civil engineer registered in the State of Washington.

(d) Procedure: Before final approval of any application of extension of NBWD's system is effective, and before any service is given, NBWD's regulations with respect to easements must be fulfilled. One should begin as soon as possible to comply with these regulations by taking the following steps:

1. Complete and execute the easement document, including a legal description, and submit it to NBWD. Approved forms are available through NBWD offices at the address listed below, and as contained in the attached appendix. Both husband and wife must sign the easement and have their signatures notarized. If the easement is signed by a single person, this needs to be stated on the form.

2. Direct the Developer's surveyor to prepare a survey map showing the easements and the location of the water main, and to send copies along with the electronic version of the map to NBWD.

51. DESIGN STANDARDS:

(a) General Requirements:

1. Water mains shall be laid only in dedicated streets or in easements which have been granted to NBWD. A street is normally not considered dedicated until the plat which created it has been filed with the County Auditor. Water mains shall be extended to the far end of the property being developed.

2. All water distribution main construction shall have minimum 3'-0" cover from finished grade. Water transmission mains shall have a minimum cover of 3'-6" cover from finished grade. The maximum shall be 5'-0" cover unless approved by NBWD.

3. Whenever possible, loop water mains to minimize occurrence of dead end lines. Provide fire hydrant or blowoff assembly at dead end mains for flushing purposes.

4. Mains shall generally be located parallel to and ten feet northerly or easterly of street centerline unless approved by NBWD.

5. Valves shall be installed at intervals not to exceed 1,400 feet. Valves shall be installed at each end of easements. Valves shall be installed on the water main at each end of mains located in easements.

6. Fire hydrants shall not exceed every 900 feet. This is the minimum requirement. The Fire District providing protection may require closer spacing.

7. Fire hydrants on dead end streets and roads shall be located within approximately 350 feet from the frontage center of the farthest lot. Distances required herein shall be measured linearly along street or road.

8. Pipes connecting hydrants to mains shall be at least 6 inch in diameter and not longer than 50 feet.

9. Dead end lines are not permitted except where the Developer can demonstrate to NBWD's satisfaction that it would be improbable to extend the line at a future date. Water mains on platted cul-de-sacs shall extend to the plat line beyond the cul-de-sac to neighboring property for a convenient future connection, and a two (2) inch blow off assembly or fire hydrant shall be provided.

10. All materials shall be new and undamaged.

11. Water main shall be ductile iron, pipe class 52, or PVC C-900 class 150.

12. All pipe and fittings shall be cement-lined ductile iron.

13. Provide bends in field to suit construction and in accordance with pipe manufacturer's recommendations so as not to exceed allowable deflection at pipe joints.

14. Provide thrust blocking or restrained joints at all fittings and bends in accordance with NBWD Standards and conditions.

15. Provide anchor blocking or equivalent at all up-thrust vertical bends in accordance with NBWD Standards.

16. All valve markers shall be installed and marked with the distance to valve being referenced.

17. Water services shall be ¾" dia. standard and 1" dia. for elevated properties, service lines shall be high molecular (200 psi, SDR 7) "poly" pipe (no joints beneath pavement areas).

18. All residential lots to be served with a single. 3/4 inch (minimum) meter unless otherwise specified. All service lines shall be the minimum size otherwise specified by the County Plumbing Code in accordance with fixture units, unless otherwise specified. Provide restrained joint pipe and fittings when installed in site sensitive areas identified by the Developer or NBWD.

19. Meter services and meter boxes shall be set to final grade and all adjustments shall be made prior to final pressure testing of the system, centerline of service inlets shall be located to match bottom elevation of meter box in such a manner that meter inlet and outlet will be the same elevation as bottom of meter box. Contractor shall furnish angle dual check valve with neoprene gaskets for outlet connections to meter at NBWD offices for each service installed. Service inlet shall be centered at inlet end of box and faced toward outlet end of box parallel with long sides.

20. All water services shall end within road right-of-way or easements.

21. All services, meter setters, and meter boxes shall be installed by the Developer. NBWD will install the meters.

22. Contractor shall furnish water sample stations to the NBWD office. One station is required for development in size of 1 to 10 lots. One additional station is required for each additional 50 lots or portions thereof.

23. All new buildings and residences shall include in their water service a suitable pressure reducing valve to protect the plumbing from excessive pressures, unless waived on the application form of NBWD.

24. All new construction shall comply with the "Accepted procedure and Practice in Cross Connection Control Manual" as published by the Pacific Northwest Section of the American Water Works Committee", 1995, Fifth Edition, and current amendments thereto. A copy of such is available for review at NBWD office.

25. <u>Cut in connections shall not be made on Fridays, holidays or weekends.</u>

26. All tapping sleeves and tapping valves shall be pressure tested prior to making connection to existing mains.

27. Contractor shall notify NBWD and obtain approval prior to any water shut-off or turn-on, affecting the water system, a minimum of 48 hours in advance.

28. Road restoration shall be per Pacific County and/or State design and construction standards. Developer and Contractor shall

become familiar with all County, and State conditions of required permits, and shall adhere to all conditions and requirements.

(b) System Demand:

1. Minimum Fire Flow Requirements

Type of Development	Minimum Fire Flow Required (gpm)*	Minimum Duration (Minutes)
Single Family	500	30
Multi-Family	750	60
Commercial	750	60
Industrial	1,000	60

* Flows shown above are minimum flows only for main extensions required for land development. Actual fire flow requirements for building permit approval/acquisition shall be determined in accordance with Pacific County Code.

2. Minimum system pressures to be 30 psi under maximum hour demands conditions and 20 psi under maximum hour demands, plus fire flow demands.

3. Maximum design velocities in mainline to be eight (8') feet/ second under maximum hour demand, plus fire flow demand, but in no case shall watermains less than 8-inch be permitted unless approved by NBWD.

SECTION 2

ENGINEERING SPECIFICATIONS,
MATERIALS OF CONSTRUCTION,
AND
METHODS OF CONSTRUCTION

SECTION TWO

ENGINEERING SPECIFICATIONS, MATERIALS OF CONSTRUCTION and METHODS OF CONSTRUCTION

1- ENGINEERING SPECIFICATIONS

1. GENERAL:

    a. All work shall be constructed in conformance with the most current Standard Specifications for Road, Bridge & Municipal Construction and current amendments thereto, State of Washington revised as to form by the APWA Supplement to make reference to Local Governments, herein referenced to as "Standard Specifications" and the Conditions and Standards as adopted by NBWD, shall be included as a part of the Specifications.

    b. Where the Standard Specifications and Conditions and Standards conflict with one another, the Conditions and Standards shall take precedence.

2- MATERIALS OF CONSTRUCTION

1. GENERAL:

    a. The type and class of materials to be used shall be as shown on the project plans reviewed and approved by NBWD. Where no specific reference is shown, the following specifications shall govern the materials used. All materials shall be new and undamaged, of a known brand, with replacement parts readily available from the general regional area.

    b. Prior to the installation of any facilities required for the project, all materials shall be approved by NBWD.

    c. All reference specifications herein shall be of the latest revision.

2. WATERMAIN:

    a. PVC pipe shall be AWWA C900 Pressure Class 150 PSI, D-1784, DR 18 Cast Iron Pipe Size w/Bell & Gasket. (All PVC pipe shall be push-on with ductile iron fittings.)

    b. All ductile iron pipes shall be push-on or mechanical joint. All joints shall conform to ANSI Standard A21.11 (AWWA C-111).

    c. The ductile iron pipe shall conform to ANSI Specification A21.51 or AWWA Specification C151, and current amendments thereto. Grade of iron shall be a minimum of 60-42.10. The pipe shall be cement-lined in

accordance with ANSI/AWWA C104/A21.4 and the exterior shall be coated with an asphaltic coating. Each length shall be plainly marked with the manufacturer's identification, year cast, thickness, class of pipe and weight.

d. Bolts furnished for mechanical joint pipe shall be high strength cast iron, with a minimum tensile strength of 50,000 psi. The class of ductile iron pipe shall be Class 53 for 4-inch pipe and Class 52 for 6-inch and larger diameter pipe. Six (6) inch hydrant spools shall be Class 53 or an approved equivalent.

e. The pipe shall have a nominal inside diameter of the size indicated on the NBWD approved Plans or as otherwise stated herein. All pipe shall be of one manufacturer and be carefully installed in complete compliance with the manufacturer's recommendations and these Specifications.

f. Flanged joints shall conform to ANSI/AWWA C110/A21.10.

3. SERVICE LINE MATERIALS:

a. HDPE "Poly" Pipe:

All service connections from the water main to the customer's service shall be made with new high molecular "poly" pipe (size as noted in details) I.P.S. SDR7 (200 psi). Any two-inch diameter services shall be supplied and installed with a two-inch diameter threaded gate valve, with valve box at the main. Two (2) inch PVC "sleeves" are required to be installed beneath roadway sections for new service lines.

4. FITTINGS:

a. Ductile Iron Fittings:

Fittings for ductile iron pipe shall be ductile iron or Class 250 gray iron conforming to AWWA C110 and C111, or ductile iron conforming to AWWA C153, and shall be cement-mortar lined conforming to AWWA C104 (ANSI Standard A21.4).

Rubber gaskets for push-on (Tyton) or mechanical joint (M.J.) in accordance with ANSI Standard A21.11 (AWWA C-111).

5. TAPPING TEE and TAPPING VALVE:

a. The tapping tee shall be ductile iron or Stainless Steel. The tapping valve shall meet the specifications of the gate valves or an approved equivalent.

6. CASING (MAIN LINE):

a. Welded steel pipe casing shall meet or exceed ASTM Designation A53 or comparable. Minimum wall thickness shall be determined by NBWD depending on local conditions and applications. Casing spacers (Cascade or owner approved equivalent) shall be installed per the manufacturer's recommendations. After installation and satisfactory testing of the main is

completed, the casing shall be backfilled with sand or grout and the ends plugged with concrete to prevent backing of materials.

7. FIRE HYDRANTS:

   a. Fire hydrants shall be a breakaway type and conform to AWWA Standard C502-73 and be the following make and model**:** M&H Model 929 or NBWD approved equal.

   b. They shall be non-rising stem compression-type which open counter-clockwise, and close with pressure. The main valve opening diameter shall be 5-1/4 inches and the hydrant barrel shall have a diameter of 7 inches unless otherwise specified. The hydrant seat and hydrant seat retaining ring shall be bronze. All external bolts, nuts and studs shall be cadmium plated in accordance with ASTM A165 Type HS. Gaskets shall be of rubber composition.

   c. Fire hydrants shall be equipped with one 4-1/2" NST pumper port with a 4" Storz adaptor and cap, and two 2-1/2" NST hose ports. Ports shall be fitted with renewable bronze nipples locked in place.

   d. The fire hydrants shall have a base primmer coat and painted with two (2) coats of Rustoleum Brand Fire Hydrant Paint, color Safety Yellow. See Standard Detail Fire Hydrant Assembly for additional specifications.

   e. Furnish and install one blue line marker at a location as determined in the field.

8. GATE and BALL VALVES:

   a. Valves 2-inch thru 12-inch shall be gate valves and conform with the requirements of AWWA Standard Specifications for gate valves for ordinary water works service number C-500 and C-509, except where superseded by the following:

   b. They shall be iron body with epoxy coating inside and out with fusion welded resilient rubber wedge seat. The valves shall be non-rising stem, open to the left "CCW", and shall be equipped with standard 2" square operating nuts. Valves shall be equipped with "O-ring" packing. Valves shall be M&H, Waterous, or Clow.

   c. 1-1/2" and smaller diameter valves shall be ball valves approved by NBWD. Said ball valves shall be equipped with a slotted operator, and with an adapting 2" square operating nut (Ford Cat. No. QT-67, or equal) secured with a stainless steel cotter pin.

9. BUTTERFLY VALVES:

   a. All valves larger than 12 inches shall be butterfly valves. Butterfly valves shall be Class 150 or better, either M&H 450 or 4500 or Pratt equivalent, and shall meet the requirements of AWWA C-504-70.

b. Valve shafts shall meet or exceed the strength requirements of AWWA C-504-70 and be one-piece. Packing shall be "O-ring", or other design approved by NBWD.

c. Butterfly valves to be installed underground shall have sealed mechanical operators, open to the left and have 2" standard square operating nuts.

d. Complete manufacturer's specifications for the valves proposed for use shall be submitted to NBWD for approval. No valves shall be used which have not been approved by NBWD.

10. BLOW-OFF ASSEMBLY:

a. Per NBWD standard plan for water system construction Section 4 for "Blow-off Assembly Details".

11. COUPLINGS:

a. Couplings 4" and larger shall only be used to join asbestos cement pipe to approved piping materials. The coupling shall have a 200-psi minimum working pressure rating; the body (middle ring) and followers shall be made from steel or ductile iron. The bolts and nuts shall be ANSI 304/303 Stainless Steel, or corrosion-resistant alloy bolts and nuts.

b. The coupling shall be Total Piping Solutions (TPS) – Hymax 2000, Dresser Style 253 Modular Cast Coupling, Smith Blair 413, or an approved equivalent.

c. The coupling shall have an NSF–61-registered fusion bonded powder epoxy coating, and shall meet all applicable requirements of AWWA C-219.

12. RETAINER GLANDS:

a. Mechanical Joint Restraints, 4 inch through 24 inch, shall meet or exceed the requirements of ASTM F1674 of the latest revision.

b. Retainer glands: Retainer glands shall be designed to impart multiple wedging action against the pipe, increasing its resistance as the pressure increases. Glands shall be manufactured of ductile iron conforming to ASTM A536-80.

c. Restraining devices shall be of ductile iron heat-treated to a minimum harness of 370 BHN. Twist-off nuts shall be used to insure proper actuating of the retainer gland. Dimensions of the gland shall be such that it can be used with the standard mechanical joint bell and tee-headed bolts conforming to ANSI/AWWA A21.1 and ANSI/WWA 153/A21.5

d. The retainer gland shall have a working pressure of 250 psi with a minimum safety factor of 2:1 and shall be certified by the manufacturer to be compatible with the pipe class and pipe manufacturer for all sizes provided on the job.

e. Mechanical joint retainer glands shall meet requirements of AWWA/ANSI C111/A21.11. Glands for ductile iron pipe shall be Mega-lug Series 1100 as manufactured by EBAA Iron MEGA-LUG System / Kit.
1104 to 1116, Painted Black MJ retainer gland for DI pipe.
1704 to 1716, Painted Black MJ retainer gland for DI pipe w/push on joints. 2004PV to 2012PV, Painted Red MJ retainer gland for PVC pipe.

f. A Mega-lug retainer gland system shall be used on all mechanical joints and shall meet UNI-B-13 for PVC and be UL/FM approved through twelve (12) inch diameter for both ductile iron and PVC pipe. As an alternate to the Mega-lug system, Ford Uniflange Series 1400 retainer glands and Series 1300 and 1390 joint restraints will be used. For PVC, Ford Uniflange Service 1500 retainer gland will be used or an approved equivalent.

g. Kits must consist of one gland, gasket, bolts, nuts, and grip ring and meet the requirements as outlined below.

h. Retainer Kits must be boxed and sealed and contents of box (part number, size of T-bolts, size of grip ring and gland, type of gland and type of gasket) must be clearly printed on outside of box.

13. AIR and VACUUM RELEASE ASSEMBLIES:

a. Per NBWD standard plan for water system construction Section 4.

14. VALVE BOXES:

a. Valves boxes shall be Rich 920 or NBWD approved equal and be cast iron with adjustable sections; 18" top section and regular 24" base section as required with a minimum inside diameter of 5 inches. A valve cover marked "WATER" shall be provided. Valve box "ears" shall be installed in the direction of flow.

15. VALVE STEM EXTENSIONS:

a. The materials for the valve stem extension shall be as shown on the standard detail.

16. CONCRETE MARKER POSTS:

a. A concrete valve marker post shall be 4" minimum square section and a minimum of 42" in length, with beveled edges and continuing at least one (1) 3/8" x 37" bar of reinforcing steel. Paint shall be as for fire hydrants (Section 8).

17. FIRE HYDRANT GUARD POSTS:

a. The guard posts shall be precast reinforced concrete, nine inches in diameter, six feet long. Paint shall be as for fire hydrants (Section 8).

18. LOCATING WIRE:

a. Locating wire shall be 14 gauge solid copper, with neoprene coating. All connections or splicing shall be made with ILSCO split bolt connectors, Catalog No. 1 KS, or equal.

19. METER BOXES:

a. Fog-Tite #1 Meter Seal Company or owner approved equal.

20. SERVICE SADDLES:

a. All service connections shall be installed with service saddles which shall be manufactured by Romac or owner approved equivalent, and as further specified in the Standard Details (Section 4 of this document).

21. METERS:

a. See Standard Details (Section 4 of this document) herein.

22. FOUNDATION GRAVEL:

a. Foundation gravel shall consist of standard 1-1/2-inch washed aggregate which is normally used as the coarse aggregate in concrete. This material shall not have a wear percentage exceeding fifteen percent (15%) in the abrasion test, ASTM Designation D-2 or D-289.

23. GRAVEL BASE:

a. This material shall conform to and be placed in accordance with Section 4-02 of the Standard Specifications for Road, Bridge & Municipal Construction, of the State of Washington, for gravel base formerly designated as Class "B". The material may also be used for select backfill of trenches, if and only if specifically approved by NBWD based on the approved location/installation of the pipeline.

3- METHODS OF CONSTRUCTION

1. GENERAL:

    a. A pre-construction conference will be held at NBWD office prior to the start of construction.

    b. The developer shall notify NBWD seven (7) calendar days in advance of proposed construction to allow for checking of materials, as may be applicable and warranted, to be used on the job.

    c. Except as otherwise noted herein, all work shall be accomplished with adopted standards of NBWD, as recommended in applicable American Waterworks Association (AWWA) specifications, and according to the recommendations of the manufacturer of the material or equipment used.

    d. The Contractor performing actual construction shall have a copy of the plans and specifications on the job site at all times.

2. ALIGNMENT:

    a. All new water mains shall be placed ten (10) feet north or east of the centerline of the street right-of-way in all new Plats and/or undeveloped rights-of-way. New water mains in and along existing roadways will be installed at a location approved by Pacific County. Unless otherwise specified, the location of the water mains, hydrants, valves, and principal fittings will be in accordance with the approved plans. The Developer shall provide sufficient horizontal control, in the form of centerline stakes, property corners, or other markers, as required for proper pipe location.

3. CLEARING and GRUBBING:

    a. Clearing and grubbing shall consist of the removal of all trees, stumps, brush, and debris and shall be confined within the limits of the easements obtained for the construction of this project, and/or existing public rights-of-way. Construction work in forested and native unimproved areas shall be conducted with extra precaution. Construction activity, stored materials and piles of earth shall not extend beyond the designated work limits. Trees and foliage which are not to be removed in construction shall be protected. Finish grades after completion shall match original grades, sloped to prevent ponding. Remove any surplus dirt or over burden piled around trees to prevent future damage; remove such material by hand if necessary. Clear and fell trees with sufficient care to prevent damage.

    b. All trees which are removed by the Developer shall become the property of the Developer and shall become his responsibility to remove from the site, unless otherwise noted in the easement stipulations or elsewhere in these specifications. Removal of clearing and grubbing debris shall be subject to the approval of NBWD and shall, in no way, constitute a hazard to the continuous operation of any existing utilities. Any damage to the existing utilities shall be repaired by the respective utility company, at the expense of the Developer. Any private improvements in the rights-of-way

and easement areas shall not be removed until permission has been given by NBWD.

c. All fences adjoining any excavation or embankment that may be damaged or buried shall be carefully removed and temporarily erected on the adjoining property or stored for reinstallation.

d. No debris of any kind shall be deposited in any stream or body of water, or in any street or alley. All waste material shall be hauled to a waste site arranged for by the Developer. Any permits required for disposal shall be secured and paid for by the Developer.

e. The Developer shall be responsible for all damage to existing improvements resulting from his operations.

EXCAVATION and BACKFILL:

4. Traffic to be Maintained:

   a. The Developer shall make safe provision for necessary traffic around, over, or across the work in progress and shall schedule pavement patching to follow after backfill is completed.

5. Excavating in Paved Areas:

   a. Prior to excavating in paved areas, the existing road surface shall be cut one (1) foot (minimum) back from the outer edge of the excavation with a cutter and removed. The cuts shall be made in clean, straight lines to insure a minimum of damage to existing pavements. All cuts in existing asphalt or concrete pavement shall be made with an approved concrete saw, except that where the concrete has been overlaid with asphalt, the pavement shall be cut with a cutter 1 foot (minimum) from the outer edge of the excavation on each side of the trench section. If the Developer fails to protect the trench edges during trenching and backfilling, it shall be required, at his own expense, to re-cut the edges prior to repairing the pavement.

6. Trench Excavation:

   a. Trench excavation shall be unclassified. The terms earthwork or excavation include all materials excavated or removed regardless of material characteristics. The Developer shall make his own estimate of the kind and extent of materials which will be encountered in the excavation.

   b. Trenches shall be excavated to the line and depth so that all new transmission pipelines constructed shall have not less than 42 inches and all new distribution pipelines constructed shall have not less than 36 inches, nor more than five (5) feet of cover, measured from the top of the pipe to the approved finished grade, unless otherwise approved by NBWD.

   c. If a grade revision is made, the cover over the water main must remain within these limits. Otherwise, the water main shall be reconstructed. All added costs of inspecting such water main reconstruction shall be charged to the Developer.

d. The excavation shall be made in a straight grade through localized breaks in grade. The excavation shall be deepened gradually at changes in the street grades so that there are no abrupt changes in pipeline grade.

e. Where it is necessary to cross sanitary sewer or storm sewer trenches, all trench backfill shall be removed and replaced with mechanically compacted granular material to provide a uniform support for the full length of the pipe.

f. The root systems of all trees not to be removed which are located on or near easements and rights-of-way shall not be cut or disturbed, but shall be tunneled or otherwise protected by the Developer to ensure that no damage is done.

g. During trenching, installing of pipelines and appurtenances, and the placing of backfill, trenches shall be kept free of water. The Developer shall furnish all equipment necessary to dewater the trench and shall dispose of the water in such a manner as not to cause a nuisance or menace to the public. At no time will ground or storm water, mud, miscellaneous debris, etc., be allowed to enter the pipeline being constructed.

h. When deemed necessary by NBWD, the trench shall be extended below the pipeline grades to permit the placing of foundation materials.

i. Foundation material (gravel, spalls, etc.) required in the bottom of the trench to provide proper pipe support shall be furnished by the Developer. The Developer shall perform all excavation of every description and of whatever substance encountered.

j. Boulders, rocks, roots, and other obstructions shall be completely removed or cut out to the new width of the trench and to a depth 6 inches below the water main grade. Where material is removed from below water main grade, the trench shall be backfilled to grade with material satisfactory to NBWD and thoroughly compacted.

k. The maximum length of open trench permissible on any line, in advance of pipe laying, will be 100 feet, unless otherwise specifically approved by NBWD Operations Manager.

l. Upon completion of work each day, all open trenches shall be completely backfilled, leveled, and temporarily graveled or patched, unless otherwise approved by NBWD.

7. Trench Backfill:

a. No timber bracing, lagging, sheathing, lumber or other trench shoring materials shall be left in any excavation.

b. At all roadway and driveway crossings, as well as below existing or future pavement sections, the trench shall be immediately backfilled and compacted with 100% crushed rock after the pipe is installed and inspected, and shall be immediately provided with a temporarily graveled

surface, and continually maintained on a daily basis until replaced with permanent repair as required.

c. All paved crossings shall have a temporary asphalt (cold mix) paved surface installed, which surface shall be a minimum of four (4) inches in compacted thickness, and fully maintained level with existing undisturbed pavement until replaced with permanent repair. Sufficient cold mix to make immediate repairs and to maintain repairs until permanent repair is made, shall be on the job site.

d. The Developer shall be responsible for restoring to a condition equal to their original or superior condition, any and all exiting culverts, ditches, drains, landscaping, or other facilities which are damaged as a result of the Developer's operations.

8. Timbering and Sheeting:

a. The Developer shall provide and install timbering and sheeting as necessary to protect workmen, the work, and existing utilities and other properties. All work involving timbering and sheeting shall be done in accordance with all applicable local, State and Federal safety regulations. All timbering and sheeting above the pipe shall be removed prior to backfilling. Sheeting below the top of the pipe may be cut off and left in place. Removal of timbering shall be accomplished in such a manner that there will be no damage to the work or to other properties. The design of all timbering and sheeting shall be the Developer's responsibility. Please see page 2-5, "Authority and Duties of Inspectors" in this regard.

9. Tunneling:

a. Tunneling may be ordered by NBWD and/or Pacific County under pavements or otherwise. The Developer may tunnel in lieu of open trenching for deep cuts. Except where authorized by NBWD, such tunneling shall not be longer than 20 feet between shafts. Tunneling shall not be less than 4 feet high and 2 feet wide and not less than 1 foot wider than the outside diameter of the pipe. Tunnels shall be backfilled with material acceptable to NBWD and Pacific County and backfill shall be mechanically compacted. Subsequent low pressure grouting may be required.

10. DEWATERING and CONTROL OF WATER:

a. The Developer shall dewater and dispose of the water so as not to cause injury to public or private property, or cause a nuisance or menace to the public.

b. Dewatering systems shall be designed and operated so as to prevent the removal of natural soils.

c. During excavating, installing of water mains, placing of trench backfill, and the placing and setting of concrete, excavations shall be kept free of water. The static water level shall be drawn down below the bottom of the excavation so as to maintain the undisturbed state of the natural soils, and allow the placement of backfill to the required density.

d. The dewatering system shall be installed and operated so that the groundwater level outside the excavation is not reduced to the extent that would damage or endanger adjacent structures or property.

e. The control, routing, storage, release, etc., of storm, ground, and or surface water shall be the Contractor's (Developer's) responsibility and be in strict conformance with all applicable regulatory agencies, applicable permits, and permit requirements. The Developer or his Contractor shall be responsible for obtaining and adhering to all relevant permits in this regard.

f. The release of groundwater to its static level shall be performed in such a manner as to maintain the undisturbed state of the natural foundation soils, prevent disturbance of compacted backfill, and prevent flotation or movement of structures, and water mains.

g. In carrying out the work within the limits of streams, or an area that will drain to a stream during a rain, the Developer is required to comply with the regulations of the appropriate local, State, and Federal agencies. Any isolated potholes remaining from the Developer's operations shall be provided with open water channels in such a manner that there will be a direct drainage outlet at the lowest elevation of the pothole.

h. Dust control water shall be applied as designated by NBWD and for such period of time as NBWD deems necessary.

i. The Developer shall contact the applicable agencies and secure such permits as may be necessary to cover his proposed method of operation within the areas described above. If no permit is necessary, and if deemed necessary by NBWD, he shall obtain a letter from the appropriate agency.

11. <u>COMPACTION of TRENCH BACKFILL:</u>

a. Unless otherwise approved in writing by NBWD Operations Manager, compaction of trench material is required. The density of compacted backfill material shall meet requirements outlined in the Standard Specifications, or as otherwise approved in writing by NBWD. The Contractor shall provide, procure and employ a NBWD approved soils laboratory to perform density tests of areas specified by NBWD. Any area which demonstrates non-compliance shall be excavated and re-compacted to the satisfaction of NBWD.

12. <u>TRENCH SAFETY SYSTEMS:</u>

a. All trenches which exceed a depth of four feet shall be provided with safety systems that meet the requirements of the Washington Industrial Safety & Health Act, Chapter 49.17 RCW.

FOUNDATION, BEDDING, and BACKFILL GRAVEL:

13. Bedding Material:

a. Bedding material shall be carefully placed and firmly compacted to provide a firm, uniform cradle for the pipe. The minimum thickness of the required bedding material layer shall be six inches for pipelines greater than 18 inches, 4 inches under the bell for all pipe sizes of 18 inches and smaller, and 6 inches under the bell for all pipe diameter where rock is excavated.

b. To provide this firm, continuous support for the pipe, it shall be necessary to hand tamp or "slice" bedding material solidly under the pipe. NBWD reserves the sole right to require the installation of pipe bedding based on actual field conditions. Failure of the contractor to install the material when deemed necessary by NBWD shall be cause for rejection of the installation by NBWD.

c. After the pipe laying operation, additional bedding material shall be placed and compacted for the full width of the trench up to the crown of the pipe.

14. Trench Backfill Gravel Base:

a. NBWD may evaluate and approve, on a case-by-case basis, the utilization of suitable excavated material or import gravel base material for trench backfill. When so approved (in writing) suitable excavated material and/or gravel base, as specified in Section 4-02 of the Standard Specifications; or granular material commonly known as pit run gravel, may be utilized in those areas specifically approved by NBWD Operations Manager.

b. Trench backfill shall be free from wood, roots, bark, or other extraneous material. It shall have such characteristics of particle size and shape that it will compact readily to a firm, stable base. The maximum size of stone in the backfill shall not exceed that which will pass a 2-1/2 inch square sieve opening. Unless otherwise approved, gradation shall be as follows: 25 percent minimum passing 1/4 inch sieve; 10 percent minimum passing U.S. No. 200 sieve; dust ratio 2/3 maximum; sand equivalent 30 minimum.

15. WATER PIPE / SERVICE INSTALLATION:

a. All pipe shall be installed in accordance with these specifications and the instructions of the manufacturer, subject to the approval of NBWD. All pipe ends shall be square with the longitudinal axis of the pipe, and any damage to the ends shall be cut off prior to installation, if approved by NBWD. When it is necessary to cut the pipe, the pipe shall be cut with approved cutting tools.

b. The pipe shall be laid in a straight grade through localized breaks in grade. The excavation shall be deepened gradually at changes in street grades so that there are no abrupt changes in pipeline grade. To maintain the required alignment, use short lengths and deflect the joints or use necessary bends.

c. Each pipe section shall be carefully lowered into place onto bedding material that is placed to a minimum depth of four inches in the trench after inspecting it for defects and removing any gravel or dirt, etc., from the interior of the pipe.

d. When necessary, water mains to be constructed under other utilities shall meet the minimum cover requirements. Where it is necessary to cross sanitary sewer or storm drain trenches, all trench backfill shall be removed and replaced with mechanically compacted granular material to provide a uniform support for the full length of the pipe.

e. The Washington State Department of Health (DOH) requires a 10-foot horizontal separation between all sanitary sewer lines and all septic drain fields relative to all water mains and service lines. Furthermore all potable water lines must be positioned above all non-potable water lines whenever possible.

f. Whenever this horizontal separation of 10-foot cannot be achieved for residential / commercial water mains and or water services or when the service line is located below a non-potable water source, a double check assembly shall be installed downstream of the service meter at Developer / Homeowners expense. Furthermore the service line between the double check valve assembly and 10-feet past the non-potable water source shall be sleeved and sealed via a water tight sealer. A 5-foot horizontal separation is required between all water facilities and underground power, telephone, and other facilities unless otherwise approved. These dimensional separations shall be adhered to unless otherwise approved by NBWD.

g. Where a water line crosses over a wastewater (non-potable) line, use a full joint of pipe and center over the wastewater providing 18 inch separation. Where a water line is to be parallel to wastewater, lay it at least 10 feet from the wastewater. If it is not practical for the water and wastewater lines to be separated as described above, then lay the water line at least 18 inches above the top of the wastewater.

h. Section 3-15 paragraph e. - Is further governed and regulated by the NBWD Cross Connection Policy and related plans and documentation.

16. <u>ROAD and STREAM CROSSINGS:</u>

a. The Developer may use any method which produces satisfactory results, and is acceptable to NBWD and the regulatory agencies having jurisdiction of the road or stream, provided that the Developer restores the road or stream to its original or superior condition. Normally, highway and stream crossings require the placing of a steel pipe casing by jacking or tunneling and laying the water main inside the casing.

b. Steel casing shall be of sufficient diameter, size, and strength to enclose the water main and to withstand maximum highway loading. Sizing and wall thickness of the casing shall be subject to approval by NBWD and/or Pacific County.

c. Sand backfill between the casing and the water main, or other NBWD approved means of pipe support, will be required. The ends of the casing are to be sealed with grout concrete after installation, backfill, and testing of the pipe are completed.

17. EROSION CONTROL:

a. The contractor/developer shall prepare and submit an erosion control plan for NBWD's review, comment, and approval prior to initiating construction activities. The detrimental effects of erosion and sedimentation are to be minimized in conformance with the following general principles:

i. Leaving soil exposed for the shortest possible time.

ii. Reducing the velocity and controlling the flow of run-off.

iii. Detaining run-off on the site to trap sediment.

iv. Releasing run-off safely to downstream areas.

b. In applying these principles, the Developer shall provide for erosion control by conducting work in workable units; minimizing the disturbance to cover crop material, providing mulch and/or temporary cover crops, sedimentation basins, and/or diversions in critical areas during construction; properly controlling and conveying run-off; and establishing permanent vegetation and installing erosion control structures as soon as possible.

18. Trench Mulching:

a. Where, in the opinion of NBWD, there is danger of backfill material being washed away due to steepness of the slope along the direction of the trench, material shall be held in place by covering the disturbed area with straw and holding it in place with a covering of jute matting or wire mesh anchored down with wooden stakes, or as may otherwise be approved by NBWD.

19. Cover Crop Seeding:

a. A cover crop shall be sown in all areas disturbed or excavated during construction that were not paved, landscaped, and/or seeded prior to construction. Areas landscaped and/or seeded prior to construction shall be restored to their original condition. Cover crop seeding shall follow backfilling operations.

b. The Developer shall be responsible for protecting all areas from erosion until the cover crop affords such protection. The cover crop shall be reseeded, if required, and additional measures taken to provide protection from erosion until the cover crop is capable of providing protection.

20. CONCRETE BLOCKING:

a. Concrete blocking mix shall be Cement Concrete Class 3000, it shall be cast in place and have a minimum of 1/4 square foot bearing against the fittings and two square feet bearing against undisturbed soil. Blocking shall bear against fittings only and shall be clear of Joints so as to permit taking up or dismantling the joint. All bends and tees shall be adequately blocked. Minimum sized blocks are shown in the Standard Blocking Details. The developer shall install blocking which is adequate to withstand full test pressure as well as to continuously withstand operating pressures under all conditions of service.

b. For concrete blocking based on 200 psi test pressure, with safe soil load bearing of 2,000 pounds per square foot, see Standard Details (Section 4) for minimum dimensional requirements. The Developer shall be responsible for determining the actual size of blocking based on local conditions.

c. Calculations for same shall be provided to NBWD for verification of same and stamped by a Washington State licensed engineer employed by the Developer. Pea gravel or other smooth surfaced rocks are not acceptable as concrete mix aggregate.

21. FIRE HYDRANT INSTALLATION:

a. Fire hydrants shall be set as shown in the Standard Detail (Section 4 of this document). Shackle rods or Mega-lugs shall be used. The hydrant and gate valve must have lugs. Fire hydrant ports are to be oriented as determined by Pacific County Fire District No. 1.

b. In some instances, it may be necessary to provide cuts and fill hydrants. Where this occurs, the area for at least a three (3) foot radius around the hydrant shall be graded and leveled, and the cut or fill slopes shall be neatly graded by hand, unless otherwise approved by Pacific County Fire District No. 1.

c. No tool other than an approved hydrant operating wrench shall be used when opening or closing hydrants. Existing hydrants shall not be operated by the Contractor.

d. Existing fire hydrants shall be relocated, as shown on the Standard Details (Section 4), by installing new fittings, new ductile iron pipe and Mega-lugs between the gate valve and the fire hydrant. New gaskets shall be installed at each connection.

22. WATER SHUTOFF:

a. Where it is necessary to shut off the existing mains to make a connection, the Developer shall notify NBWD Operations Manager seventy-two (72) hours in advance of such shut off and NBWD will shut off the mains. Once the water has been shut off, the Developer shall diligently pursue the connection to completion so that the time required for the shut off may be held to a minimum.

b. All connections to existing mains shall be completed the same day as they are started. The Developer shall time his operations so that the water will not be shut off overnight or over weekends or during holidays. On shutdowns effecting commercial or emergency service, connections during non-peak periods may be required (at the discretion of NBWD), for example weekends or midnight hours.

23. SERVICE CONNECTIONS:

a. Prior to construction of the new water mains, and if so directed by NBWD, the Developer shall remove, tag and deliver existing meters to NBWD and provide an approved and temporary jumper (idler) for existing meter locations in order to maintain service. NBWD staff will then inspect and overhaul the meters, and deliver them to the construction site when the Developer is ready to reinstall the meters.

b. Any relocated meters shall be installed at the property line. A new meter box, per NBWD Standards, shall be furnished by the Developer for each service. Any meters damaged or clogged during construction will be replaced by NBWD and back charged to the Developer.

c. Service lines shall be installed up to the meter prior to conducting pressure testing and disinfection of water mains, the services shall then be connected to meters.

24. GATE VALVE INSTALLATION:

a. Gate valves shall be set in the ground vertically and shall be opened and shut under pressure to check operation and, at the same time, show no leakage. Valves 6 inches and larger that are not flanged to other fittings shall be blocked in accordance with the Standard Details (Section 4). Concrete collars shall be placed around the valve boxes as also shown and referenced in the Standard Details.

25. BUTTERFLY VALVE INSTALLATION:

a. Butterfly valves shall be installed and tested in the same manner as gate valves. The Contractor is cautioned to test Butterfly Valves in strict compliance with manufacturer's recommendations. Test pressures may need to be adjusted accordingly.

26. VALVE BOX INSTALLATION:

a. Valve boxes shall be set flush in pavement. In gravel shoulder and in unimproved roadway areas, install a protective asphalt pad as shown in Standard Details. Valve boxes shall be installed such that the slots in the valve box lid shall be oriented in the direction of the pipe. Where valve boxes are in asphaltic pavement, the cover shall be painted Blue.

27. INSTALLATION of VALVE MARKER POSTS:

a. Valve markers shall be installed for all valves except fire hydrant valves and NBWD designated valves located in paved areas. The markers shall be set to leave 18 inches exposed above ground. The exposed portion of the markers shall be painted the same as the fire hydrants. The valve size and the distance to the valve, rounded off to the nearest foot, shall be stenciled on the marker in two-inch-high numbers using black paint. A single valve marker can be utilized to identify valve clusters.

28. INSTALLATION of FIRE HYDRANT GUARD POSTS:

a. Guard posts shall be set with the tops of the posts at the same elevation as the top of the hydrant. The exposed portion of the posts shall be painted same as for fire hydrants.

29. BLOW-OFF ASSEMBLY INSTALLATION:

a. Per NBWD standard plans for water system construction for "End-Line and In-Line Blow off Assemblies" as applicable.

30. AIR and VACUUM RELEASE VALVE INSTALLATION:

a. Air and vacuum release valve assemblies shall be sized and approved by NBWD and installed as shown in the Standard Details (Section 4). Location of air and vacuum release valves shall be at localized high points of the system. Air and vacuum release assemblies shall be installed in a location as "approved" by NBWD Operations Manager. Where required by NBWD Operations Manager, the new main shall be constructed with additional depths of cover to alleviate the need for these types of valve assemblies at localized system high points.

31. LOCATING WIRE:

a. All non-metallic water mains (service laterals) and services shall have 14 gauge solid copper wire and neoprene coating placed in the trench over the water line and the ends brought up into the valve or meter boxes.

32. CONNECTIONS TO EXISTING FACILITIES:

a. Unless otherwise specified by NBWD, where it is necessary to connect to existing facilities, the operation of the existing facility shall be maintained, if possible, while making the connection.

b. Wet tap connections shall be installed as shown on the approved Plans and further detailed in the Standard Details (Section 4). The tapping valve shall remain closed and operated only as directed by NBWD.

c. Cut-in tees and crosses shall be installed as shown on NBWD approved Plans and the valves on the branches of the tee or cross shall remain closed unless otherwise directed by NBWD. Unless otherwise specifically approved by NBWD, in writing, a maximum of one (1) connection to the existing system will be allowed until such time that pressure and purity tests of the "completed" system have been satisfactorily witnessed by

NBWD. NBWD will determine and approve of the initial "tie in" prior to constructing same.

d. At connections of new piping to existing piping where no valve is installed to separate the system, all of the new piping, appurtenances and blocking shall have been installed, disinfected and tested up to the point of cutting into the existing line before the connection is made.

e. Provide NBWD Operation Manager 72 hours notice prior to making connections to the existing system and proceed only after receiving permission. Assemble all necessary material and equipment 48 hours before starting work to allow NBWD inspector to examine the material for acceptability. NBWD will notify all affected customers. Generally, no cut-in connections or connections of new piping to existing piping will be scheduled on, weekends, NBWD recognized holidays, or non-work hours unless otherwise approved (in writing) or required by NBWD.

f. Bolts, flanges, gaskets, couplings and all accessories shall be checked and assembled where possible by the Developer and verified by NBWD prior to shut down of the water system. Before connection or cut-in, the fittings, pipes, valves, and couplings shall be cleaned and sterilized with chlorine solution in the same manner as provided for the pipeline. The cleaning and sterilizing shall be done immediately prior to installation and in the presence of NBWD. Once the water has been shut off, the Developer shall proceed rapidly and without interruption to complete the connection.

g. After connection to the existing system, the opening of the valves shall be done with the authorization of, and in the presence of, NBWD's authorized representative.

h. The Developer shall not operate any valves or make any connections to the existing water main without prior approval of NBWD. The Developer shall make the necessary arrangements with NBWD for the connection to the existing water main.

33. <u>TESTING and DISINFECTING:</u>

a. The water main pipes shall be substantially disinfected, purged and tested before being placed in service. All water for testing and disinfecting must be obtained by the Developer by arrangement with NBWD. All pumps, gauges, plugs, saddles, corporation stops, miscellaneous hose and piping, and measuring equipment necessary for performing the test shall be furnished, installed and operated by the Developer. When testing, "feed" for the pump shall be from a barrel or other suitable container, wherein the actual amount of "makeup" water can be measured periodically during the test period.

b. The pipeline shall be backfilled sufficiently to prevent movement of the pipe under pressure. All concrete blocking shall be in place and time allowed for the concrete to cure before testing. Where permanent blocking is not required, the Developer shall furnish and install temporary blocking.

c. The pipeline shall be subjected to a hydrostatic pressure test of 200 pounds per square inch (200 psi) or twice the system static pressure (whichever is

greater) for a period of not less than fifteen (15) minutes for all lines with gate valves 12-inch and smaller. **All pipelines with valves larger than 12-inch shall be tested to one hundred fifty pounds per square inch (150 psi) maximum.** All tests shall be made with the hydrant auxiliary gate valves open and pressure against the hydrant valve. Hydrostatic tests shall be performed on every complete section of water main between two valves, and each valve shall withstand the same test pressure as the pipe with no pressure active in the section of pipe beyond the closed valve.

d. The hydrostatic testing and leakage tests shall be satisfactorily completed and witnessed by NBWD after pavement restoration and/or new pavement installation is complete. The Contractor is strongly advised to test the system to its satisfaction in this regard prior to installation of permanent surface restoration items. Fire hydrants shall be individually tested at the conclusion of the water main testing to the same test pressures previously identified. The individual hydrant testing shall be performed with the hydrant auxiliary gate valve and hose ports closed and the hydrant operating stem valve wide open. A maximum of 25 pounds per square inch shall be in the supply main beyond the hydrant auxiliary gate valve.

e. In addition to the hydrostatic pressure test, a leakage test shall be conducted on the pipeline. The leakage test shall be conducted at one hundred fifty pounds per square inch (150 psi) for a period of not less than two (2) hours.

f. The quantity of water lost from the main shall not exceed the number of gallons per hour determined by the formula:

$$L = \frac{ND(P)^{0.5}}{7{,}400}$$

In which L = allowable leakage, gallons/hour
N = number of joints in the length of pipeline tested
D = nominal diameter of the pipe in inches
P = average test pressure during the leakage test, psi.

g. Defective materials or workmanship, discovered as a result of the tests, shall be replaced by the Developer at the Developer's expense. Whenever it is necessary to replace defective material or correct the workmanship, the tests shall be rerun at the Developer's expense, until a satisfactory test is obtained.

h. The pipe shall also be disinfected when being tested. As each length of pipe is laid, calcium hypochlorite or other disinfecting agent, having an available chlorine content of approximately sixty-five (65) percent shall be placed in the pipe in sufficient quantities to give a dosage of approximately fifty (50) parts per million available chlorine, calculated on the volume of water which the pipe will contain.

i. This may be placed in the upstream or high pressure end of the pipe. The following table shows the amount of high test calcium hypochlorite which should be used in each twenty (20) foot length of pipe of various sizes:

j. PIPE SIZE HIGH TEST HYPOCHLORITE REQUIRED

(Inside Diameter In Inches)	(Ounces per 20-foot length to give 50 ppm available chlorine)
2, 3, 4 & 6	0.4
8, 10 & 12	0.7

k. The calcium hypochlorite or other disinfecting agent used for this purpose shall be furnished by the Developer.

l. When the line is completed and ready to disinfect, water shall be allowed to flow in slowly, so not to displace the chlorine agent, until it appears at the far end of the line. The system shall then be allowed to stand for at least twenty-four (24) hours but not to exceed forty-eight (48) hours (unless otherwise approved by NBWD Operation Manager). The line shall then be flushed through the fire hydrants or into the next section, until a test shows no more than 0.2 parts per million available chlorine.

m. If any of the materials need to be replaced, the line shall again be disinfected and tested. The line may not be pressure tested at the same time it is disinfected unless specifically approved by NBWD Operations Manager.

n. Adequately sized and spaced blow-offs, including temporary blow-offs, if approved by NBWD, shall be provided to insure minimum flushing velocities can be maintained in the pipe per applicable AWWA standards and provisions.

o. The water system will not be acceptable to NBWD until receipt of a satisfactory report from the Washington State Department of Health (DOH) on water samples submitted to that office for bacteriological analysis, or other certified laboratory(ies).

p. The hypo-chlorinated water shall be discharged in strict compliance with regulatory guidelines and requirements. The contractor shall be responsible for procuring all permits, making adequate provisions, and incurring all costs in this regard, to include, but not be limited to, NBWD approval of point and method(s) of discharge, hoses, trenching, hauling, etc.

34. ADJUSTMENT of NEW and EXISTING UTILITY STRUCTURES TO GRADE:

a. This work consists of constructing and/or adjusting all new and existing utility structures encountered on the project to finished grade.

General:

b. On asphalt concrete paving projects, the valve boxes shall not be adjusted until the pavement is completed, at which time the center of each valve box lid shall be relocated from references previously established by the Developer. The pavement shall be cut as further described, and base material removed to permit removal of the lid.

c. The asphalt concrete pavement shall be cut and removed to a neat circle, as further noted herein, and shown in the Standard Detail. The valve box and lid shall be brought up to desired grade, which shall conform to the surrounding road surface. A concrete collar shall be placed per the Standard Detail. Care shall be exercised to insure the valve box "ears" point in the direction of the new water main on which it is installed.

d. Asphalt concrete patching shall not be carried out during wet ground conditions or when air temperature is below 50 degrees F. Asphalt concrete mix must be at the required temperature when placed. Before making the asphalt concrete repair, the edges of the existing asphalt concrete pavement and the outer edge of the casting shall be tack coated with hot asphalt cement. The remaining 2" shall then be filled with Class B asphalt concrete and compacted with hand tampers and a patching roller.

e. The completed patch shall match the existing paved surface for texture, density, and uniformity of grade. The joint between the existing pavement and the patch shall then be carefully painted with hot asphalt cement or asphalt emulsion, and shall be immediately covered with dry paving sand before the asphalt cement solidifies. All debris, such as asphalt pavement, cement bags, etc., shall be removed and disposed of by the Developer. Before acceptance of the job, valve and meter boxes shall be cleaned of all debris and foreign material. Any damage occurring to the existing facilities due to the Developer's operations shall be repaired at his own expense.

f. Adjustment of Monuments and Cast Iron Frames and Covers:

    i. Monuments and monument castings shall be adjusted to grade in the same manner as for valve boxes.

35. FINISHING and CLEANUP:

a. Before acceptance of water main construction, all pipes, catch basins, and other surrounding facilities shall be cleaned of all debris and foreign material. After all other work on the project is completed, and before final acceptance, the entire roadway, including the roadbed, planting and sidewalk areas, shoulders, driveways, alley and side street approaches, slopes, ditches, utility trenches, and construction areas shall be neatly finished to the lines, grades, and cross-sections shown on the plans and as hereinafter specified.

b. On water main construction where all or portions of the construction is in undeveloped areas, the entire area which has been disturbed by the construction shall be so shaped that, upon completion, the area will present a uniform appearance, blending into the contours of adjacent properties. All other requirements outlined previously shall be met. Slopes, sidewalk areas, planting areas, and roadway shall be smoothed and finished to the required cross-section and grade by means of a grading machine insofar as it is possible to do so without damaging existing improvements, trees and shrubs. Machine dressing shall be supplemented by hand work to meet the requirements herein, to the satisfaction of NBWD.

c. Upon completion of the cleaning and dressing, the project shall appear uniform in all respects. All graded areas shall be true to line and grade as shown on the typical sections and as required by NBWD or Pacific County. When the existing planting is below sidewalk and curb, the area shall be filled and dressed out to the walk regardless of the limits shown on the plans. Wherever fill material is required in the planting area, it shall be left enough higher to allow for final settlement, but nevertheless, the raised surface shall present a uniform appearance.

d. All rocks in excess of six (6) inches in diameter unless used as ornamental or landscaping rock shall be removed from the entire construction area and shall be disposed of in the same manner as required for other waste material. In no instance shall the rock be thrown onto private property. Overhang on slopes shall be removed and slopes shall be dressed neatly so as to present a uniform, well sloped surface.

e. All excavation material at the outer lateral limits of the project shall be removed entirely. Trash of all kinds resulting from the clearing and grubbing or grading operations shall be removed, and disposed of at Contractor's prearranged location. Where machine operations have broken down brush and trees beyond the lateral limits of the project, the Developer shall remove, dispose of and replace the same as applicable at his own expense.

f. Drainage facilities, such as catch basins, inlets, culverts, and open ditches, shall be cleaned of all debris which is the result of the Developer's operations.

g. All pavements and oil mat surfaces, whether new or old, shall be thoroughly cleaned. Existing improvements, such as Portland cement concrete curbs, curb and gutters, walls, sidewalks, and other facilities which have been sprayed by the asphalt cement shall be cleaned to the satisfaction of NBWD.

h. Castings for manholes, monuments, water valves, lamp poles, vaults, and other similar installations which have been covered with the asphalt material shall be cleaned to the satisfaction of NBWD.

36. FINAL INSPECTION:

a. The Developer shall bear all costs incurred in correcting any deficiencies found during inspection, including the cost of any additional inspection that may be required by NBWD to verify the correction of said deficiency.

37. GENERAL GUARANTEE and WARRANTY:

a. The Developer shall be required, upon completion of the work, and acceptance by NBWD, to furnish to NBWD a written guarantee covering the material and workmanship for a period of one year after the date of final acceptance, and he shall make all necessary repairs during that period at his own expense, if such repairs are necessitated as a result of furnishing, under this agreement, poor materials and/or workmanship. The Developer shall obtain warranties from the contracts, subcontractors, and suppliers of material or equipment where such warranties are specifically

required herein, and shall deliver copies of same to NBWD upon completion of the work.

38. SALVAGE:

a. When directed by NBWD (or shown on the approved construction plans), the Contractor shall salvage all abandoned fire hydrants, valve boxes, valve marker posts, hydrant guard posts and other related appurtenances and/or pipe, and deliver the material to NBWD. The Contractor shall pre-arrange delivery with NBWD's Operation Manager. Do not use salvaged materials in new construction unless approved in writing by NBWD. Remove hydrants by first cutting the supply pipe to avoid damage to the hydrant. The abandoned pipe shall be provided with a concrete plug and the excavation trench shall be satisfactorily backfilled and compacted. Excess waste shall be removed and wastehauled by the Contractor.

SECTION 3

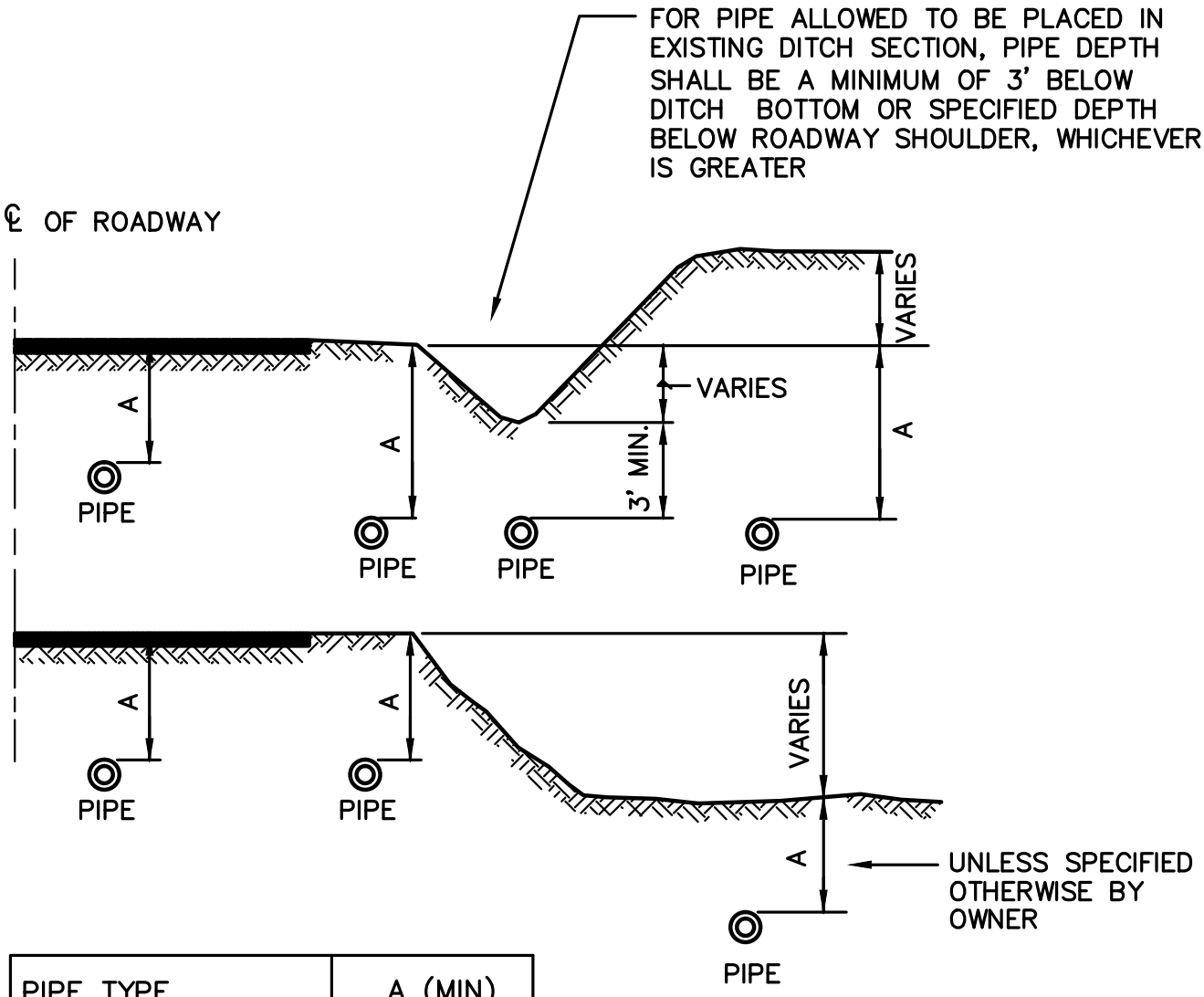
WATER MAIN STANDARD DETAILS

SECTION THREE

NORTH BEACH WATER DISTRICT

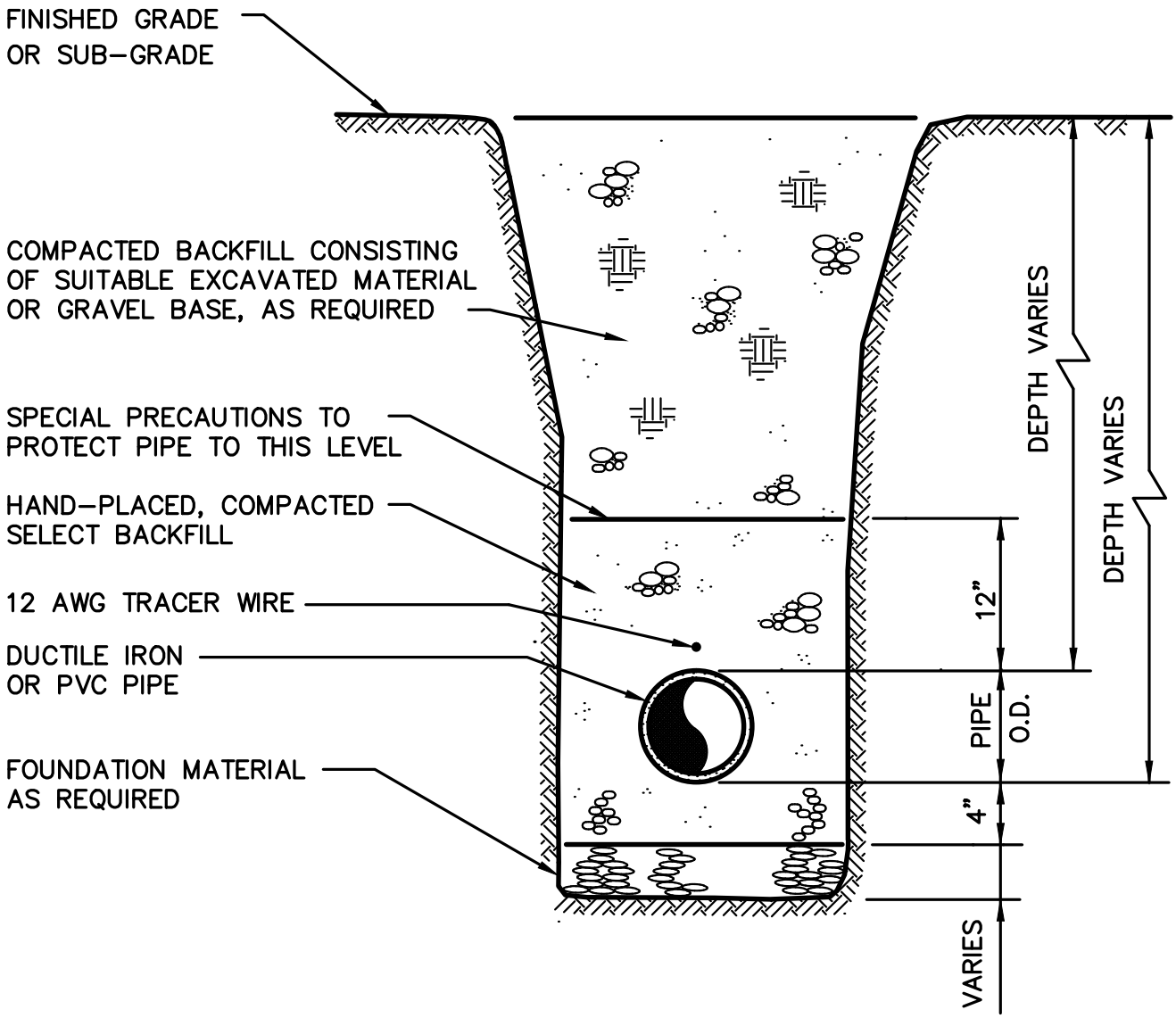
WATER MAIN STANDARD DETAILS

INDEX



PIPE TYPE	A (MIN)
TRANSMISSION	42"
DISTRIBUITION	36"

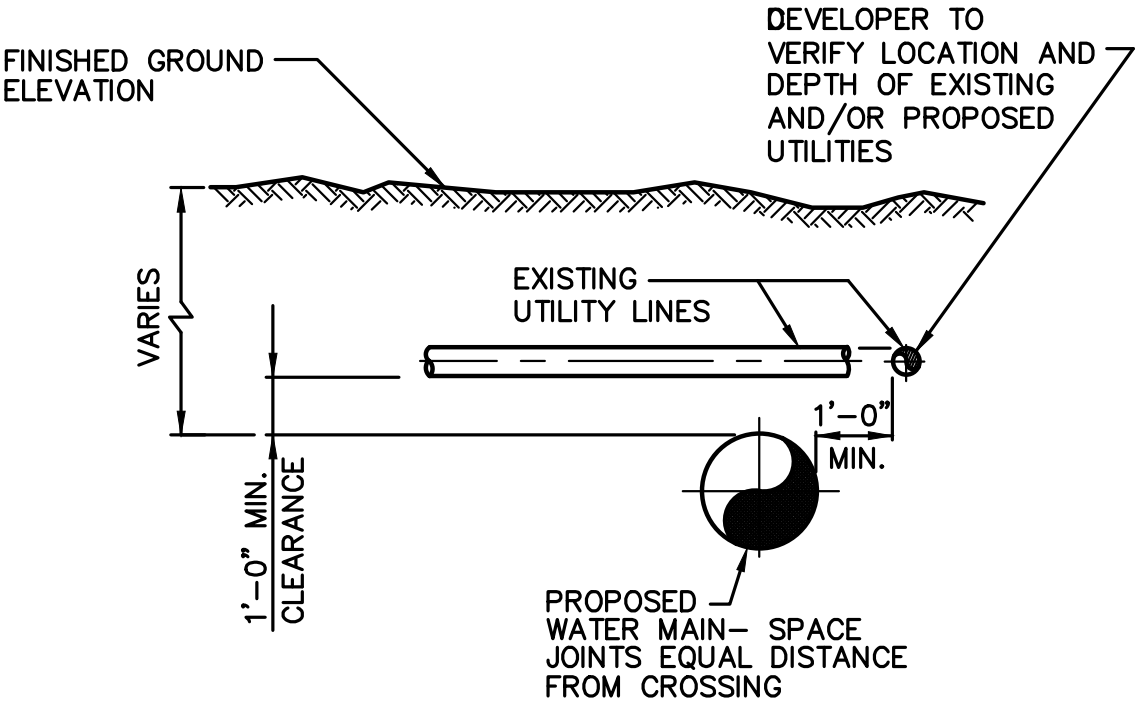
NORTH BEACH WATER DISTRICT WATER STANDARD DETAILS			
WATER MAIN DEPTH REQUIREMENTS			
APPROVED: GENERAL MANAGER _____ DATE _____			DWG. NO. 1
DATE: 10/14	DRWN: C.D.G.	CHKD: K.W.J.	SCALE: NONE



NOTE:

BACKFILL MATERIAL AND COMPACTION SHALL BE IN CONFORMANCE WITH NBWD STANDARDS AND/OR THE PACIFIC COUNTY PERMIT REQUIREMENTS, AS MAY BE APPLICABLE

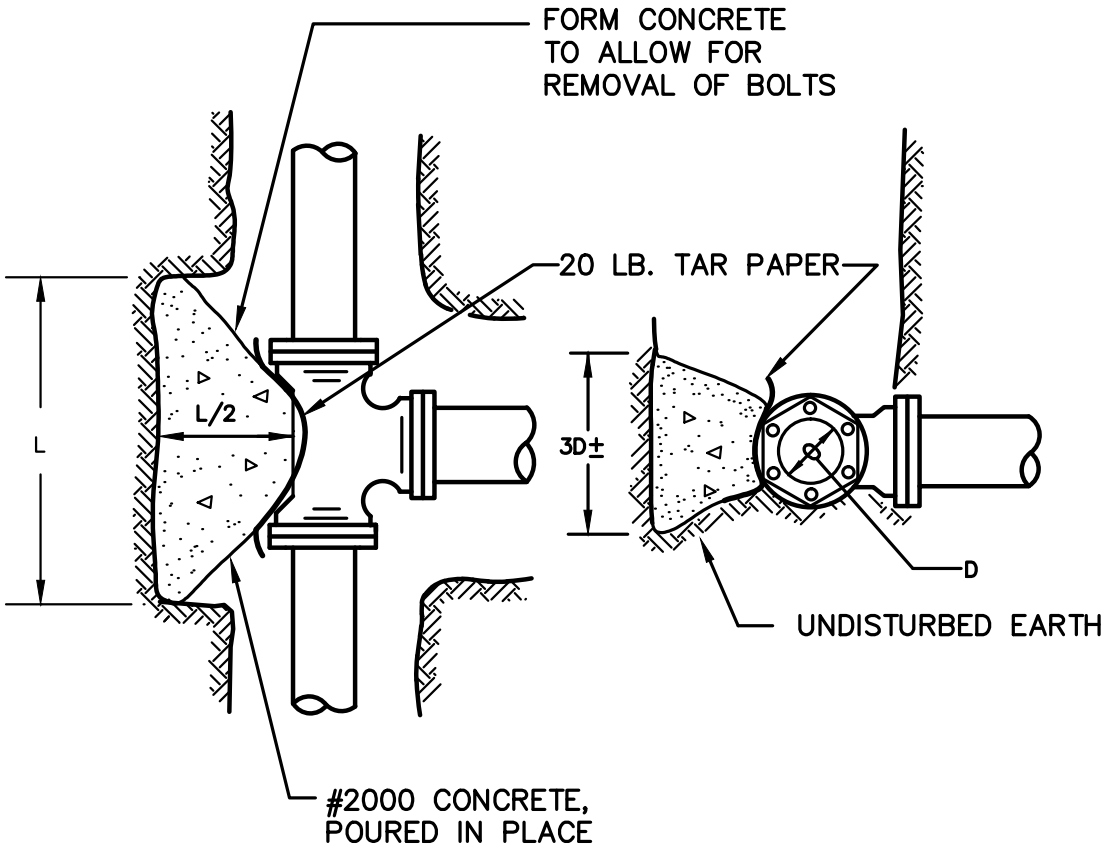
NORTH BEACH WATER DISTRICT WATER STANDARD DETAILS			
WATER MAIN TRENCH SECTION			
APPROVED: GENERAL MANAGER _____ DATE _____			DWG. NO. 2
DATE: 10/14	DRWN: C.D.G.	CHKD: K.W.J.	SCALE: NONE



NOTE: CONCRETE ENCASEMENT (BEDDING) SHALL BE UTILIZED, IF APPROVED BY THE OWNER, AT LOCALIZED UTILITY CROSSING IF MINIMUM PIPE SEPERATION (ELEVATION) CANNOT BE MAINTAINED / ACHIEVED.

NORTH BEACH WATER DISTRICT WATER STANDARD DETAILS			
TYPICAL UTILITY CROSSING			
APPROVED: GENERAL MANAGER _____ DATE			DWG. NO. 3
DATE: 10/14	DRWN: C.D.G.	CHKD: K.W.J.	SCALE: NONE

MINIMUM BEARING AREA TABLE					
FITTING D	TEE	90°	45°	22 1/2°	11 1/4°
6"	4 SQ.FT.	6 SQ.FT.	3 SQ.FT.	2 SQ.FT.	2 SQ.FT.
8"	7 SQ.FT.	10 SQ.FT.	6 SQ.FT.	3 SQ.FT.	2 SQ.FT.
10"	10 SQ.FT.	15 SQ.FT.	9 SQ.FT.	5 SQ.FT.	3 SQ.FT.
12"	14 SQ.FT.	22 SQ.FT.	12 SQ.FT.	6 SQ.FT.	4 SQ.FT.
16"	25 SQ.FT.	38 SQ.FT.	21 SQ.FT.	11 SQ.FT.	7 SQ.FT.
18"	32 SQ.FT.	48 SQ.FT.	27 SQ.FT.	14 SQ.FT.	8 SQ.FT.



PLAN **ELEVATION**

NOTE:
BEARING AREA TABLE BASED ON 250 PSI PRESSURE AND 2000 PSF SOIL BEARING. IF PRESSURE IS GREATER OR SOIL BEARING IS LESS, THE THRUST BLOCK SIZE SHALL BE INCREASED.

THIS TABLE REPRESENTS THE "MINIMUM" CONSTRUCTION STANDARDS. THE DEVELOPER'S ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING THE APPROPRIATE SIZE OF ALL THRUST BLOCKS BASED ON EXISTING AND LOCAL CONDITIONS.

NORTH BEACH WATER DISTRICT WATER STANDARD DETAILS			
CONCRETE THRUST BLOCK			
APPROVED: GENERAL MANAGER _____ DATE			DWG. NO. 4
DATE: 10/14	DRWN: C.D.G.	CHKD: K.W.J.	SCALE: NONE

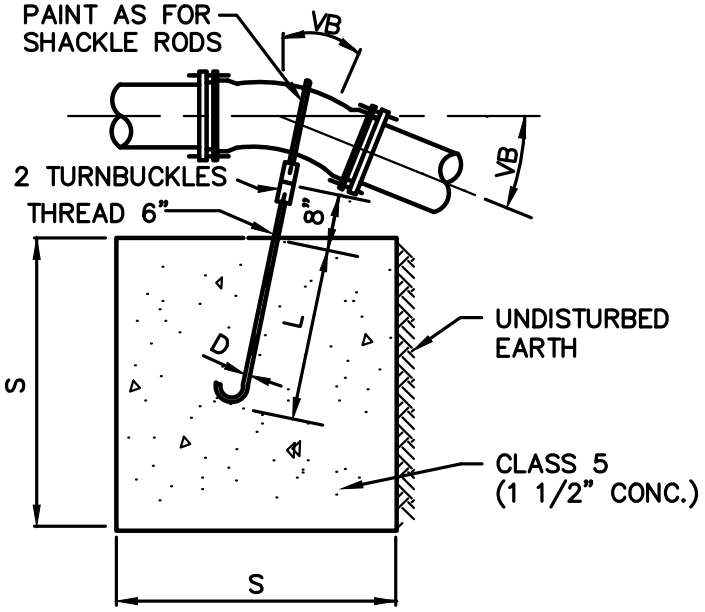
TYPE "A" BLOCKING
FOR 11 1/4°–22 1/2°–30° VERTICAL BENDS

PIPE SIZE NOMINAL DIAMETER– INCHES	TEST PRESSURE PSI	VB VERTICAL BEND DEGREES	No. OF CU. FT. OF CONC. BLOCKING	S SIDE OF CUBE LIN. FT.	D DIAM. OF SHACKLE RODS (2) INCHES	L DEPTH OF RODS IN CONCRETE LIN. FT.
4"	300	11 1/4	8	2	5/8"	1.5
		22 1/2	11	2.2		2.0
		30	17	2.6		
6"	300	11 1/4	11	2.2	5/8"	2.0
		22 1/2	25	2.9		
		30	41	3.5		
8"	300	11 1/4	16	2.5	5/8"	2.0
		22 1/2	47	3.6		
		30	70	4.1	3/4"	2.5
12"	250	11 1/4	32	3.2	5/8"	2.0
		22 1/2	88	4.5	7/8"	3.0
		30	132	5.1		
16"	225	11 1/4	70	4.1	7/8"	3.0
		22 1/2	184	5.7	1 1/8"	4.0
		30	275	6.5	1 1/4"	
20"	200	11 1/4	91	4.5	7/8"	3.0
		22 1/2	225	6.1	1 1/4"	4.0
		30	330	6.9	1 3/8"	4.5
24"	200	11 1/4	128	5.0	1"	3.5
		22 1/2	320	6.8	1 3/8"	4.5
		30	480	7.9	1 7/8"	5.5

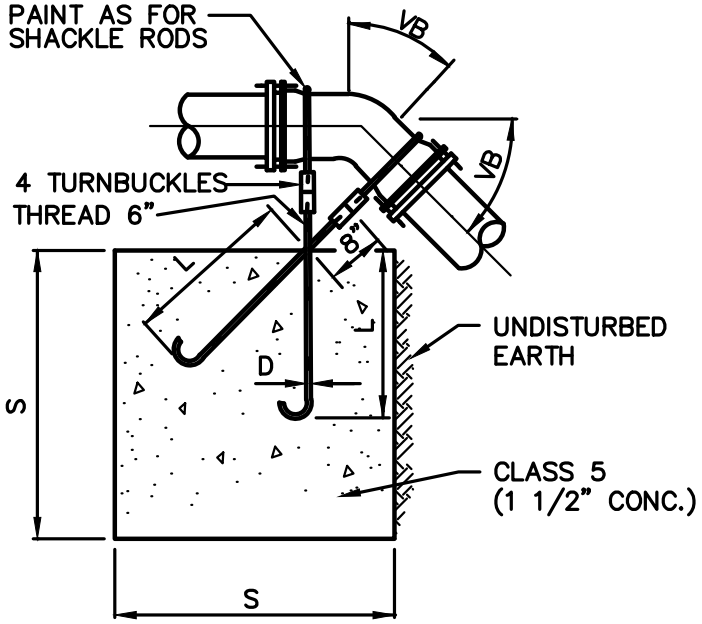
TYPE "B" BLOCKING
FOR – 45° VERTICAL BENDS

		VB		S	D	L
4"	300	45	30	3.1	5/8"	2.0
6"			68	4.1		
8"			123	5.0		
12"	250		232	6.1	3/4"	2.5
16"	225		478	7.8	1 1/8"	4.0
20"	200		560	8.2	1 1/4"	
24"			820	9.4	1 3/8"	4.5

THIS TABLE REPRESENTS THE "MINIMUM' CONSTRUCTION STANDARD. THE DEVELOPER'S ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING THE APPROPRIATE SIZE OF ALL ANCHOR BLOCKS BASED ON EXISTING AND LOCAL CONDITIONS.



TYPE "A" BLOCKING



TYPE "B" BLOCKING

NORTH BEACH WATER DISTRICT
WATER STANDARD DETAILS

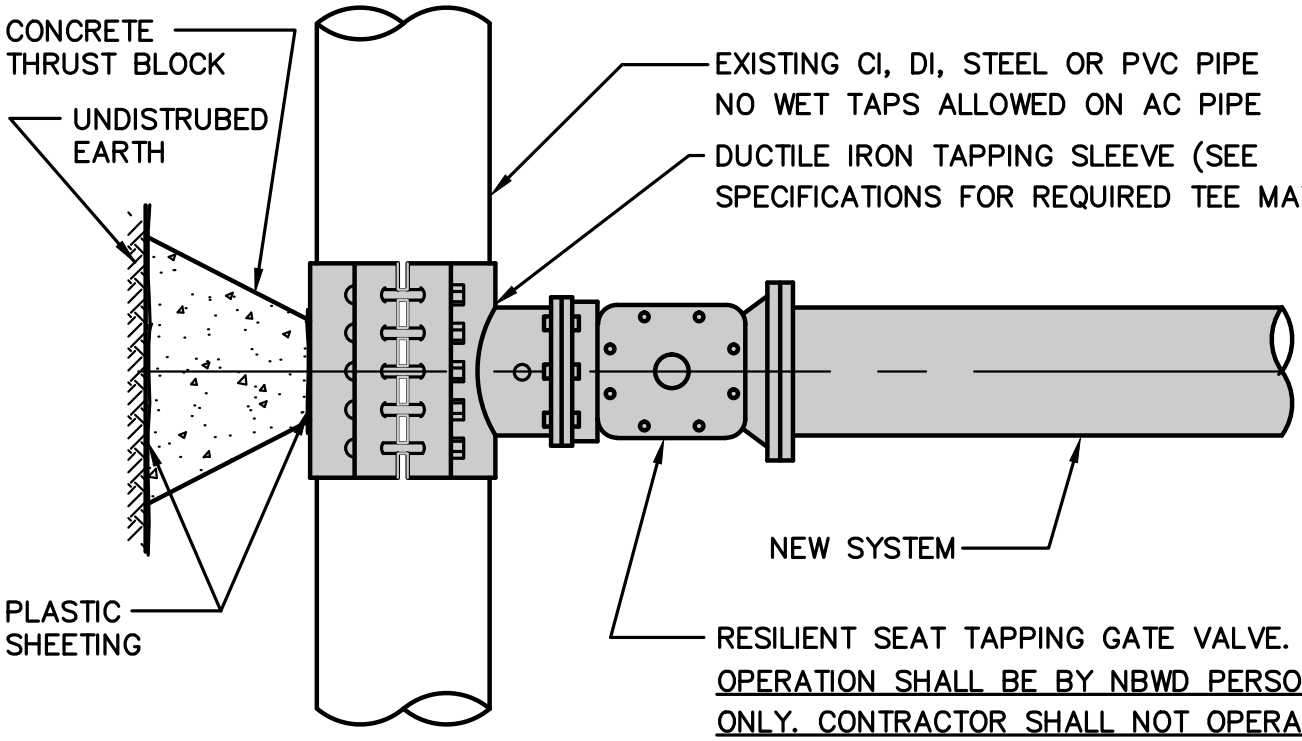
VERTICAL ANCHOR BLOCK

APPROVED:

GENERAL MANAGER _____ DATE _____

DWG. NO. 5

DATE:	DRWN:	CHKD:	SCALE:
10/14	C.D.G.	K.W.J.	NONE



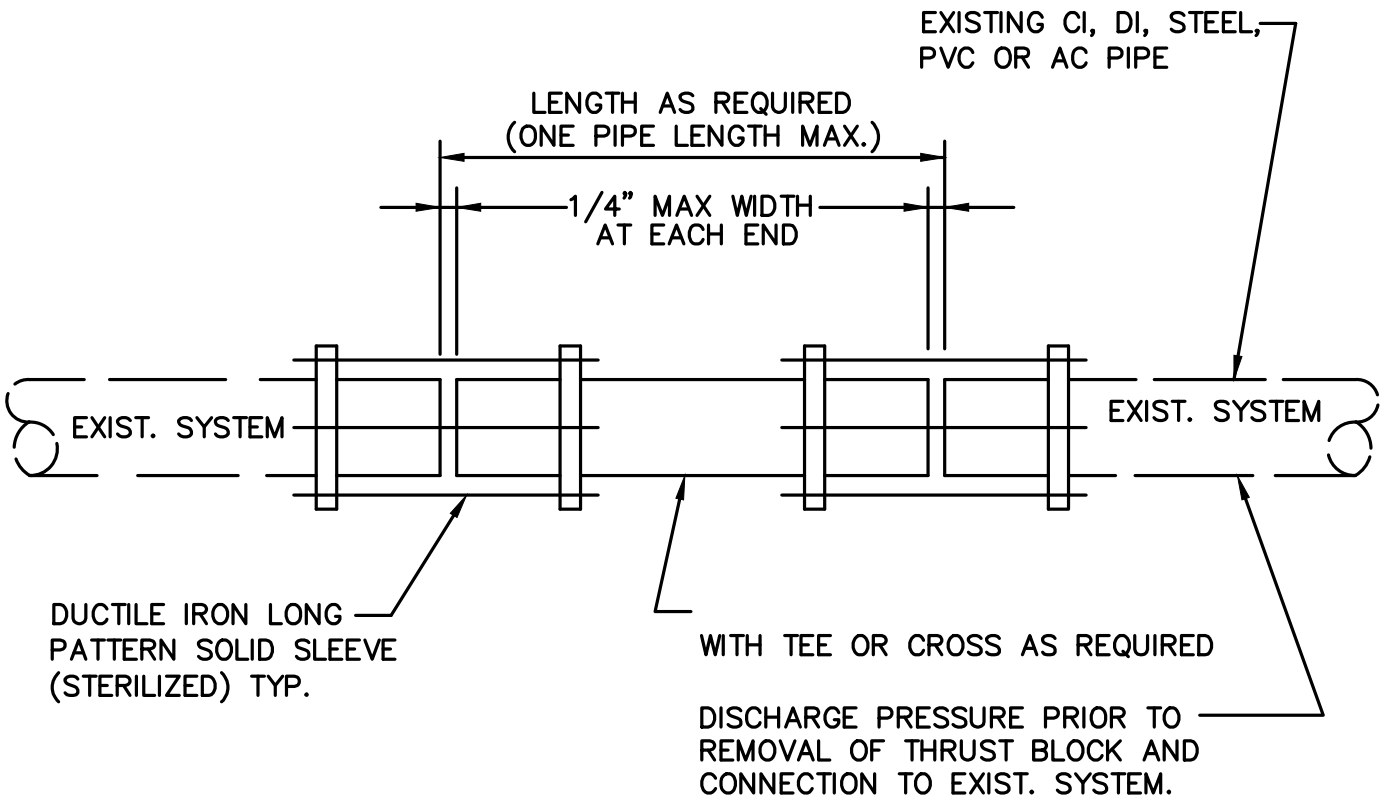
NOTE:

1. VALVE BOX TO HAVE A LOCKING LID UNTIL ACCEPTED BY NBWD

2. O.D. STEEL PIPE SHALL USE S.S. SLEEVE (FUSION COATED)

3. STAINLESS STEEL SLEEVE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY

NORTH BEACH WATER DISTRICT WATER STANDARD DETAILS			
WET TAP CONNECTION			
APPROVED: GENERAL MANAGER _____ DATE _____			DWG. NO. 6
DATE: 10/14	DRWN: C.D.G.	CHKD: K.W.J.	SCALE: NONE



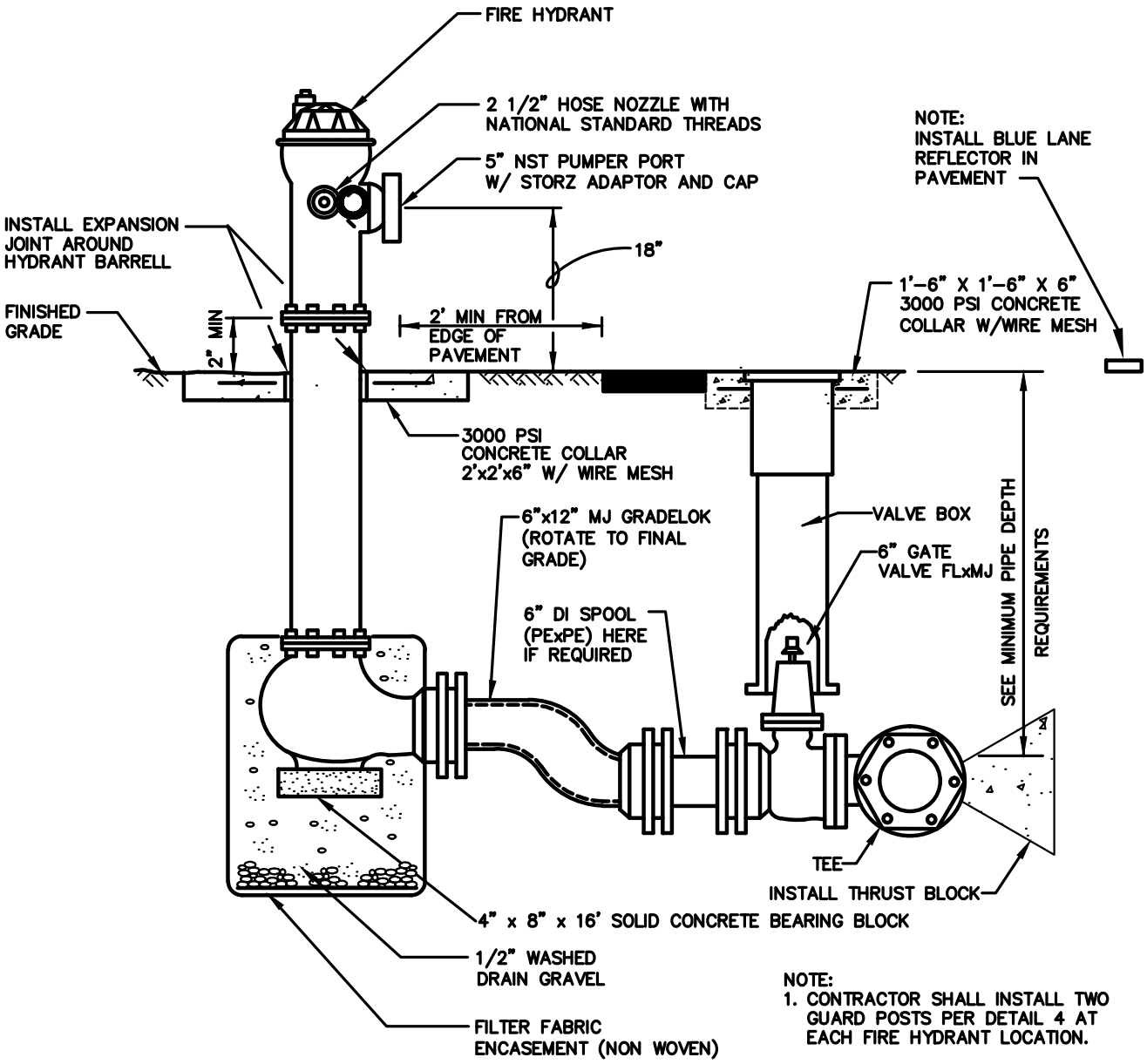
NOTE:

① NO DEFLECTION SHALL BE ALLOWED AT EITHER COUPLING.

② CUT–IN CONNECTIONS ON STEEL PIPE TO USE D.I. x O.D. STEEL TRANSITION COUPLINGS ROMAC OR EQUAL.

③ IN–LINE VALVE(S) IN EXISTING SYSTEM MAY BE REQUIRED AT THE SOLE DISCRETION OF SURFSIDE AT ALL NEW INTERTIE LOCATIONS. (NOTE: VALVE(S) ARE NOT SHOWN ABOVE FOR CLARITY)

NORTH BEACH WATER DISTRICT WATER STANDARD DETAILS			
CUT IN CONNECTION			
APPROVED: GENERAL MANAGER _____ DATE _____			DWG. NO. 7
DATE: 10/14	DRWN: C.D.G.	CHKD: K.W.J.	SCALE: NONE



* PAINT FIRE HYDRANT RUSTOLEUM SAFETY YELLOW BASE No. 288-14, COLOR CODE AX-6732, T-4432

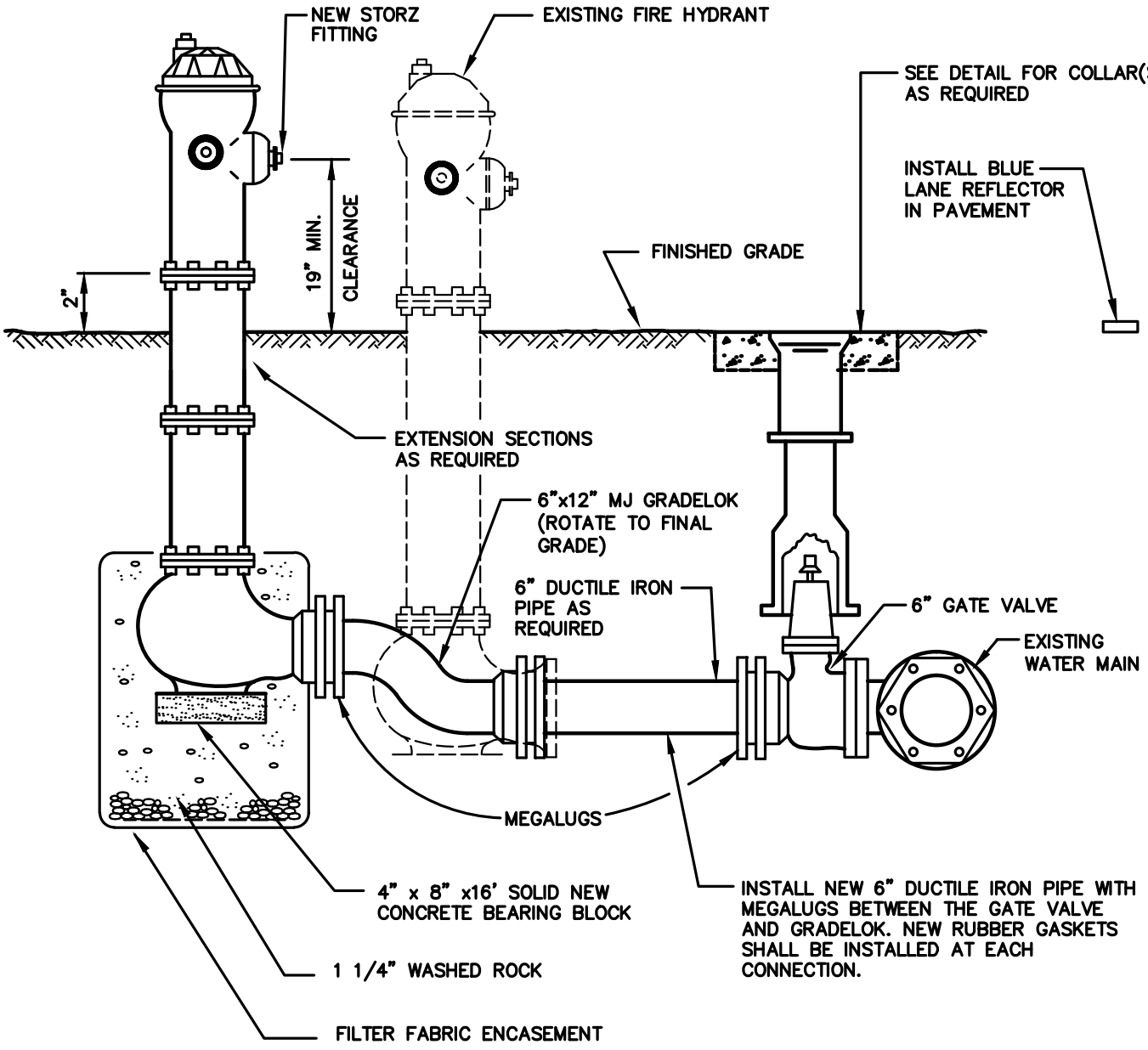
NOTE:
1. CONTRACTOR SHALL INSTALL TWO GUARD POSTS PER DETAIL 4 AT EACH FIRE HYDRANT LOCATION.
2. HYDRANT SHALL BE AS SPECIFIED IN THE ENGINEERING SPECIFICATIONS.
3. ALL MECHANICAL JOINTS SHALL BE PROVIDED W/ JOINT RESTRAINT GLANDS (MEGA-LUG, OR EQUAL)

NORTH BEACH WATER DISTRICT
WATER STANDARD DETAILS

FIRE HYDRANT INSTALLATION

APPROVED:		DWG. NO.
GENERAL MANAGER	DATE	8

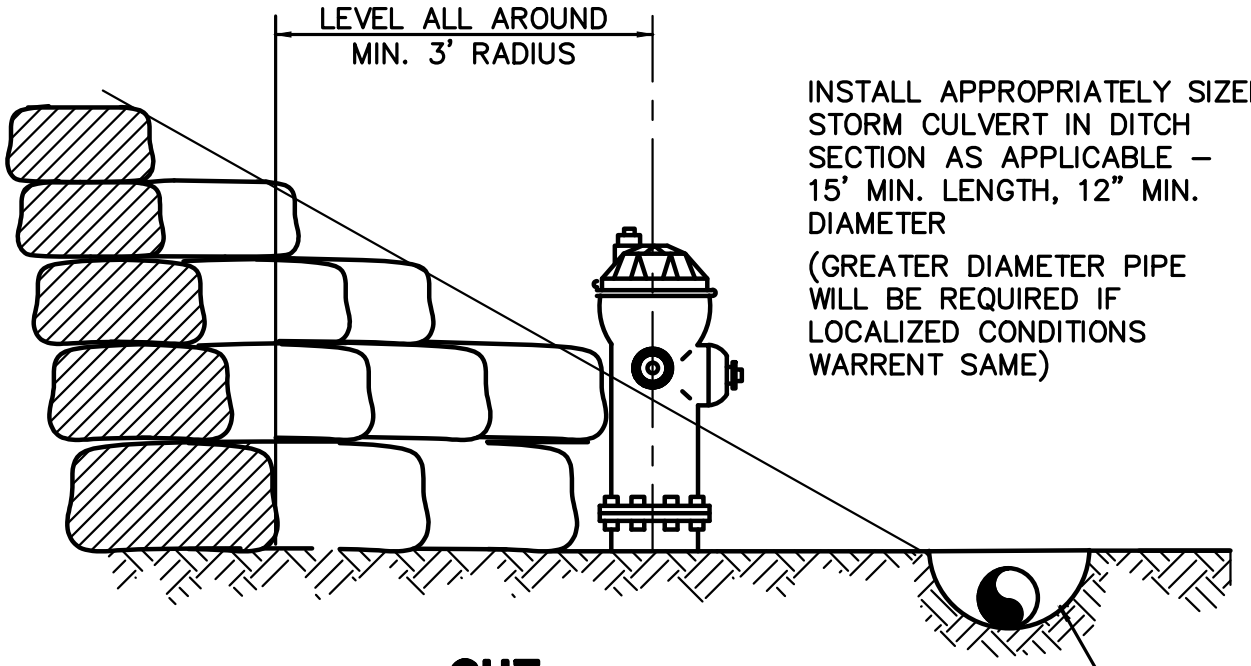
DATE:	DRWN:	CHKD:	SCALE:
10/14	C.D.G.	K.W.J.	NONE



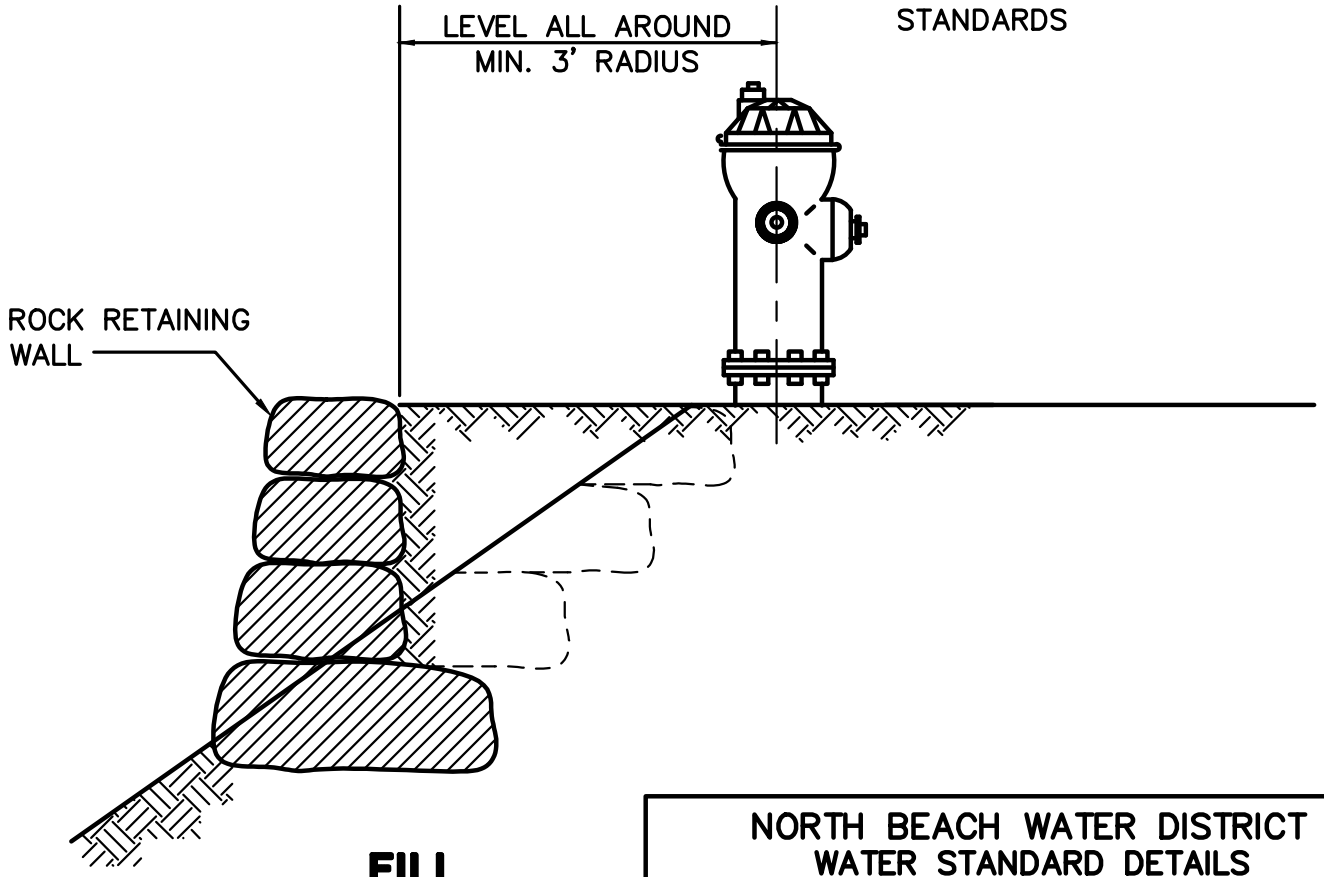
NOTES :

1. ALL RELOCATED FIRE HYDRANTS SHALL HAVE 4 1/2" PUMPER PORTS WITH STORZ ADAPTOR (DEVELOPER PROVIDE)
2. PROVIDE 15' OF 12" (MIN.) STORM PIPE IN ANY ADJACENT DITCH SECTION. RIP-RAP ENDS AND FILL ABANDONED DITCH SECTION
3. PROVIDE MIN. 3' – 0" CLEARANCE AND LEVEL AREA AROUND RELOCATED HYDRANT
4. REPAINT FIRE HYDRANT PER PACIFIC COUNTY FIRE PROTECTION DISTRICT No. 1 REQUIREMENTS

NORTH BEACH WATER DISTRICT WATER STANDARD DETAILS			
FIRE HYDRANT RELOCATION			
APPROVED: GENERAL MANAGER _____ DATE _____			DWG. NO. 9
DATE: 10/14	DRWN: C.D.G.	CHKD: K.W.J.	SCALE: NONE

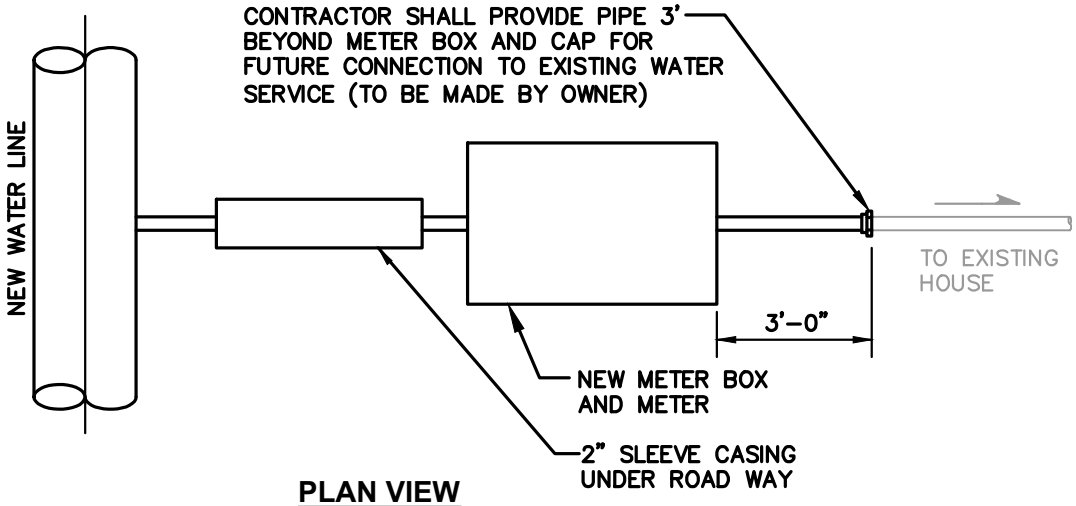


CUT

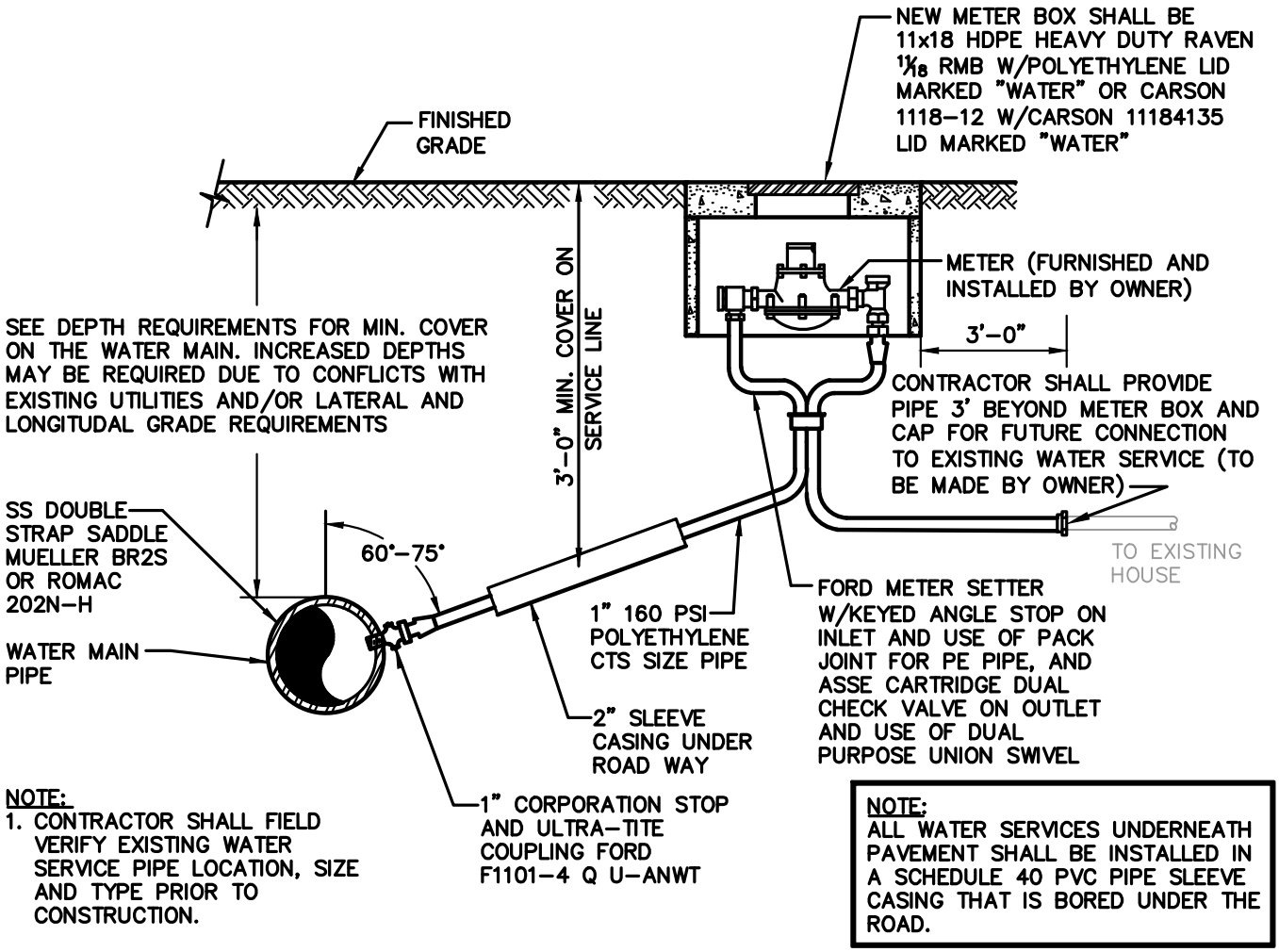


FILL

NORTH BEACH WATER DISTRICT WATER STANDARD DETAILS			
FIRE HYDRANT LOCATION IN CUT OR FILL			
APPROVED: GENERAL MANAGER _____ DATE _____			DWG. NO. 10
DATE: 10/14	DRWN: C.D.G.	CHKD: K.W.J.	SCALE: NONE



PLAN VIEW



NOTE:
1. CONTRACTOR SHALL FIELD VERIFY EXISTING WATER SERVICE PIPE LOCATION, SIZE AND TYPE PRIOR TO CONSTRUCTION.

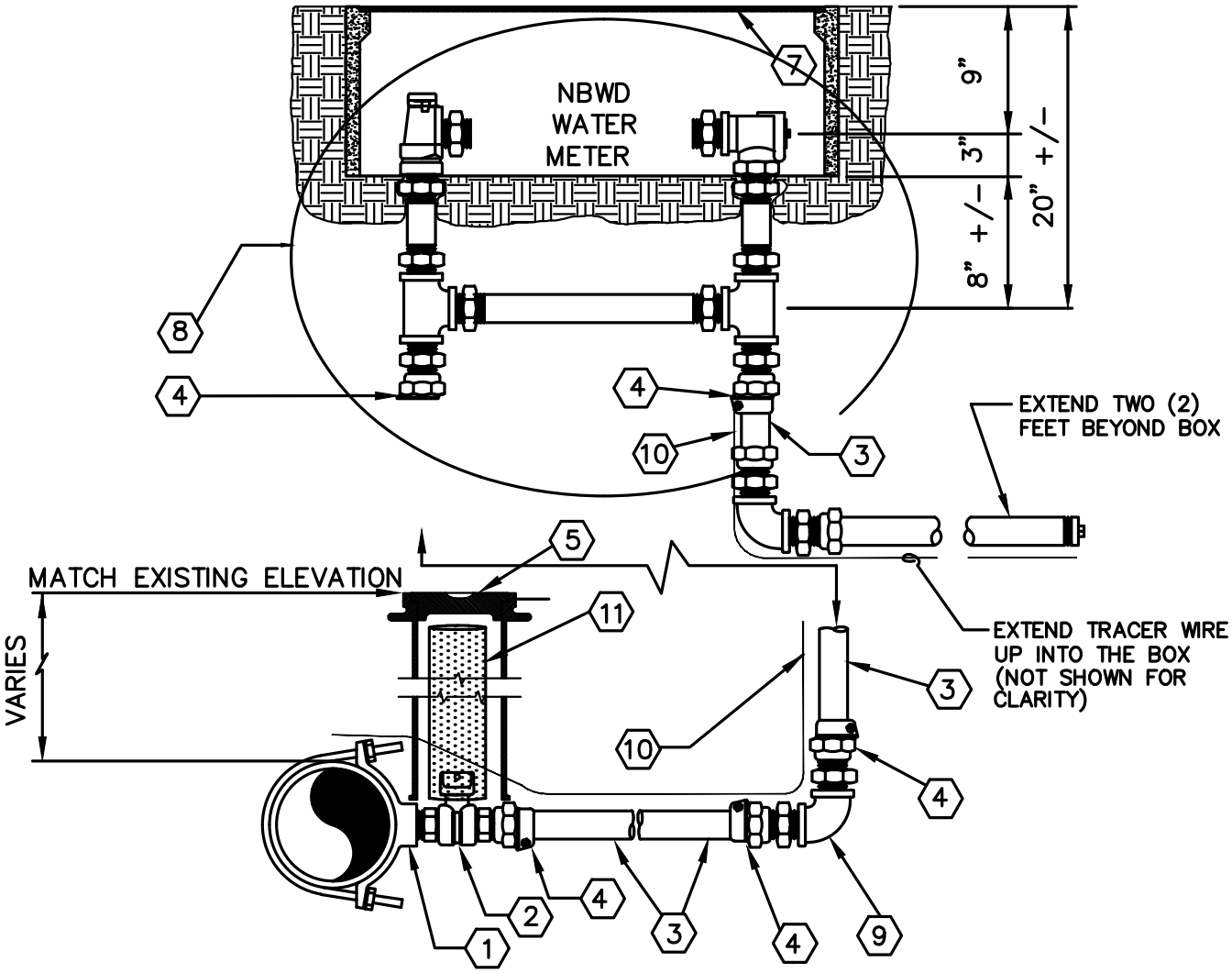
NOTE:
ALL WATER SERVICES UNDERNEATH PAVEMENT SHALL BE INSTALLED IN A SCHEDULE 40 PVC PIPE SLEEVE CASING THAT IS BORED UNDER THE ROAD.

NORTH BEACH WATER DISTRICT
WATER STANDARD DETAILS

1" AND SMALLER WATER SERVICE

APPROVED:		DWG. NO.
GENERAL MANAGER	DATE	11

DATE:	DRWN:	CHKD:	SCALE:
10/14	C.D.G.	K.W.J.	NONE



DESCRIPTION	MAKER OR RATING	1-1/2"	2"
1. DOUBLE STRAP SADDLE W/ S.S. STRAP	ROMAC OR EQUAL	202 IPT	202 IPT
2. BALL VALVE W/ 2" OPERATING NUT	FORD OR EQUAL	BALL VALVE	RESILIENT SEAT
3. PIPE - HIGH MOLECULAR POLYETHYLENE PIPE (I.P.S.)	SDR7(200PSI)	B11-666 W/QT67	GATE
4. COUPLING MALE	FORD OR EQUAL	C84-66	C84-77
5. VALVE BOX	RICH OR EQUAL		
6. NIPPLE BRASS		1-1/2" X 6"	2" X 6"
7. METER BOX	* SEE NOTE 2		
8. METER SETTER	FORD OR EQUAL	VFH 66-12 B	VFH 77-12 B
9. BRASS 90° ELBOW		1-1/2"	2"
10. TRACER WIRE	14 GAUGE COPPER WIRE	SOLID	SOLID
11. PVC SLEEVE BENEATH PAVEMENT	PVC-SCH.80	4" DIA.	4" DIA.
	SENSUS TOUCH READ		

NOTE:

1. TEMPORARILY INSTALL "SPACER" IN METER SETTER UNTIL METER IS INSTALLED
2. CARSON INDUSTRIES MODEL 1730 WITH CAST IRON READER IN NON-TRAFFIC AREAS; FOGTITE MODEL NO. 2 WITH HINGED METER READ LID, OR CARSON INDUSTRIES MODEL BC 1730 WITH CAST IRON READER LID IN TRAFFIC AREAS

NORTH BEACH WATER DISTRICT
WATER STANDARD DETAILS

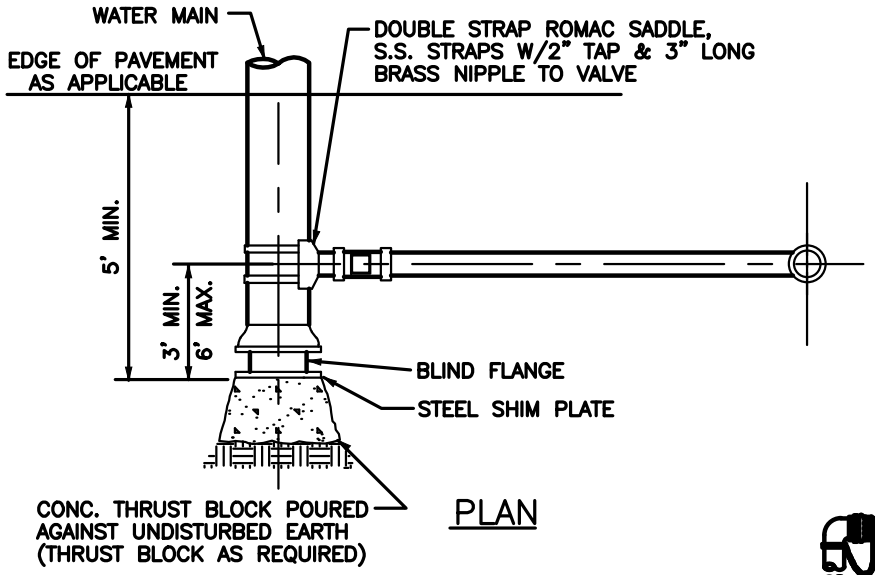
1-1/2" & 2" WATER SERVICE

APPROVED:

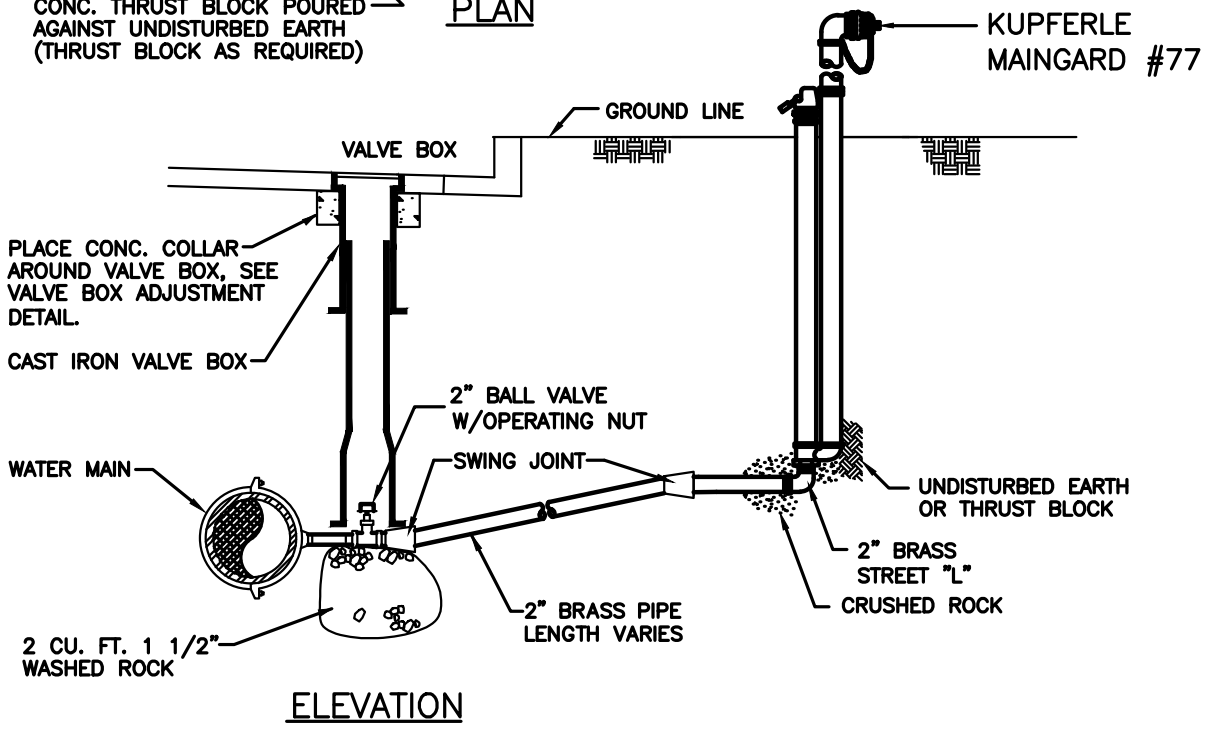
GENERAL MANAGER _____ DATE _____

DWG. NO. 12

DATE:	DRWN:	CHKD:	SCALE:
10/14	C.D.G.	K.W.J.	NONE



PLAN



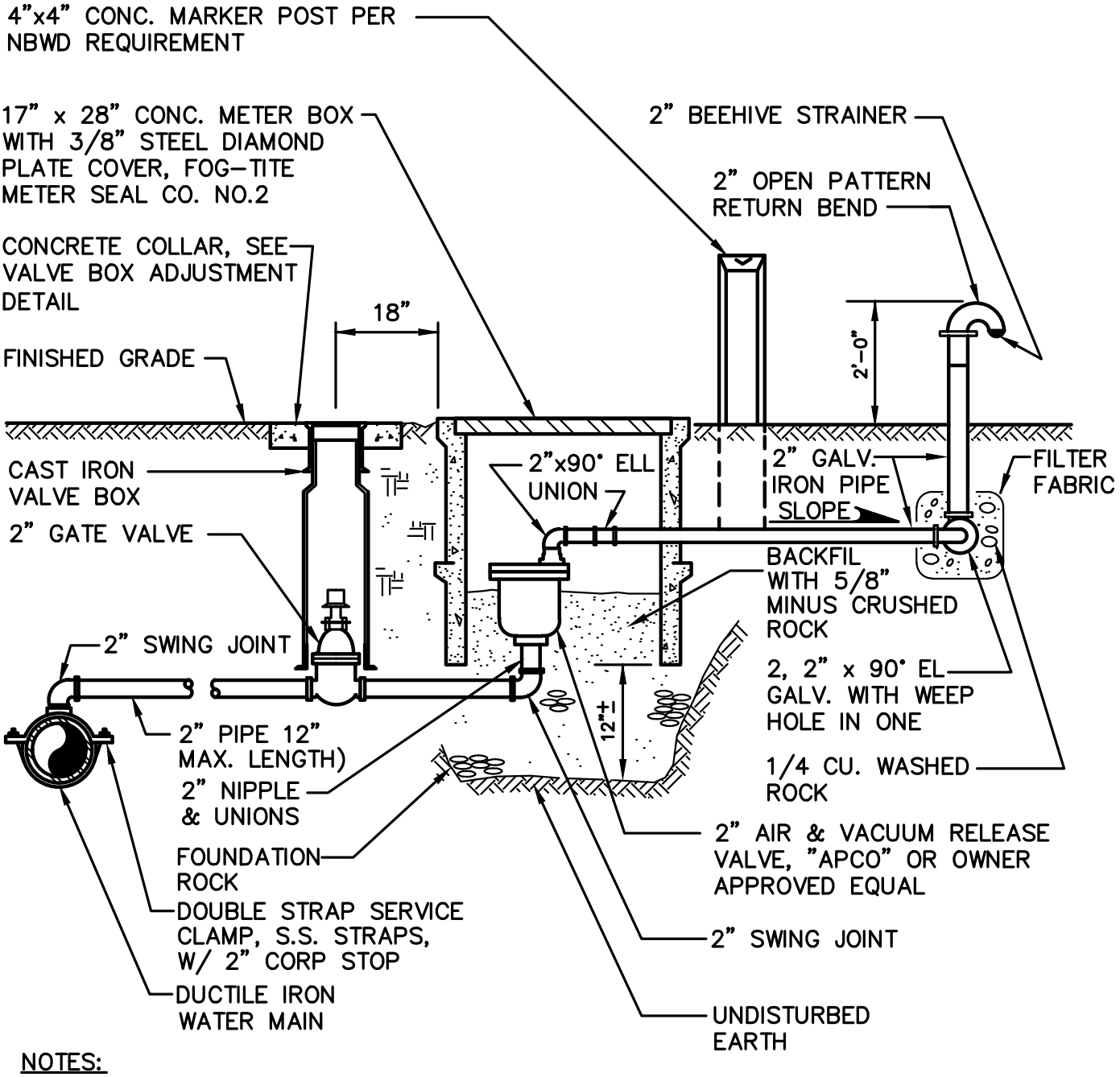
ELEVATION

BLOW-OFF HYDRANTS SHALL BE NON-FREEZING, SELF-DRAINING TYPE.

1. SET UNDERGROUND IN NBWD APPROVED METER BOX, THESE HYDRANTS SHALL BE FURNISHED WITH A 2" FIP INLET, A NON-TURNING OPERATING ROD, AND SHALL OPEN TO THE DESIGN, AND BE SERVICEABLE FROM ABOVE GRADE WITH NO DIGGING.
2. THE OUTLET SHALL BE BRONZE AND BE 2-1/2" NST.
3. HYDRANTS SHALL BE LOCKABLE TO PREVENT UNAUTHORIZED USE.

(SPECIFY OVERALL LENGTH 6" SHORTER THAN NORMAL DEPTH OF BURY. MINIMUM OPENING IN METER BOX SHALL BE 10".)

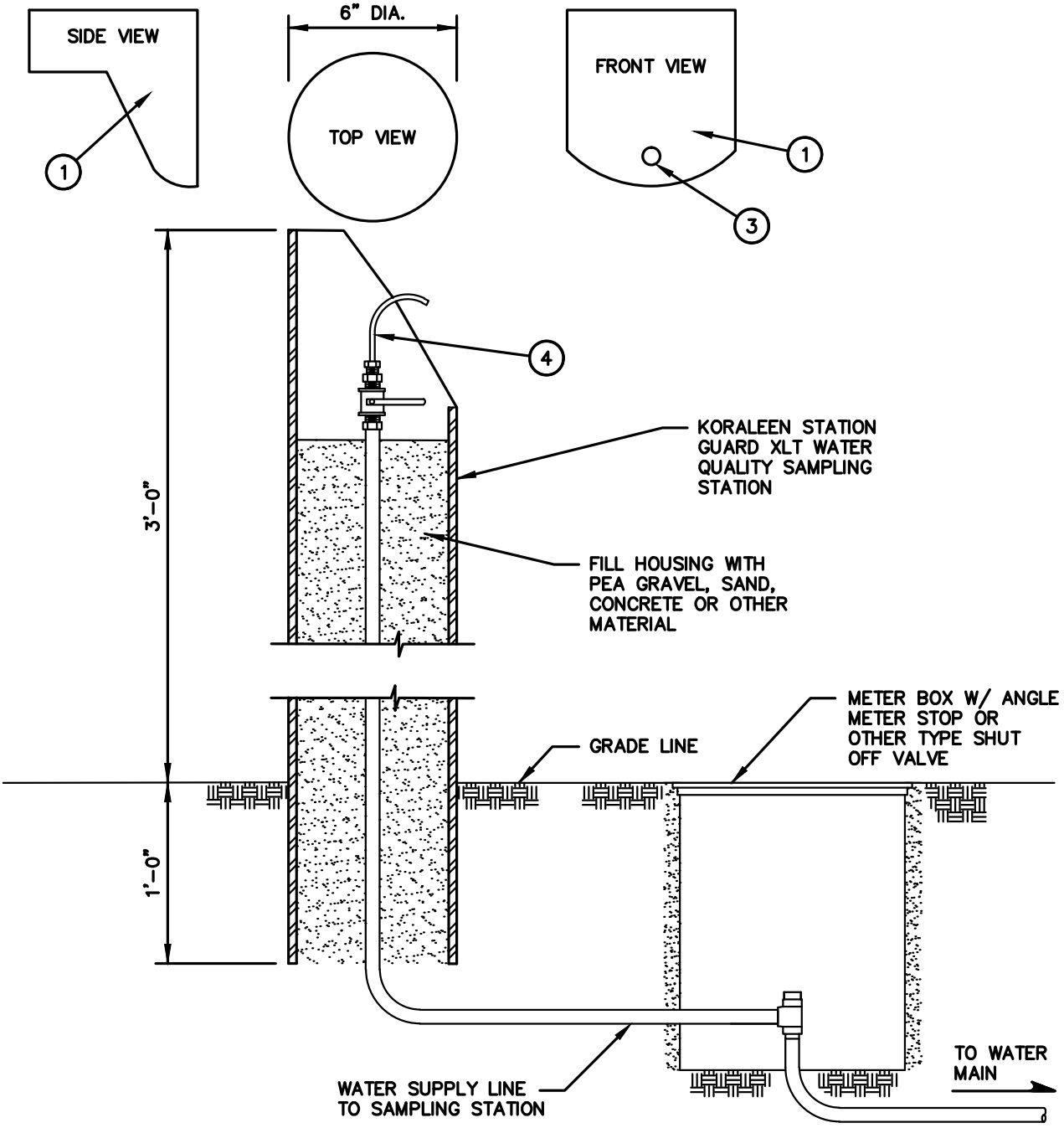
NORTH BEACH WATER DISTRICT WATER STANDARD DETAILS			
2" BLOW-OFF ASSEMBLY			
APPROVED: GENERAL MANAGER _____ DATE _____			DWG. NO. 13
DATE: 10/14	DRWN: C.D.G.	CHKD: K.W.J.	SCALE: NONE



NOTES:

1. GATE VALVE: AWWA RESILIENT SEAL, THRD x THRD WITH OPERATING NUT
2. ALL PIPING BETWEEN DOUBLE STRAP SADDLE AND INLET SIDE OF COMBINATION AIR & VAC ASSEMBLY SHALL BE BRASS
3. TAP MAIN AT SYSTEM HIGH POINT. LOCATION TO BE APPROVED BY THE SURFSIDE

NORTH BEACH WATER DISTRICT WATER STANDARD DETAILS			
AIR & VACUUM RELEASE ASSEMBLY			
APPROVED: GENERAL MANAGER _____ DATE _____			DWG. NO. 14
DATE: 10/14	DRWN: C.D.G.	CHKD: K.W.J.	SCALE: NONE



WATER QUALITY SAMPLING STATION	
1	ALUMINUM LID
2	ALUMINUM HOUSING – 6" DIA. (O.D.)
3	FLUSH MOUNTED LOCK
4	1/2"x3/8" BALL VALVE

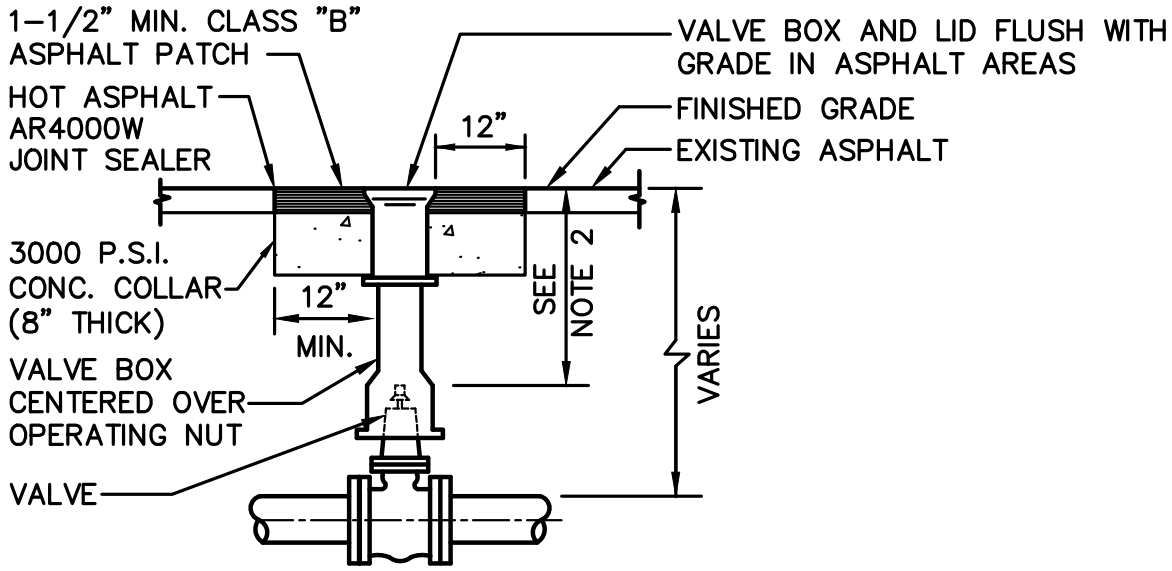
NORTH BEACH WATER DISTRICT
WATER STANDARD DETAILS
WATER SAMPLING STATION

APPROVED:

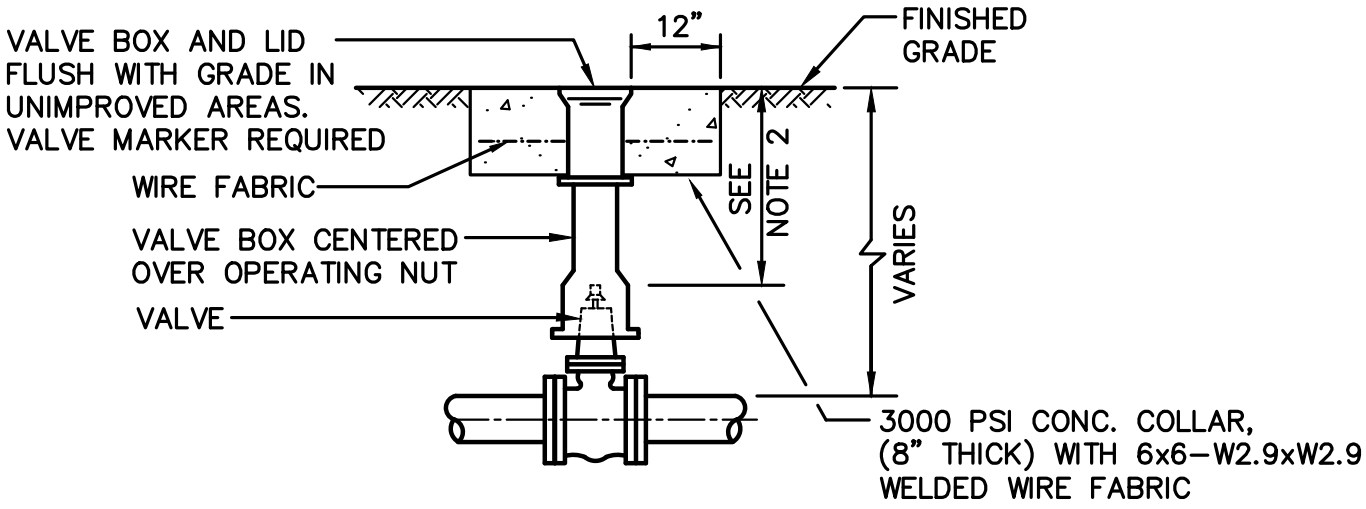
GENERAL MANAGER _____ DATE _____

DWG. NO. 15

DATE:	DRWN:	CHKD:	SCALE:
10/14	C.D.G.	K.W.J.	NONE



VALVE BOX IN ASPHALT AREA



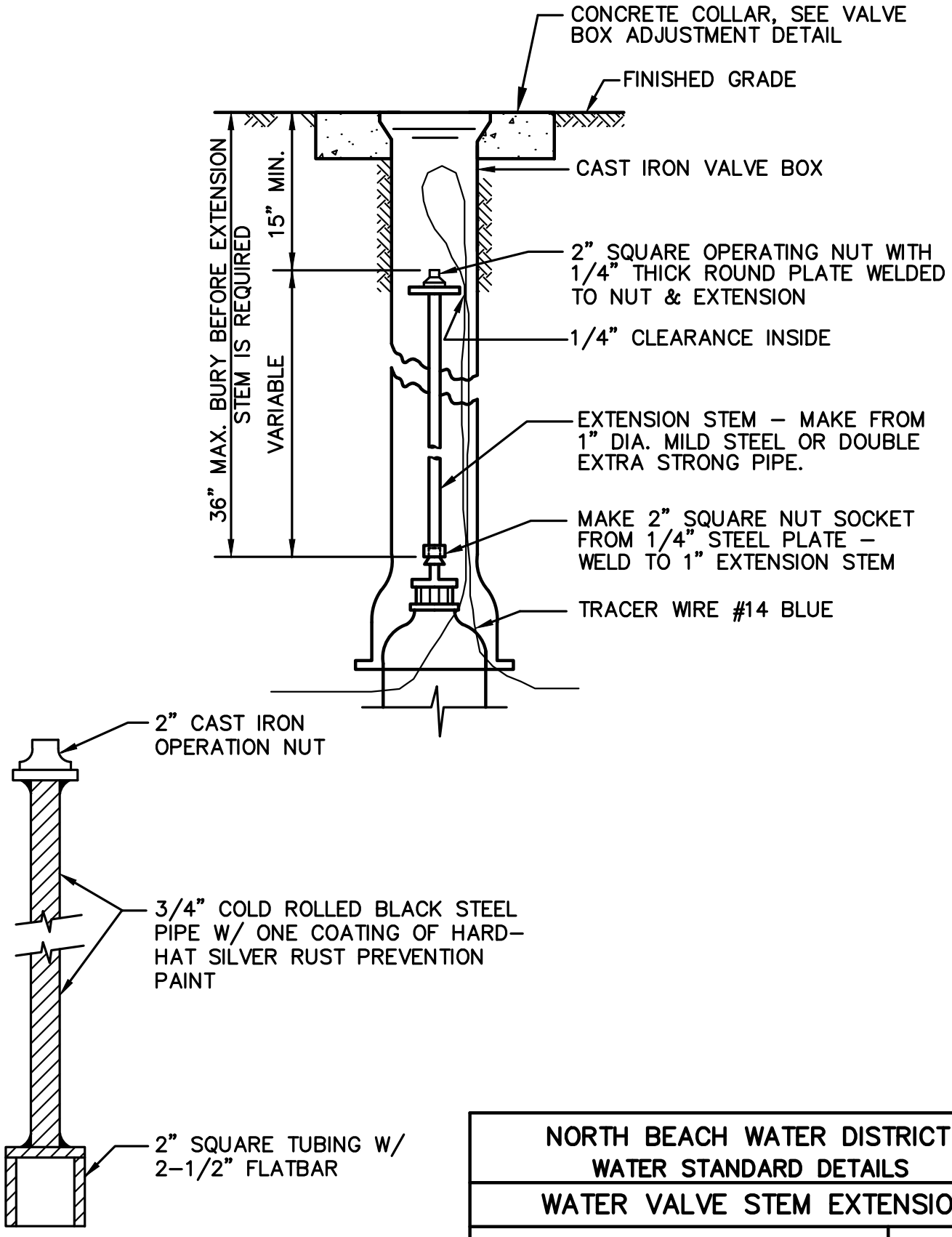
VALVE BOX IN UNIMPROVED AREA

NOTES:

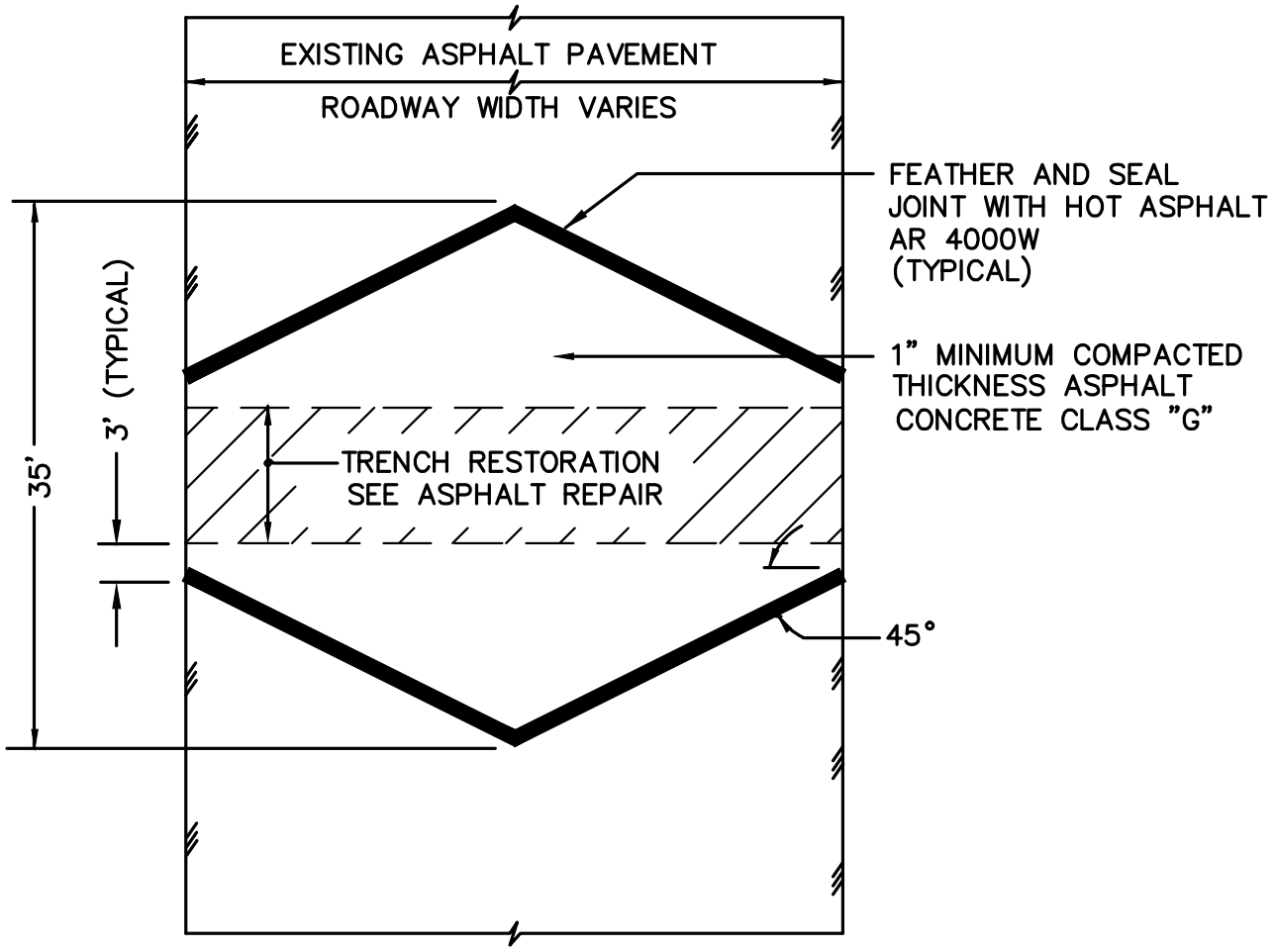
1. EACH VALVE SHALL BE PROVIDED WITH AND ADJUSTABLE CAST IRON VALVE BOX OF 5 INCHES (5") INSIDE DIAMETER. VALVE BOXES SHALL HAVE A TOP SECTION WITH AN EIGHTEEN INCH (18") MIN. LENGTH. THE VALVE BOX SHALL BE RICH No. 940 OR APPROVED EQUAL. VALVE BOX EARS SHALL BE PLACED IN LINE WITH PIPE IT SERVES.

2. 15" MINIMUM, 36" MAXIMUM FOR OPERATOR NUT. EXTENSION MAY BE REQUIRED.

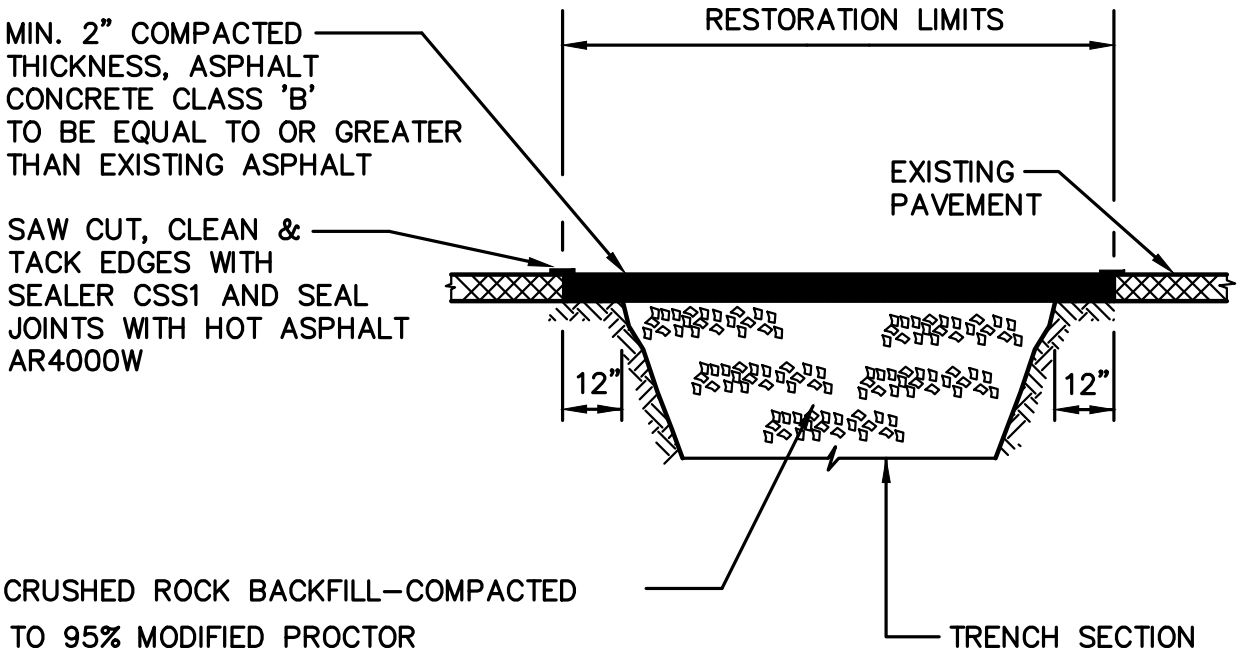
NORTH BEACH WATER DISTRICT WATER STANDARD DETAILS			
VALVE BOX ADJUSTMENT			
APPROVED: GENERAL MANAGER _____ DATE _____			DWG. NO. 16
DATE: 10/14	DRWN: C.D.G.	CHKD: K.W.J.	SCALE: NONE



NORTH BEACH WATER DISTRICT WATER STANDARD DETAILS			
WATER VALVE STEM EXTENSION			
APPROVED: GENERAL MANAGER _____ DATE _____			DWG. NO. 17
DATE: 10/14	DRWN: C.D.G.	CHKD: K.W.J.	SCALE: NONE



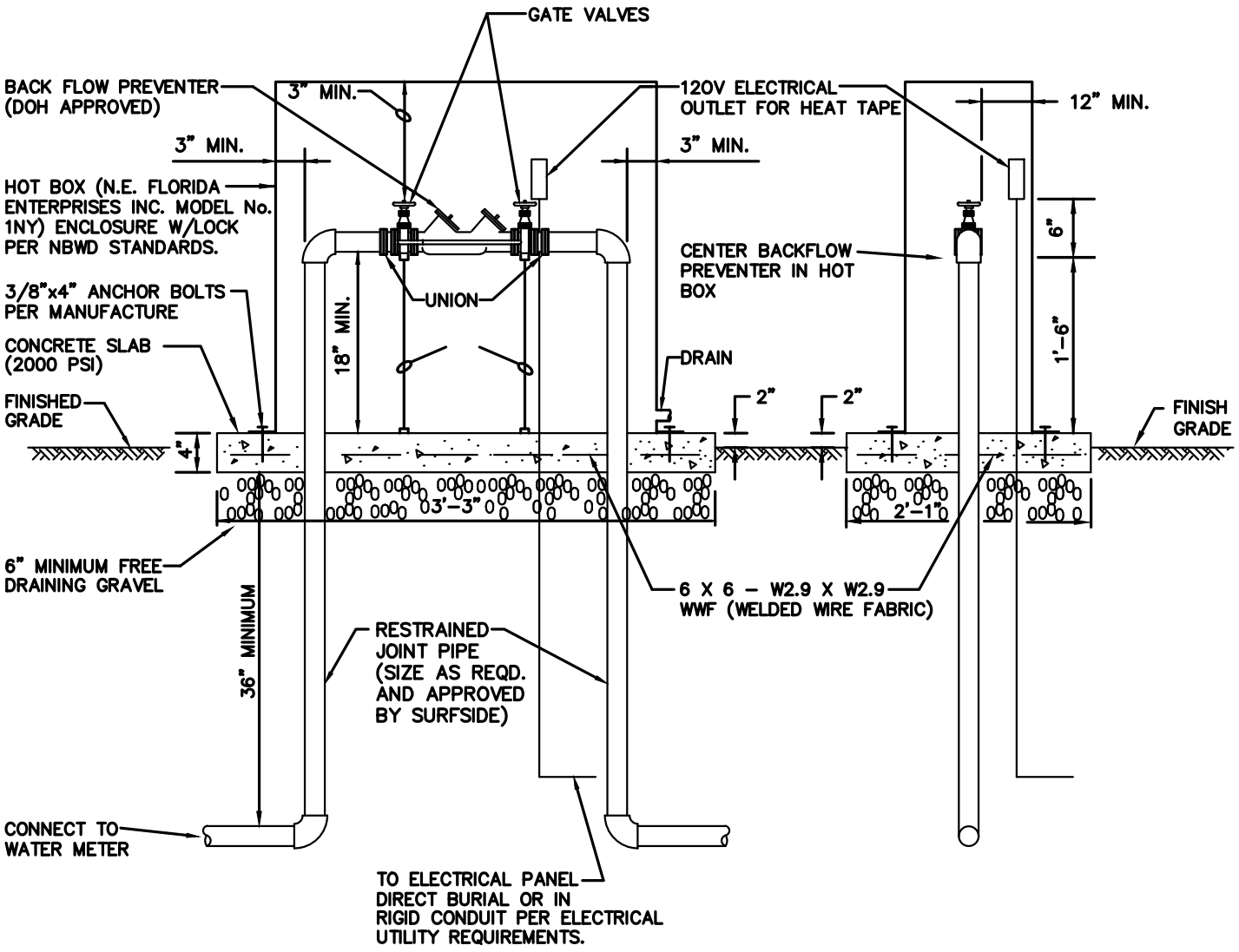
NORTH BEACH WATER DISTRICT WATER STANDARD DETAILS			
ASPHALT DIAMOND PATCH			
APPROVED: GENERAL MANAGER _____ DATE _____			DWG. NO. 18
DATE: 10/14	DRWN: C.D.G.	CHKD: K.W.J.	SCALE: NONE



NOTES:

1. PACIFIC COUNTY PUBLIC WORKS R.O.W CONSTRUCTION PERMITS MAY REQUIRE ALTERNATE RESTORATION
2. 100% CRUSHED ROCK BACKFILL REQUIRED ON ALL ROADWAY CUTS

NORTH BEACH WATER DISTRICT WATER STANDARD DETAILS			
ASPHALT PAVEMENT REPAIR			
APPROVED: GENERAL MANAGER _____ DATE _____			DWG. NO. 19
DATE: 10/14	DRWN: C.D.G.	CHKD: K.W.J.	SCALE: NONE



REDUCED PRESSURE BACKFLOW DEVICE

NOT TO SCALE

(1) PROVIDE SURFSIDE APPROVED SUPPORT FOR 2 1/2" AND LARGER DEVICES.

NORTH BEACH WATER DISTRICT WATER STANDARD DETAILS			
REDUCED PRESSURE BACKFLOW DEVICE			
APPROVED: GENERAL MANAGER _____ DATE _____			DWG. NO. 20
DATE: 10/14	DRWN: C.D.G.	CHKD: K.W.J.	SCALE: NONE

21. WATER MAIN INSTALLATION NOTES:

1. At least five (5) days prior to any construction activity, the developer/contractor shall schedule and attend a pre-construction conference with NBWD.

2. An approved copy of these plans must be on the job site whenever construction is in progress.

3. All work and material shall be in accordance with the DOH approved standards and specifications of NBWD.

4. All water system improvements shall be constructed in accordance with these approved plans. Any deviation from the plans will require approval from the owner, engineer, NBWD and appropriate public agencies.

5. Notify NBWD 72 hours (3 working days) prior to beginning construction and for any restarts of work.

6. The Contractor shall notify NBWD three working days prior to the time the contractor would like to connect to existing mains or for installation of tapping tees. The connection shall be done in accordance with district requirements. Contractor shall not operate any district valves; these will be operated by the NBWD personnel.

7. For aid in utility location, call 1-800-424-5555, 48 hours (2 working days) prior to beginning of construction. Existing utilities, whether shown or not, shall be located prior to construction, so as to avoid damage or disturbance, and the contractor shall assume all responsibility and costs connected therewith to protect, maintain and repair, where necessary.

8. Water line construction shall not commence until the street has been brought to sub grade, meeting NBWD's approval.

9. Water main shall be field staked prior to construction, with 25 foot stakes on curves. Lot corner stakes shall also be in place prior to construction.

10. Pipe shall be ductile iron, AWWA class 52 thickness, joints shall have rubber gasket, push-on type, or mechanical joint, meeting AWWA specifications, or PVC, AWWA C-900 class 150 with push-on joints and ductile iron fittings. Fittings shall be AWWA, cement lined, ductile iron, either mechanical joint or flanged, as indicated herein.

11. Unless otherwise specified valves 12" and smaller shall be ductile iron resilient seated (epoxy coated) gate valves: acceptable valves are Waterous, Clow and M&H; valves larger than 12" shall be butterfly valves, acceptable valves are Pratt and M&H.

12. All water works fittings and bolted assemblies shall be completely covered with visqueen plastic, 4 mil. The end of the plastic shall be taped to secure them to the pipe.

13. Hydrants shall be as specified in the Engineering Specifications. Hydrants shall be furnished with threaded outlets and Storz Adaptors, meeting Fire District / NBWD standards. Both thrust blocking and mega lugs restraints are required on each hydrant installation.

14. Provide thrust blocking at all fittings and bends and up-thrust fittings, in accordance with NBWD's standards, conditions and specifications.

15. All new connections to the existing system shall be in strict conformance with the appropriate subsections of the specifications of NBWD. No connection shall be made between the new main and the existing mains until the new piping has been flushed, disinfected and tested.

16. Where road grades are established, provide a minimum of 42" cover over 12" or larger water mains, provide a minimum of 36" cover over 8" mains; or additional depth, as directed by inspector, or as required to miss other utilities.

17. Water mains constructed within easement or private roads shall be installed with a 4'-0" minimum cover.

18. Minimum radius for 12" and smaller pipe lines constructed on curves (4 degree deflection per joint) is 258 feet. Contractor to provide additional fittings as required for pipe alignment with a radius of less than 258 feet.

19. Compaction-all trench backfill and roadway embankment shall be compacted to 95% of modified proctor maximum density, in accordance with ASTM d-698, except the top 6" in paved areas which shall be 100%.

20. Construction inspection will be done by NBWD and/or their designated engineer.

21. The water main construction phase will not be considered complete until the installation is acceptable to NBWD including satisfactory hydrostatic pressure test, a satisfactory disinfection test, satisfactory flow of service lines, and completion of all items on the inspector's punch list.

22. Water service is available only after transfer of ownership to NBWD and after payment of all current applicable fees.

SECTION 4

STANDARDS FOR "AS-BUILT" DRAWINGS

SECTION FOUR

NBWD Standards for As-Built Drawings

The following are requirements for all as-built drawings submitted for approval and/or acceptance to the NBWD.

1. Each and every sheet shall have a statement signed by a Registered Professional Engineer licensed by the State of Washington attesting to the completeness and accuracy of the as-built drawings. Easements for water facilities not located in the public rights-of-way shall be recorded and the recording number shall be shown on the as-built drawings.

2. The water system drawings shall show all valves, tees, fittings and hydrants. All dimensions shall be listed on the drawings.

3. Where services are tapped off of new or existing water mains, location of taps shall be shown on a separate table on the as-built drawings. Location of the meter box and setter, depth of service line, size of service line and address or addresses served shall also be shown on this table.

4. As-built drawings shall show distances to the water main from each near side property corner and/or right-of-way line at 100 foot intervals.

5. All hydrants shall show depth of bury and a completed hydrant installation report shall be submitted.

6. All valves shall show depth of bury and a complete valve installation report shall be submitted.

7. Hand drawn as-builts shall be on 24" x 36" reproducible fixed lined Mylar (no adhesive backed additions will be allowed). Digitally drawn as-builts may be printed on 24" x 36" white paper provided that a digital copy of the as-built drawing must be provided to NBWD on a compact disk, in a widely used standard version of AutoCad v2007 or less.

8. All meters shall clearly show that they are in the public rights-of-way or easements and the recording number shown on the as-built drawing. Distances from the meter to the nearest property corner or fixed point shall be shown on the as-built drawings.

9. NBWD's Auto-CADD file, latest revision, shall be furnished and supplied to the NBWD if requested. The computer file shall be supplied on a compact disk.

APPENDIX F

WATER SYSTEM HYDRAULIC MODEL MAPS AND OUTPUTS

500' 250' 0 500' 1000'

SCALE: 1"=500'

NORTH WELL FIELD

SOUTH WELL FIELD

MORNEAD ROAD

COAST OYSTER

SANDRIDGE ROAD

BROADWAY

BAY AVE

LEGEND

- 2-INCH
- 3-INCH
- 4-INCH
- 6-INCH
- 8-INCH
- 12-INCH
- FIRE HYDRANT NODE
- JUNCTION NODE

NORTH BEACH WATER DISTRICT.

HYDRAULIC MODEL NODE MAP

Gray & Osborne, Inc.

CONSULTING ENGINEERS

Township 12
Range 11W
Township 11
Range 11W

Township 12
Range 11W
Township 11
Range 11W

Pacific Shores Unit No.2
Pacific Shores/Unit No.1
Pacific Pines State Parks
Railroad Addition
NORTH ADDITION
Meadhead Acres
Woodland Glen
Avalon Plat
Park Villa
Bay Ave
Ocean Park Unit
Ocean Meadows Unit - One
Ocean Meadows Unit - Two
Ridgewood Unit-1
Ridgewood Unit-2
Sunset Sands Div.No.1
Sunset Sands Div.No.2
Sunset Sands Div.No.3
Wyeenah's Short Plat
Klipsan Beach Cottages
Derrick's Beach Tract
Loomis Lake
Lost Lake
Sharlie Kissner
Tracy Moore
Edward I. Markx
James Leggett
Loomis State Park
Vista Bay Tracts
Tract-D
Hills Trailer Court
Les Swingen & Karen Sub
SW 1/4 NE 1/4

Legend
2"
3"
4"
6"
8"
12"

FLOW HYDRANT
PRESSURE HYDRANT

500' 250' 0 500' 1000'

SCALE: 1"=500'

NORTH WELL FIELD

SOUTH WELL FIELD

LEGEND

- 2–INCH
- 3–INCH
- 4–INCH
- 6–INCH
- 8–INCH
- 12–INCH
- JUNCTION NODE LESS THAN 30 PSI
- JUNCTION NODE 30 TO 40 PSI
- JUNCTION NODE 40 TO 50 PSI
- JUNCTION NODE GREATER THAN 50 PSI

NORTH BEACH WATER DISTRICT.

SYSTEM PRESSURE – 2015 PEAK HOUR

Gray & Osborne, Inc.
CONSULTING ENGINEERS

500' 250' 0 500' 1000'

SCALE: 1"=500'

NORTH WELL FIELD

SOUTH WELL FIELD

LEGEND

- 2-INCH
- 3-INCH
- 4-INCH
- 6-INCH
- 8-INCH
- 12-INCH
- JUNCTION NODE
- HYDRANT NODE LESS THAN 500 GPM
- HYDRANT NODE 500 TO 750 GPM
- HYDRANT NODE 750 TO 1,500 GPM
- HYDRANT NODE GREATER THAN 1,500 GPM

NORTH BEACH WATER DISTRICT.

2015 AVAILABLE FIRE FLOW

Gray & Osborne, Inc.
CONSULTING ENGINEERS

500' 250' 0 500' 1000'

SCALE: 1"=500'

NORTH WELL FIELD

SOUTH WELL FIELD

LEGEND

- 2–INCH
- 3–INCH
- 4–INCH
- 6–INCH
- 8–INCH
- 12–INCH
- JUNCTION NODE
- HYDRANT NODE LESS THAN 500 GPM
- HYDRANT NODE 500 TO 750 GPM
- HYDRANT NODE 750 TO 1,500 GPM
- HYDRANT NODE GREATER THAN 1,500 GPM

NORTH BEACH WATER DISTRICT.

2021 AVAILABLE FIRE FLOW

Gray & Osborne, Inc.
CONSULTING ENGINEERS

North Beach Water District
Water System Plan
Hydraulic Modeling Results
September 29, 2014

Scenario: 2015 Available Residential Fire Flow
Sorted from lowest to highest fire flow

ID	Static Demand (gpm)	Static Pressure (psi)	Fire-Flow Demand (gpm)	Design Flow (gpm)
J1480	0.62	52.24	750	209
J1482	0.62	53.11	750	209
J1670	0.62	52.19	750	283
J16	0.62	50.75	750	355
FH-1	0.62	52.49	750	356
FH-2	0.62	50.33	750	400
J144	0.62	52.1	750	425
J162	0.62	50.85	750	461
J242	0.62	53.6	750	488
J1158	0.62	53.47	750	489
J190	0.62	50.9	750	498
J192	0.62	54.36	750	498
J194	0.62	54.36	750	498
J1694	0.62	51.73	750	522
J692	0.62	54.74	750	538
J710	0.62	53.5	750	540
J1716	0	51.66	750	542
J688	0.62	55.61	750	550
J952	0.62	53.9	750	550
J268	0.62	51.48	750	564
J1672	0.62	53.03	750	583
J362	0.62	56.19	750	593
J1688	0.62	56.91	750	600
J1690	0.62	57.34	750	602
J1676	0.62	57.06	750	609
J1692	0.62	56.48	750	613
J328	0.62	53.22	750	628
J1674	0.62	51.88	750	678
J502	0.62	54.35	750	801
J326	0.62	56.25	750	829
J1658	0.62	56.05	750	829
J1706	0.62	60.43	750	1,082
J1678	0.62	55.63	750	1,195
J446	0.62	55.98	750	1,208
J518	0.62	57.39	750	1,222
J814	0.62	60.87	750	1,385
J1684	0.62	56.53	750	1,794
J794	0.62	60	750	1,918
J1704	0.62	59.57	750	2,006
J1702	0.62	54.4	750	2,044
J724	0.62	53.08	750	2,067
J1700	0.62	56.13	750	2,126
J1686	0.62	56.1	750	2,289
J1682	0.62	54.8	750	2,713
J426	0.62	56.68	750	2,828
J472	0.62	56.26	750	2,909
J1680	0.62	55.85	750	3,014
J450	0.62	57.61	750	3,093
J1708	0.62	57.83	750	3,253
J1698	0.62	56.39	750	3,450
J792	0.62	56.43	750	3,523

Reservoir	Level
North Wellfield	37.28
South Wellfield	32.63

Applicable Fire Storage Requirement

750 gpm for 60 minutes

Booster Pump	Capacity (gpm)	Status
NWF N-1	109	ON
NWF N-2	120	ON
NWF N-3	280	ON
NWF N-4	500	ON
NWF N-5	500	OFF
NWF N-6	120	ON
NWF N-7	120	ON
NWF N-8	120	ON
SWF S-1	175	ON
SWF S-2	175	ON
SWF S-3	750	ON
SWF S-4	750	ON

System Improvements

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J1282	1.05	39	119.5	34.9
J1346	1.05	36	116.8	35.0
J1342	1.05	36	117.0	35.1
J1518	1.05	31	113.5	35.7
J1280	1.05	37	119.5	35.8
J1246	1.05	39	121.5	35.8
J1432	1.05	31	114.3	36.1
J1244	1.05	38	121.5	36.2
J1400	1.05	32	115.6	36.2
J1396	1.05	32	115.7	36.3
J1370	1.05	32	115.9	36.3
J1376	1.05	32	115.9	36.4
J1360	1.05	32	116.2	36.5
J1304	1.05	34	118.3	36.5
J1470	1.05	30	114.5	36.6
J1632	1.05	29	113.5	36.6
J1526	1.05	29	113.5	36.6
J1514	1.05	29	113.5	36.6
J1278	1.05	35	119.5	36.6
J1242	1.05	37	121.5	36.6
J1500	1.05	29	113.6	36.7
J1414	1.05	30	114.7	36.7
J30	1.05	31	115.7	36.7
J1496	1.05	29	113.7	36.7
J1462	1.05	30	114.8	36.7
J1300	1.05	33	117.9	36.8
J1458	1.05	30	114.9	36.8
J1454	1.05	30	115.1	36.9
J1442	1.05	29	114.2	36.9
J1440	1.05	29	114.3	36.9
J1438	1.05	29	114.3	36.9
J1434	1.05	29	114.3	37.0
J1296	1.05	33	118.3	37.0
J1474	1.05	29	114.3	37.0
J1430	1.05	29	114.4	37.0
J1410	1.05	30	115.4	37.0
J1426	1.05	29	114.4	37.0
J1524	1.05	28	113.5	37.0
J1634	1.05	28	113.5	37.0
J1520	1.05	28	113.5	37.0
J1406	1.05	30	115.5	37.0
J1510	1.05	28	113.5	37.1
J1248	1.05	36	121.5	37.1
J1506	1.05	28	113.5	37.1
J1422	1.05	29	114.5	37.1
J1502	1.05	28	113.6	37.1
J1504	1.05	28	113.6	37.1
J1258	1.05	35	120.6	37.1
J1498	1.05	28	113.6	37.1
J38	1.05	30	115.7	37.1
J36	1.05	30	115.7	37.1
J32	1.05	30	115.7	37.1
J1254	1.05	35	120.7	37.1

Reservoir	Level
North Wellfield	40.0
South Wellfield	35.0

Applicable Fire Storage Requirement

Not Applicable

Booster Pump	Capacity (gpm)	Status
NWF N-1	109	ON
NWF N-2	120	ON
NWF N-3	280	ON
NWF N-4	500	OFF
NWF N-5	500	OFF
NWF N-6	120	ON
NWF N-7	120	ON
NWF N-8	120	ON
SWF S-1	175	ON
SWF S-2	175	ON
SWF S-3	750	OFF
SWF S-4	750	OFF

System Improvements

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J1292	1.05	33	118.7	37.1
J1636	1.05	28	113.8	37.2
J1492	1.05	28	113.8	37.2
J1050	1.05	40	125.8	37.2
J1384	1.05	30	115.9	37.2
J1116	1.05	37	122.9	37.2
J1490	1.05	28	114.0	37.2
J1638	1.05	28	114.0	37.3
J1488	1.05	28	114.0	37.3
J1486	1.05	28	114.0	37.3
J1266	1.05	34	120.0	37.3
J1626	1.05	30	116.0	37.3
J1366	1.05	30	116.0	37.3
J1340	1.05	31	117.1	37.3
J1628	1.05	30	116.1	37.3
J1364	1.05	30	116.1	37.3
J1288	1.05	33	119.1	37.3
J1262	1.05	34	120.2	37.3
J1446	1.05	28	114.2	37.3
J1450	1.05	28	114.2	37.3
J1444	1.05	28	114.2	37.3
J1306	1.05	32	118.3	37.4
J1302	1.05	32	118.3	37.4
J1530	1.05	27	113.5	37.5
J1528	1.05	27	113.5	37.5
J1522	1.05	27	113.5	37.5
J1516	1.05	27	113.5	37.5
J1508	1.05	27	113.5	37.5
J1404	1.05	29	115.5	37.5
J1424	1.05	28	114.5	37.5
J1418	1.05	28	114.7	37.6
J1416	1.05	28	114.7	37.6
J1270	1.05	33	119.7	37.6
J1348	1.05	30	116.7	37.6
J1494	1.05	27	113.7	37.6
J1344	1.05	30	116.8	37.6
J28	1.05	29	115.9	37.7
J1374	1.05	29	115.9	37.7
J26	1.05	29	116.0	37.7
J1368	1.05	29	116.0	37.7
J1250	1.05	34	121.2	37.8
J1436	1.05	27	114.3	37.8
J1336	1.05	30	117.3	37.8
J1316	1.05	30	117.4	37.9
J1354	1.05	29	116.5	37.9
J1356	1.05	29	116.5	37.9
J1236	1.05	34	121.6	37.9
J1466	1.05	27	114.6	38.0
J1420	1.05	27	114.7	38.0
J1118	1.05	34	121.8	38.0
J1394	1.05	28	115.9	38.1
J1392	1.05	28	115.9	38.1
J1388	1.05	28	115.9	38.1

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J914	1.05	51	138.9	38.1
J1630	1.05	28	115.9	38.1
J1390	1.05	28	115.9	38.1
J1386	1.05	28	115.9	38.1
J1382	1.05	28	115.9	38.1
J1380	1.05	28	115.9	38.1
J1378	1.05	28	115.9	38.1
J1448	1.05	26	114.2	38.2
J1362	1.05	28	116.2	38.2
J1624	1.05	28	116.2	38.2
J1478	1.05	26	114.2	38.2
J1358	1.05	28	116.3	38.2
J1480	1.05	26	114.3	38.3
J1476	1.05	26	114.3	38.3
J1330	1.05	29	117.3	38.3
J1322	1.05	29	117.3	38.3
J1472	1.05	26	114.3	38.3
J1328	1.05	29	117.3	38.3
J1408	1.05	27	115.4	38.3
J1428	1.05	26	114.4	38.3
J1468	1.05	26	114.5	38.3
J1622	1.05	28	116.5	38.3
J1512	1.05	25	113.5	38.3
J1276	1.05	31	119.5	38.4
J1352	1.05	28	116.5	38.4
J1464	1.05	26	114.6	38.4
J1402	1.05	27	115.6	38.4
J1534	1.05	27	115.7	38.4
J1398	1.05	27	115.7	38.4
J1460	1.05	26	114.8	38.5
J1456	1.05	26	114.9	38.5
J18	1.05	35	124.0	38.5
J1114	1.05	34	123.0	38.5
J1452	1.05	26	115.1	38.6
J1154	1.05	35	124.2	38.7
J1098	1.05	35	124.3	38.7
J1334	1.05	28	117.3	38.7
J1412	1.05	26	115.3	38.7
J1308	1.05	29	118.3	38.7
J1294	1.05	29	118.3	38.7
J1320	1.05	28	117.4	38.7
J1338	1.05	28	117.4	38.7
J1670	1.05	27	116.6	38.8
J1290	1.05	29	118.7	38.9
J1640	1.05	33	122.8	38.9
J1642	1.05	33	122.8	38.9
J1372	1.05	26	115.8	38.9
J40	1.05	26	115.9	38.9
J1298	1.05	28	117.9	39.0
J58	1.05	34	124.0	39.0
J1268	1.05	30	120.0	39.0
J96	1.05	34	124.0	39.0
J98	1.05	34	124.0	39.0

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J100	1.05	34	124.0	39.0
FH-2	1.05	34	124.0	39.0
J104	1.05	34	124.0	39.0
J132	1.05	34	124.0	39.0
J1264	1.05	30	120.2	39.1
J1484	1.05	24	114.3	39.1
J1482	1.05	24	114.3	39.1
J1312	1.05	28	118.3	39.1
J1324	1.05	27	117.3	39.1
J1058	1.05	35	125.3	39.1
J1318	1.05	27	117.4	39.2
J1314	1.05	27	117.4	39.2
J1240	1.05	31	121.5	39.2
J1238	1.05	31	121.5	39.2
J54	1.05	33	123.5	39.2
J1110	1.05	33	123.6	39.2
J262	1.05	35	125.7	39.3
J260	1.05	35	125.7	39.3
J1108	1.05	33	123.7	39.3
J258	1.05	35	125.7	39.3
J1274	1.05	29	119.7	39.3
J1350	1.05	26	116.7	39.3
J1048	1.05	35	125.8	39.4
J1532	1.05	25	115.9	39.4
J76	1.05	33	123.9	39.4
J16	1.05	33	123.9	39.4
J74	1.05	33	124.0	39.4
J78	1.05	33	124.0	39.4
J1070	1.05	34	125.0	39.4
J80	1.05	33	124.0	39.4
J84	1.05	33	124.0	39.4
J88	1.05	33	124.0	39.4
J90	1.05	33	124.0	39.4
J1286	1.05	28	119.1	39.5
J1064	1.05	34	125.1	39.5
J1252	1.05	30	121.2	39.5
J1284	1.05	28	119.2	39.5
J1148	1.05	33	124.2	39.5
J1618	1.05	26	117.3	39.6
J1060	1.05	34	125.3	39.6
J1620	1.05	26	117.3	39.6
J1326	1.05	26	117.3	39.6
J1310	1.05	27	118.3	39.6
J152	1.05	33	124.4	39.6
J156	1.05	33	124.5	39.6
J162	1.05	33	124.5	39.7
J160	1.05	33	124.5	39.7
J52	1.05	32	123.6	39.7
J166	1.05	33	124.6	39.7
J1260	1.05	29	120.6	39.7
J170	1.05	33	124.6	39.7
J1256	1.05	29	120.7	39.7
J1106	1.05	32	123.7	39.7

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J1272	1.05	28	119.7	39.7
J174	1.05	33	124.7	39.7
J180	1.05	33	124.7	39.8
J178	1.05	33	124.8	39.8
J182	1.05	33	124.8	39.8
J56	1.05	32	123.8	39.8
J186	1.05	33	124.8	39.8
J190	1.05	33	124.8	39.8
J204	1.05	33	124.9	39.8
J60	1.05	32	123.9	39.8
J14	1.05	32	123.9	39.8
J208	1.05	33	125.0	39.8
J212	1.05	33	125.0	39.8
J218	1.05	33	125.1	39.9
J216	1.05	33	125.1	39.9
J220	1.05	33	125.1	39.9
J1066	1.05	33	125.1	39.9
J1152	1.05	32	124.2	40.0
J1090	1.05	32	124.4	40.0
J274	1.05	34	126.5	40.1
J1054	1.05	33	125.5	40.1
J172	1.05	32	124.5	40.1
J1112	1.05	31	123.5	40.1
J1234	1.05	30	122.8	40.2
J1076	1.05	32	124.8	40.2
J1230	1.05	30	122.8	40.2
J196	1.05	32	124.9	40.2
J200	1.05	32	124.9	40.2
J10	1.05	31	123.9	40.3
J12	1.05	31	123.9	40.3
J72	1.05	31	123.9	40.3
J92	1.05	31	123.9	40.3
J70	1.05	31	123.9	40.3
J214	1.05	32	125.0	40.3
J1150	1.05	31	124.2	40.4
J1156	1.05	31	124.2	40.4
J48	1.05	30	123.3	40.4
J1332	1.05	24	117.3	40.4
J46	1.05	30	123.3	40.4
J1094	1.05	31	124.3	40.4
J248	1.05	32	125.3	40.4
J246	1.05	32	125.3	40.4
J44	1.05	30	123.3	40.4
J230	1.05	32	125.3	40.4
J228	1.05	32	125.3	40.4
J42	1.05	30	123.4	40.5
J1694	1.05	31	124.4	40.5
J1088	1.05	31	124.4	40.5
J896	1.05	36	129.5	40.5
J1052	1.05	32	125.5	40.5
J272	1.05	33	126.5	40.5
J168	1.05	31	124.6	40.6
J1082	1.05	31	124.6	40.6

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J270	1.05	32	125.7	40.6
J256	1.05	32	125.7	40.6
J1078	1.05	31	124.7	40.6
J268	1.05	32	125.8	40.6
J266	1.05	32	125.8	40.6
J1232	1.05	29	122.8	40.6
J264	1.05	32	125.8	40.6
J1120	1.05	28	121.8	40.6
J202	1.05	31	124.8	40.6
J276	1.05	33	126.9	40.7
J130	1.05	30	123.9	40.7
J222	1.05	31	125.1	40.8
J138	1.05	30	124.1	40.8
J144	1.05	30	124.2	40.8
J142	1.05	30	124.2	40.8
J224	1.05	31	125.2	40.8
J148	1.05	30	124.3	40.8
J226	1.05	31	125.3	40.8
J958	1.05	33	127.3	40.9
J50	1.05	29	123.3	40.9
J992	1.05	35	129.3	40.9
J1716	0.00	32	126.4	40.9
J24	1.05	27	121.5	40.9
J232	1.05	31	125.5	40.9
J254	1.05	30	124.5	40.9
J240	1.05	31	125.5	40.9
J1228	1.05	30	124.5	40.9
J1226	1.05	30	124.5	40.9
J1224	1.05	30	124.5	40.9
J1222	1.05	30	124.5	40.9
J236	1.05	30	124.5	40.9
J960	1.05	35	129.6	41.0
J1084	1.05	30	124.6	41.0
J184	1.05	30	124.7	41.0
J206	1.05	30	124.8	41.1
J210	1.05	30	124.9	41.1
J62	1.05	29	123.9	41.1
J68	1.05	29	123.9	41.1
J1072	1.05	30	124.9	41.1
J1644	1.05	29	123.9	41.1
J66	1.05	29	123.9	41.1
FH-1	1.05	29	123.9	41.1
J998	1.05	34	129.0	41.2
J1104	1.05	29	124.1	41.2
J1102	1.05	29	124.2	41.2
J1144	1.05	29	124.2	41.3
J1146	1.05	29	124.2	41.3
J1132	1.05	29	124.2	41.3
J1130	1.05	29	124.3	41.3
J1100	1.05	29	124.3	41.3
J1128	1.05	29	124.3	41.3
J1126	1.05	29	124.3	41.3
J1096	1.05	29	124.3	41.3

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J292	1.05	32	127.3	41.3
J280	1.05	32	127.3	41.3
J154	1.05	29	124.4	41.3
J34	1.05	26	121.4	41.4
J164	1.05	29	124.5	41.4
J1220	1.05	29	124.5	41.4
J1216	1.05	29	124.5	41.4
J1214	1.05	29	124.5	41.4
J1124	1.05	29	124.5	41.4
J1606	1.05	43	138.6	41.4
J176	1.05	29	124.7	41.5
J188	1.05	29	124.8	41.5
J968	1.05	34	129.8	41.5
J966	1.05	34	129.8	41.5
J82	1.05	28	123.9	41.6
J94	1.05	28	123.9	41.6
J126	1.05	28	123.9	41.6
J124	1.05	28	123.9	41.6
J128	1.05	28	123.9	41.6
J140	1.05	28	124.1	41.6
J146	1.05	28	124.2	41.7
J150	1.05	28	124.2	41.7
J1142	1.05	28	124.2	41.7
J1138	1.05	28	124.2	41.7
J1034	1.05	30	126.3	41.7
J288	1.05	32	128.3	41.7
J234	1.05	28	124.4	41.8
J1212	1.05	28	124.5	41.8
J1210	1.05	28	124.5	41.8
J1208	1.05	28	124.5	41.8
J1206	1.05	28	124.5	41.8
J1204	1.05	28	124.5	41.8
J1202	1.05	28	124.5	41.8
J1200	1.05	28	124.5	41.8
J1198	1.05	28	124.5	41.8
J1122	1.05	28	124.6	41.8
J1038	1.05	29	125.6	41.9
J1036	1.05	29	125.7	41.9
J1178	1.05	28	124.7	41.9
J22	1.05	25	121.7	41.9
J924	1.05	42	138.7	41.9
J1190	1.05	27	123.8	41.9
J20	1.05	25	121.8	42.0
J1030	1.05	29	125.8	42.0
J964	1.05	33	129.9	42.0
J64	1.05	27	123.9	42.0
J102	1.05	27	123.9	42.0
J1024	1.05	29	125.9	42.0
J120	1.05	27	124.0	42.0
J118	1.05	27	124.0	42.0
J894	1.05	33	130.1	42.1
J1140	1.05	27	124.2	42.1
J1136	1.05	27	124.2	42.1

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J1134	1.05	27	124.2	42.1
J1192	1.05	27	124.3	42.2
J296	1.05	32	129.4	42.2
J1092	1.05	27	124.4	42.2
J238	1.05	27	124.4	42.2
J1160	1.05	27	124.5	42.3
J1158	1.05	27	124.5	42.3
J1086	1.05	27	124.6	42.3
J1180	1.05	27	124.6	42.3
J1188	1.05	26	123.6	42.3
J1186	1.05	26	123.6	42.3
J1176	1.05	26	123.6	42.3
J1536	1.05	27	124.7	42.3
J1166	1.05	27	124.7	42.3
J974	1.05	32	129.7	42.3
J1582	1.05	32	129.8	42.4
J1184	1.05	26	123.8	42.4
J1174	1.05	26	123.8	42.4
J278	1.05	29	126.8	42.4
J890	1.05	33	130.8	42.4
J1026	1.05	28	125.9	42.4
J86	1.05	26	123.9	42.4
J962	1.05	32	129.9	42.4
J116	1.05	26	124.0	42.5
J996	1.05	31	129.0	42.5
J134	1.05	26	124.0	42.5
J994	1.05	31	129.0	42.5
J114	1.05	26	124.0	42.5
J1674	1.05	33	131.1	42.5
J1542	1.05	56	154.2	42.6
J286	1.05	27	125.2	42.6
J284	1.05	27	125.2	42.6
J956	1.05	29	127.3	42.6
J1182	1.05	26	124.3	42.6
J1672	1.05	29	127.3	42.6
J1538	1.05	26	124.3	42.6
J294	1.05	31	129.4	42.6
J252	1.05	26	124.4	42.6
J242	1.05	27	125.5	42.7
J1162	1.05	26	124.5	42.7
J1648	1.05	26	124.5	42.7
J1194	1.05	26	124.6	42.7
J1168	1.05	26	124.6	42.7
J1608	1.05	40	138.6	42.7
J1196	1.05	26	124.6	42.7
J1610	1.05	31	129.7	42.8
J972	1.05	31	129.7	42.8
J970	1.05	31	129.7	42.8
J1080	1.05	26	124.7	42.8
J1164	1.05	26	124.8	42.8
J1646	1.05	26	124.8	42.8
J892	1.05	32	130.8	42.8
J1028	1.05	27	125.8	42.8

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J1042	1.05	30	128.9	42.9
J1044	1.05	30	128.9	42.9
J1040	1.05	30	128.9	42.9
J1012	1.05	30	128.9	42.9
J1074	1.05	26	124.9	42.9
J112	1.05	25	124.0	42.9
J108	1.05	25	124.0	42.9
J136	1.05	25	124.0	42.9
J122	1.05	25	124.0	42.9
J110	1.05	25	124.0	42.9
J106	1.05	25	124.0	42.9
J1062	1.05	26	125.3	43.0
J1032	1.05	27	126.3	43.0
J980	1.05	30	129.3	43.1
J250	1.05	25	124.4	43.1
J244	1.05	26	125.4	43.1
J976	1.05	30	129.4	43.1
J158	1.05	25	124.4	43.1
J880	1.05	36	135.5	43.1
J1170	1.05	25	124.6	43.1
J888	1.05	34	133.6	43.1
J1550	1.05	55	154.7	43.2
J686	1.05	55	154.7	43.2
J1652	1.05	55	154.7	43.2
J680	1.05	55	154.7	43.2
J194	1.05	25	124.8	43.3
J192	1.05	25	124.8	43.3
J952	1.05	27	126.8	43.3
J198	1.05	25	124.8	43.3
J546	1.05	54	153.9	43.3
J954	1.05	27	127.0	43.3
J950	1.05	27	127.0	43.3
J1068	1.05	25	125.1	43.4
J282	1.05	27	127.3	43.4
J632	1.05	54	154.3	43.4
J884	1.05	34	134.3	43.5
J978	1.05	29	129.7	43.6
J984	1.05	29	129.9	43.7
J1016	1.05	28	128.9	43.7
J1014	1.05	28	128.9	43.7
J1010	1.05	28	128.9	43.7
J1008	1.05	28	128.9	43.7
J298	1.05	30	131.1	43.8
J1020	1.05	27	128.4	43.9
J1022	1.05	27	128.4	44.0
J1018	1.05	27	128.4	44.0
J870	1.05	36	137.5	44.0
J948	1.05	28	129.5	44.0
J1056	1.05	24	125.5	44.0
J316	1.05	33	134.7	44.1
J854	1.05	38	140.4	44.4
J852	1.05	38	140.4	44.4
J856	1.05	38	140.5	44.4

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J882	1.05	33	135.5	44.4
J1616	1.05	27	129.6	44.5
J990	1.05	27	129.6	44.5
J988	1.05	27	129.6	44.5
J1614	1.05	27	129.7	44.5
J986	1.05	27	129.7	44.5
J1046	1.05	26	128.9	44.6
J312	1.05	32	134.9	44.6
J1006	1.05	26	129.1	44.7
J1004	1.05	26	129.1	44.7
J1002	1.05	26	129.1	44.7
J848	1.05	39	142.2	44.7
J630	1.05	51	154.3	44.7
J290	1.05	25	128.3	44.8
J982	1.05	26	129.4	44.8
J1218	1.05	21	124.5	44.8
J844	1.05	39	142.7	44.9
J842	1.05	39	142.8	45.0
J858	1.05	36	139.9	45.0
J886	1.05	30	134.3	45.2
J1000	1.05	25	129.3	45.2
J926	1.05	34	138.7	45.4
J668	1.05	50	154.7	45.4
J666	1.05	50	154.7	45.4
J328	1.05	32	136.9	45.5
J302	1.05	26	131.1	45.5
J304	1.05	26	131.1	45.5
J300	1.05	26	131.1	45.5
J314	1.05	29	134.6	45.7
J318	1.05	29	134.6	45.7
J1604	1.05	33	138.6	45.8
J324	1.05	29	134.7	45.8
J322	1.05	28	134.5	46.2
J310	1.05	28	134.9	46.3
J850	1.05	35	142.1	46.4
J306	1.05	27	134.6	46.6
J320	1.05	27	134.6	46.6
J846	1.05	35	142.7	46.7
J878	1.05	25	133.5	47.0
J916	1.05	30	138.7	47.1
J332	1.05	28	136.9	47.2
J330	1.05	28	136.9	47.2
J348	1.05	33	142.0	47.2
J1580	1.05	30	139.2	47.3
J898	1.05	20	129.4	47.4
J932	1.05	29	138.6	47.5
J934	1.05	29	138.6	47.5
J936	1.05	29	138.6	47.5
J938	1.05	29	138.6	47.5
J308	1.05	26	135.7	47.5
J920	1.05	29	138.7	47.5
J918	1.05	29	138.7	47.5
J874	1.05	27	137.3	47.8

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J872	1.05	27	137.3	47.8
J338	1.05	30	140.3	47.8
J340	1.05	30	140.3	47.8
J336	1.05	30	140.3	47.8
J930	1.05	28	138.6	47.9
J928	1.05	28	138.6	47.9
J386	1.05	34	145.2	48.2
J326	1.05	25	136.9	48.5
J342	1.05	30	142.1	48.6
J1576	1.05	27	139.2	48.6
J876	1.05	25	137.2	48.6
J350	1.05	30	142.3	48.6
J788	1.05	38	151.0	49.0
J1578	1.05	26	139.2	49.0
J352	1.05	29	142.2	49.0
J922	1.05	25	138.6	49.2
J334	1.05	27	140.8	49.3
J790	1.05	37	151.0	49.4
J1650	1.05	28	142.1	49.4
J354	1.05	28	142.2	49.5
J356	1.05	28	142.2	49.5
J946	1.05	24	138.4	49.6
J384	1.05	31	145.7	49.7
J1678	1.05	29	144.0	49.8
J1666	1.05	36	151.0	49.9
J362	1.05	27	142.1	49.9
J370	1.05	30	145.1	49.9
J394	1.05	30	145.1	49.9
J396	1.05	30	145.1	49.9
J398	1.05	30	145.1	49.9
J358	1.05	27	142.2	49.9
J368	1.05	29	144.2	49.9
J944	1.05	23	138.4	50.0
J942	1.05	23	138.4	50.0
J940	1.05	23	138.6	50.1
J420	1.05	35	150.8	50.2
J900	1.05	23	138.8	50.2
J372	1.05	30	145.9	50.2
J830	1.05	35	151.0	50.3
J786	1.05	35	151.0	50.3
J784	1.05	35	151.0	50.3
J782	1.05	35	151.0	50.3
J1540	1.05	26	142.0	50.3
J380	1.05	29	145.1	50.3
J344	1.05	26	142.1	50.3
J360	1.05	26	142.2	50.3
J800	1.05	41	157.7	50.6
J378	1.05	29	145.8	50.6
J374	1.05	30	146.8	50.6
J1600	1.05	30	146.9	50.6
J1602	1.05	30	146.9	50.7
J768	1.05	34	151.0	50.7
J770	1.05	34	151.0	50.7

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J776	1.05	34	151.0	50.7
J346	1.05	25	142.0	50.7
J1676	1.05	25	142.1	50.7
J392	1.05	28	145.1	50.7
J376	1.05	29	146.1	50.7
J390	1.05	28	145.1	50.8
J388	1.05	28	145.2	50.8
J484	1.05	31	148.4	50.9
J382	1.05	28	145.7	51.0
J1548	1.05	37	154.7	51.0
J674	1.05	37	154.7	51.0
J838	1.05	34	151.9	51.1
J402	1.05	30	148.0	51.1
J772	1.05	33	151.0	51.1
J364	1.05	24	142.0	51.1
J400	1.05	30	148.1	51.2
J366	1.05	24	142.1	51.2
J430	1.05	32	150.3	51.3
J862	1.05	21	139.3	51.3
J432	1.05	32	150.4	51.3
J860	1.05	21	139.4	51.3
J480	1.05	30	148.4	51.3
J606	1.05	35	153.8	51.5
J568	1.05	35	153.8	51.5
J840	1.05	33	151.9	51.5
J444	1.05	30	149.0	51.5
J410	1.05	30	149.0	51.6
J446	1.05	30	149.0	51.6
J448	1.05	30	149.0	51.6
J408	1.05	29	148.0	51.6
J466	1.05	29	148.0	51.6
J468	1.05	29	148.3	51.7
J464	1.05	29	148.4	51.7
J478	1.05	29	148.5	51.8
J434	1.05	31	150.5	51.8
J1592	1.05	34	153.8	51.9
J502	1.05	34	153.8	51.9
J902	1.05	19	138.8	51.9
J906	1.05	19	138.9	51.9
J908	1.05	19	138.9	51.9
J912	1.05	19	138.9	51.9
J910	1.05	19	138.9	51.9
J904	1.05	19	138.9	51.9
J1680	1.05	31	151.0	52.0
J866	1.05	19	139.0	52.0
J864	1.05	19	139.0	52.0
J404	1.05	28	148.0	52.0
J406	1.05	28	148.0	52.0
J462	1.05	29	149.1	52.1
J724	1.05	37	157.2	52.1
J726	1.05	37	157.2	52.1
J474	1.05	28	148.4	52.2
J496	1.05	33	153.5	52.2

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J460	1.05	30	150.7	52.3
J722	1.05	36	156.8	52.3
J472	1.05	30	150.8	52.3
J454	1.05	30	150.8	52.4
J458	1.05	30	150.9	52.4
J566	1.05	33	153.9	52.4
J602	1.05	33	153.9	52.4
J428	1.05	29	150.0	52.4
J766	1.05	35	156.1	52.5
J482	1.05	27	148.3	52.6
J494	1.05	31	152.5	52.7
J422	1.05	29	150.6	52.7
J792	1.05	30	151.6	52.7
J426	1.05	29	150.7	52.7
J424	1.05	29	150.7	52.7
J486	1.05	30	151.7	52.7
J692	1.05	33	154.7	52.8
J418	1.05	29	150.8	52.8
J416	1.05	29	150.8	52.8
J470	1.05	29	150.8	52.8
J570	1.05	32	153.9	52.8
J1698	1.05	30	151.9	52.8
J572	1.05	32	153.9	52.8
J868	1.05	17	139.0	52.8
J442	1.05	27	149.0	52.8
J440	1.05	27	149.0	52.9
J750	1.05	30	152.3	53.0
J738	1.05	35	157.4	53.0
J736	1.05	35	157.4	53.1
J732	1.05	35	157.5	53.1
J728	1.05	35	157.5	53.1
J730	1.05	35	157.5	53.1
J488	1.05	29	151.6	53.1
J1590	1.05	29	151.7	53.2
J1662	1.05	34	156.7	53.2
J762	1.05	34	156.7	53.2
J1664	1.05	34	156.7	53.2
J514	1.05	31	153.7	53.2
J512	1.05	31	153.8	53.2
J1702	1.05	34	156.8	53.2
J530	1.05	31	153.9	53.2
J748	1.05	29	151.9	53.3
J438	1.05	26	149.0	53.3
J490	1.05	29	152.0	53.3
J760	1.05	33	156.2	53.4
J710	1.05	36	159.3	53.4
J754	1.05	29	152.7	53.6
J688	1.05	31	154.7	53.6
J548	1.05	30	153.7	53.6
J1588	1.05	27	150.8	53.6
J556	1.05	30	153.8	53.6
J648	1.05	31	154.8	53.6
J646	1.05	31	154.8	53.6

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J540	1.05	30	153.9	53.7
J544	1.05	30	153.9	53.7
J746	1.05	28	151.9	53.7
J414	1.05	24	148.0	53.7
J774	1.05	27	151.0	53.7
J412	1.05	24	148.0	53.7
J450	1.05	27	151.1	53.8
J1718	0.00	27	151.2	53.8
J452	1.05	27	151.2	53.8
J712	1.05	35	159.3	53.9
J622	1.05	30	154.3	53.9
J476	1.05	24	148.4	53.9
J456	1.05	27	151.4	53.9
J614	1.05	28	152.5	53.9
J1612	1.05	27	151.6	54.0
J616	1.05	30	154.7	54.0
J756	1.05	28	152.7	54.0
J500	1.05	27	151.7	54.1
J678	1.05	30	154.7	54.1
J536	1.05	29	153.7	54.1
J664	1.05	30	154.7	54.1
J1658	1.05	30	154.8	54.1
J508	1.05	29	153.8	54.1
J1584	1.05	26	150.8	54.1
J492	1.05	29	153.8	54.1
J510	1.05	29	153.8	54.1
J436	1.05	26	150.8	54.1
J1682	1.05	33	157.8	54.1
J742	1.05	33	157.8	54.1
J634	1.05	30	154.8	54.1
J636	1.05	30	154.8	54.1
J628	1.05	30	154.8	54.1
J524	1.05	29	153.9	54.1
J626	1.05	30	154.9	54.1
J498	1.05	27	151.9	54.1
J520	1.05	27	151.9	54.1
J744	1.05	27	151.9	54.1
J582	1.05	29	154.0	54.2
J600	1.05	29	154.0	54.2
J1546	1.05	29	154.1	54.2
J598	1.05	29	154.1	54.2
J542	1.05	29	154.1	54.2
J624	1.05	29	154.3	54.3
J574	1.05	29	154.4	54.3
J576	1.05	29	154.4	54.3
J734	1.05	32	157.5	54.4
J584	1.05	29	154.5	54.4
J586	1.05	29	154.5	54.4
J590	1.05	29	154.5	54.4
J588	1.05	29	154.5	54.4
J720	1.05	31	156.7	54.4
J592	1.05	29	154.7	54.5
J550	1.05	28	153.7	54.5

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J684	1.05	29	154.7	54.5
J1692	1.05	29	154.7	54.5
J662	1.05	29	154.7	54.5
J1586	1.05	25	150.8	54.5
J718	1.05	31	156.8	54.5
J716	1.05	31	156.8	54.5
J654	1.05	29	154.8	54.5
J528	1.05	28	153.8	54.5
J516	1.05	26	151.9	54.6
J526	1.05	28	153.9	54.6
J780	1.05	25	151.0	54.6
J778	1.05	25	151.0	54.6
J538	1.05	28	154.0	54.6
J580	1.05	28	154.0	54.6
J644	1.05	29	155.1	54.6
J752	1.05	30	156.1	54.6
J558	1.05	28	154.2	54.7
J560	1.05	28	154.2	54.7
J532	1.05	27	153.5	54.8
J534	1.05	27	153.6	54.9
J518	1.05	27	153.7	54.9
J1688	1.05	28	154.7	54.9
J690	1.05	28	154.7	54.9
J682	1.05	28	154.7	54.9
J650	1.05	28	154.8	54.9
J676	1.05	28	154.8	54.9
J1700	1.05	30	156.8	54.9
J1686	1.05	30	156.9	55.0
J564	1.05	27	154.0	55.0
J834	1.05	24	151.0	55.0
J640	1.05	28	155.1	55.1
J1544	1.05	27	154.3	55.1
J522	1.05	26	153.3	55.2
J708	1.05	32	159.3	55.2
J618	1.05	27	154.4	55.2
J620	1.05	27	154.4	55.2
J610	1.05	25	152.5	55.2
J658	1.05	27	154.6	55.3
J656	1.05	27	154.6	55.3
J672	1.05	27	154.7	55.3
J1654	1.05	27	154.7	55.4
J1656	1.05	27	154.7	55.4
J1690	1.05	27	154.7	55.4
J638	1.05	27	154.8	55.4
J802	1.05	30	157.8	55.4
J562	1.05	26	154.0	55.5
J578	1.05	26	154.0	55.5
J714	1.05	30	158.3	55.6
J1566	1.05	29	157.4	55.6
J612	1.05	24	152.4	55.7
J554	1.05	25	153.6	55.7
J552	1.05	25	153.6	55.7
J594	1.05	26	154.7	55.8

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J504	1.05	25	153.7	55.8
J652	1.05	26	154.7	55.8
J608	1.05	24	152.8	55.8
J694	1.05	28	156.9	55.9
J1660	1.05	28	156.9	55.9
J596	1.05	26	155.2	56.0
J696	1.05	30	159.3	56.0
J764	1.05	26	155.5	56.1
J758	1.05	26	155.5	56.1
J660	1.05	25	154.6	56.2
J506	1.05	24	153.7	56.2
J670	1.05	25	154.7	56.2
J604	1.05	23	152.8	56.2
J642	1.05	25	155.0	56.4
J706	1.05	29	159.3	56.5
J704	1.05	29	159.3	56.5
J702	1.05	29	159.3	56.5
J698	1.05	29	159.3	56.5
J1684	1.05	29	159.3	56.5
J740	1.05	27	157.5	56.5
J700	1.05	28	159.3	56.9
J1568	1.05	25	157.4	57.4
J832	1.05	18	151.0	57.6
J828	1.05	18	151.0	57.7
J826	1.05	18	151.0	57.7
J1708	1.05	26	159.4	57.8
J1564	1.05	24	157.4	57.8
J1570	1.05	22	157.5	58.7
J810	1.05	22	157.8	58.8
J1574	1.05	22	157.8	58.8
J1704	1.05	22	157.8	58.8
J798	1.05	22	157.8	58.8
J804	1.05	22	157.8	58.8
J1562	1.05	21	157.6	59.2
J796	1.05	21	157.8	59.3
J794	1.05	21	157.8	59.3
J1572	1.05	20	157.4	59.5
J1560	1.05	20	157.5	59.6
J808	1.05	20	157.8	59.7
J1706	1.05	20	157.8	59.7
J806	1.05	20	157.8	59.7
J818	1.05	19	157.8	60.1
J816	1.05	19	157.8	60.1
J814	1.05	19	157.8	60.1
J812	1.05	19	157.8	60.1
J1598	1.05	18	157.3	60.3
J1596	1.05	18	157.3	60.4
J1594	1.05	18	157.3	60.4
J1552	1.05	18	157.3	60.4
J1554	1.05	18	157.3	60.4
J1556	1.05	18	157.4	60.4
J824	1.05	18	157.7	60.5
J822	1.05	18	157.7	60.6

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J820	1.05	18	157.8	60.6
J1558	1.05	17	157.4	60.9
J1696	1.05	0	151.8	65.8

Scenario: 2021 Available Residential Fire Flow
Sorted from lowest to highest fire flow

ID	Static Demand (gpm)	Static Pressure (psi)	Fire-Flow Demand (gpm)	Design Flow (gpm)
J1482	0.59	187.5	750	558
J1480	0.59	186.64	750	572
FH-1	0.59	96.73	750	592
J16	0.59	95.00	750	594
FH-2	0.59	94.58	750	672
J710	0.59	97.34	750	680
J144	0.59	96.34	750	710
J692	0.59	98.6	750	754
J1670	0.59	186.55	750	762
J162	0.59	95.08	750	764
J688	0.59	99.46	750	766
J1690	0.59	101.20	750	767
J1158	0.59	97.71	750	775
J242	0.59	97.83	750	780
J1692	0.59	100.33	750	784
J1688	0.59	100.76	750	816
J190	0.59	95.13	750	819
J192	0.59	98.59	750	819
J194	0.59	98.59	750	819
J362	0.59	100.18	750	853
J268	0.59	95.7	750	898
J1676	0.59	101.05	750	904
J1716	0	95.86	750	909
J1694	0.59	95.97	750	910
J1672	0.59	97.22	750	922
J952	0.59	98.10	750	923
J328	0.59	97.28	750	933
J502	0.59	98.20	750	993
J1658	0.59	99.9	750	1,008
J1674	0.59	96.02	750	1,020
J1706	0.59	104.27	750	1,129
J326	0.59	100.32	750	1,241
J518	0.59	101.24	750	1,409
J814	0.59	104.71	750	1,455
J446	0.59	99.87	750	1,496
J1678	0.59	99.59	750	1,548
J1684	0.59	100.37	750	1,813
J794	0.59	103.84	750	2,051
J1704	0.59	103.41	750	2,177
J1702	0.59	98.24	750	2,282
J724	0.59	96.93	750	2,292
J1700	0.59	99.97	750	2,384
J1686	0.59	99.94	750	2,676
J426	0.59	100.55	750	2,873
J472	0.59	100.13	750	2,928
J1680	0.59	99.72	750	3,032
J1682	0.59	98.64	750	3,109
J450	0.59	101.47	750	3,131
J1698	0.59	100.24	750	3,467
J792	0.59	100.29	750	3,604
J1708	0.59	101.67	750	3,761

Reservoir	Level
North Wellfield	37.28
South Wellfield	32.63

Applicable Fire Storage Requirement

750 gpm for 60 minutes

Booster Pump	Capacity (gpm)	Status
NWF N-1	109	ON
NWF N-2	120	ON
NWF N-3	280	ON
NWF N-4	500	ON
NWF N-5	500	OFF
NWF N-6	120	ON
NWF N-7	120	ON
NWF N-8	120	ON
SWF S-1	175	ON
SWF S-2	175	ON
SWF S-3	750	ON
SWF S-4	750	ON

System Improvements

Project D-1: A booster pump station serving Birch Place, south of 227th Street

Unrestrict the South Wellfield Booster Pump Station Discharge

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J30	1.00	31	120.2	38.7
J1050	1.00	40	129.4	38.7
J38	1.00	30	120.1	39.1
J36	1.00	30	120.1	39.1
J32	1.00	30	120.1	39.1
J914	1.00	51	141.4	39.2
J28	1.00	29	120.4	39.6
J26	1.00	29	120.4	39.6
J18	1.00	35	127.7	40.2
J1154	1.00	35	128.0	40.3
J1098	1.00	35	128.0	40.3
J1534	1.00	27	120.2	40.4
J58	1.00	34	127.7	40.6
J96	1.00	34	127.8	40.6
J98	1.00	34	127.8	40.6
J100	1.00	34	127.8	40.6
FH-2	1.00	34	127.8	40.6
J104	1.00	34	127.8	40.6
J132	1.00	34	127.8	40.6
J1058	1.00	35	129.0	40.7
J262	1.00	35	129.3	40.9
J260	1.00	35	129.3	40.9
J258	1.00	35	129.3	40.9
J40	1.00	26	120.3	40.9
J54	1.00	33	127.3	40.9
J1048	1.00	35	129.4	40.9
J1070	1.00	34	128.6	41.0
J76	1.00	33	127.7	41.0
J16	1.00	33	127.7	41.0
J74	1.00	33	127.7	41.0
J78	1.00	33	127.7	41.0
J80	1.00	33	127.7	41.1
J84	1.00	33	127.7	41.1
J88	1.00	33	127.7	41.1
J90	1.00	33	127.7	41.1
J1064	1.00	34	128.8	41.1
J1060	1.00	34	128.9	41.1
J1148	1.00	33	128.0	41.2
J152	1.00	33	128.1	41.2
J156	1.00	33	128.2	41.2
J162	1.00	33	128.2	41.3
J160	1.00	33	128.2	41.3
J166	1.00	33	128.3	41.3
J170	1.00	33	128.3	41.3
J52	1.00	32	127.4	41.3
J1532	1.00	25	120.4	41.3
J174	1.00	33	128.4	41.3
J180	1.00	33	128.4	41.4
J178	1.00	33	128.4	41.4
J182	1.00	33	128.5	41.4
J186	1.00	33	128.5	41.4
J190	1.00	33	128.5	41.4
J56	1.00	32	127.6	41.4

Reservoir	Level
North Wellfield	40.0
South Wellfield	35.0

Applicable Fire Storage Requirement

Not Applicable

Booster Pump	Capacity (gpm)	Status
NWF N-1	109	ON
NWF N-2	120	ON
NWF N-3	280	ON
NWF N-4	500	OFF
NWF N-5	500	OFF
NWF N-6	120	ON
NWF N-7	120	ON
NWF N-8	120	ON
SWF S-1	175	ON
SWF S-2	175	ON
SWF S-3	750	OFF
SWF S-4	750	OFF

System Improvements

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J204	1.00	33	128.6	41.4
J208	1.00	33	128.6	41.4
J212	1.00	33	128.6	41.4
J60	1.00	32	127.7	41.5
J14	1.00	32	127.7	41.5
J218	1.00	33	128.7	41.5
J216	1.00	33	128.7	41.5
J220	1.00	33	128.7	41.5
J1066	1.00	33	128.8	41.5
J1152	1.00	32	128.0	41.6
J274	1.00	34	130.0	41.6
J1090	1.00	32	128.1	41.7
J1054	1.00	33	129.1	41.7
J172	1.00	32	128.2	41.7
J1076	1.00	32	128.5	41.8
J196	1.00	32	128.5	41.8
J200	1.00	32	128.6	41.8
J214	1.00	32	128.7	41.9
J10	1.00	31	127.7	41.9
J12	1.00	31	127.7	41.9
J72	1.00	31	127.7	41.9
J92	1.00	31	127.7	41.9
J70	1.00	31	127.7	41.9
J896	1.00	36	132.8	41.9
J248	1.00	32	129.0	42.0
J246	1.00	32	129.0	42.0
J1150	1.00	31	128.0	42.0
J230	1.00	32	129.0	42.0
J228	1.00	32	129.0	42.0
J1156	1.00	31	128.0	42.0
J1094	1.00	31	128.1	42.1
J272	1.00	33	130.1	42.1
J48	1.00	30	127.1	42.1
J1694	1.00	31	128.1	42.1
J46	1.00	30	127.1	42.1
J1088	1.00	31	128.1	42.1
J44	1.00	30	127.1	42.1
J1052	1.00	32	129.2	42.1
J42	1.00	30	127.2	42.1
J168	1.00	31	128.3	42.2
J1082	1.00	31	128.3	42.2
J270	1.00	32	129.3	42.2
J256	1.00	32	129.3	42.2
J268	1.00	32	129.4	42.2
J266	1.00	32	129.4	42.2
J264	1.00	32	129.4	42.2
J276	1.00	33	130.4	42.2
J1078	1.00	31	128.4	42.2
J202	1.00	31	128.5	42.2
J992	1.00	35	132.6	42.3
J130	1.00	30	127.7	42.3
J222	1.00	31	128.7	42.4
J958	1.00	33	130.8	42.4

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J960	1.00	35	132.9	42.4
J138	1.00	30	127.9	42.4
J224	1.00	31	128.9	42.4
J226	1.00	31	128.9	42.4
J144	1.00	30	128.0	42.4
J142	1.00	30	128.0	42.4
J1716	0.00	32	130.0	42.4
J148	1.00	30	128.0	42.5
J232	1.00	31	129.1	42.5
J240	1.00	31	129.1	42.5
J50	1.00	29	127.1	42.5
J1606	1.00	43	141.1	42.5
J254	1.00	30	128.2	42.5
J236	1.00	30	128.2	42.6
J1228	1.00	30	128.2	42.6
J1226	1.00	30	128.2	42.6
J1224	1.00	30	128.2	42.6
J1222	1.00	30	128.2	42.6
J1084	1.00	30	128.3	42.6
J998	1.00	34	132.3	42.6
J184	1.00	30	128.4	42.6
J24	1.00	27	125.4	42.7
J206	1.00	30	128.5	42.7
J210	1.00	30	128.6	42.7
J1072	1.00	30	128.6	42.7
J62	1.00	29	127.7	42.8
J68	1.00	29	127.7	42.8
J1644	1.00	29	127.7	42.8
J66	1.00	29	127.7	42.8
FH-1	1.00	29	127.7	42.8
J292	1.00	32	130.8	42.8
J280	1.00	32	130.8	42.8
J1104	1.00	29	127.9	42.8
J1102	1.00	29	127.9	42.9
J1144	1.00	29	128.0	42.9
J1146	1.00	29	128.0	42.9
J1132	1.00	29	128.0	42.9
J1130	1.00	29	128.0	42.9
J1542	1.00	56	155.0	42.9
J1128	1.00	29	128.0	42.9
J1100	1.00	29	128.0	42.9
J1126	1.00	29	128.0	42.9
J1096	1.00	29	128.0	42.9
J968	1.00	34	133.0	42.9
J966	1.00	34	133.1	42.9
J154	1.00	29	128.1	42.9
J164	1.00	29	128.2	43.0
J924	1.00	42	141.2	43.0
J1220	1.00	29	128.2	43.0
J1216	1.00	29	128.2	43.0
J1214	1.00	29	128.2	43.0
J1124	1.00	29	128.2	43.0
J176	1.00	29	128.4	43.1

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J34	1.00	26	125.4	43.1
J188	1.00	29	128.4	43.1
J82	1.00	28	127.7	43.2
J94	1.00	28	127.7	43.2
J126	1.00	28	127.7	43.2
J124	1.00	28	127.7	43.2
J128	1.00	28	127.7	43.2
J288	1.00	32	131.7	43.2
J140	1.00	28	127.8	43.2
J1034	1.00	30	129.9	43.3
J146	1.00	28	127.9	43.3
J150	1.00	28	127.9	43.3
J1142	1.00	28	128.0	43.3
J1138	1.00	28	128.0	43.3
J964	1.00	33	133.1	43.4
J234	1.00	28	128.1	43.4
J1212	1.00	28	128.2	43.4
J1210	1.00	28	128.2	43.4
J1208	1.00	28	128.2	43.4
J1206	1.00	28	128.2	43.4
J1204	1.00	28	128.2	43.4
J1202	1.00	28	128.2	43.4
J1200	1.00	28	128.2	43.4
J1198	1.00	28	128.2	43.4
J1038	1.00	29	129.3	43.4
J1036	1.00	29	129.3	43.5
J1122	1.00	28	128.3	43.5
J894	1.00	33	133.3	43.5
J1178	1.00	28	128.4	43.5
J1550	1.00	55	155.4	43.5
J686	1.00	55	155.4	43.5
J1652	1.00	55	155.4	43.5
J680	1.00	55	155.4	43.5
J1030	1.00	29	129.5	43.5
J1024	1.00	29	129.5	43.6
J1190	1.00	27	127.5	43.6
J22	1.00	25	125.6	43.6
J296	1.00	32	132.7	43.6
J64	1.00	27	127.7	43.6
J102	1.00	27	127.7	43.6
J546	1.00	54	154.7	43.6
J120	1.00	27	127.7	43.7
J20	1.00	25	125.8	43.7
J118	1.00	27	127.8	43.7
J974	1.00	32	133.0	43.8
J1140	1.00	27	128.0	43.8
J1136	1.00	27	128.0	43.8
J1134	1.00	27	128.0	43.8
J632	1.00	54	155.0	43.8
J890	1.00	33	134.0	43.8
J1192	1.00	27	128.0	43.8
J1582	1.00	32	133.0	43.8
J1092	1.00	27	128.1	43.8

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J238	1.00	27	128.1	43.8
J1608	1.00	40	141.1	43.8
J962	1.00	32	133.2	43.8
J1674	1.00	33	134.2	43.9
J1160	1.00	27	128.2	43.9
J1158	1.00	27	128.2	43.9
J1086	1.00	27	128.3	43.9
J1180	1.00	27	128.3	43.9
J278	1.00	29	130.3	43.9
J996	1.00	31	132.3	43.9
J994	1.00	31	132.3	43.9
J1536	1.00	27	128.4	43.9
J1166	1.00	27	128.4	43.9
J1188	1.00	26	127.4	43.9
J1186	1.00	26	127.4	43.9
J1176	1.00	26	127.4	44.0
J1026	1.00	28	129.5	44.0
J1184	1.00	26	127.6	44.0
J1174	1.00	26	127.6	44.0
J86	1.00	26	127.6	44.0
J294	1.00	31	132.7	44.0
J116	1.00	26	127.7	44.1
J134	1.00	26	127.8	44.1
J956	1.00	29	130.8	44.1
J114	1.00	26	127.8	44.1
J1672	1.00	29	130.8	44.1
J286	1.00	27	128.9	44.2
J284	1.00	27	128.9	44.2
J1610	1.00	31	133.0	44.2
J972	1.00	31	133.0	44.2
J970	1.00	31	133.0	44.2
J892	1.00	32	134.0	44.2
J1182	1.00	26	128.0	44.2
J1538	1.00	26	128.1	44.2
J242	1.00	27	129.1	44.2
J252	1.00	26	128.1	44.3
J1162	1.00	26	128.2	44.3
J1648	1.00	26	128.2	44.3
J1042	1.00	30	132.2	44.3
J1044	1.00	30	132.3	44.3
J1040	1.00	30	132.3	44.3
J1012	1.00	30	132.3	44.3
J1194	1.00	26	128.3	44.3
J880	1.00	36	138.3	44.3
J1168	1.00	26	128.3	44.3
J1196	1.00	26	128.3	44.3
J1080	1.00	26	128.4	44.4
J1028	1.00	27	129.5	44.4
J1164	1.00	26	128.5	44.4
J1646	1.00	26	128.5	44.4
J888	1.00	34	136.5	44.4
J1074	1.00	26	128.6	44.5
J980	1.00	30	132.7	44.5

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J976	1.00	30	132.7	44.5
J112	1.00	25	127.7	44.5
J108	1.00	25	127.8	44.5
J136	1.00	25	127.8	44.5
J122	1.00	25	127.8	44.5
J110	1.00	25	127.8	44.5
J106	1.00	25	127.8	44.5
J1032	1.00	27	129.9	44.6
J1062	1.00	26	128.9	44.6
J244	1.00	26	129.0	44.6
J250	1.00	25	128.1	44.7
J158	1.00	25	128.1	44.7
J884	1.00	34	137.2	44.7
J1170	1.00	25	128.3	44.7
J952	1.00	27	130.3	44.8
J954	1.00	27	130.5	44.8
J950	1.00	27	130.5	44.8
J194	1.00	25	128.5	44.8
J192	1.00	25	128.5	44.8
J198	1.00	25	128.5	44.9
J282	1.00	27	130.7	44.9
J1068	1.00	25	128.8	45.0
J978	1.00	29	133.0	45.1
J630	1.00	51	155.0	45.1
J870	1.00	36	140.1	45.1
J984	1.00	29	133.1	45.1
J298	1.00	30	134.2	45.2
J1016	1.00	28	132.2	45.2
J1014	1.00	28	132.2	45.2
J1010	1.00	28	132.3	45.2
J1008	1.00	28	132.3	45.2
J316	1.00	33	137.6	45.3
J948	1.00	28	132.8	45.4
J854	1.00	38	142.8	45.4
J852	1.00	38	142.8	45.4
J1020	1.00	27	131.8	45.4
J856	1.00	38	142.8	45.4
J1022	1.00	27	131.8	45.4
J1018	1.00	27	131.8	45.4
J1056	1.00	24	129.1	45.6
J882	1.00	33	138.3	45.6
J848	1.00	39	144.4	45.7
J668	1.00	50	155.4	45.7
J666	1.00	50	155.4	45.7
J312	1.00	32	137.7	45.8
J844	1.00	39	144.8	45.9
J1616	1.00	27	132.9	45.9
J990	1.00	27	132.9	45.9
J988	1.00	27	132.9	45.9
J842	1.00	39	144.9	45.9
J1614	1.00	27	133.0	45.9
J986	1.00	27	133.0	45.9
J1046	1.00	26	132.2	46.0

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J858	1.00	36	142.3	46.1
J1006	1.00	26	132.4	46.1
J1004	1.00	26	132.4	46.1
J1002	1.00	26	132.4	46.1
J982	1.00	26	132.7	46.2
J290	1.00	25	131.7	46.2
J926	1.00	34	141.2	46.4
J886	1.00	30	137.2	46.4
J1218	1.00	21	128.2	46.4
J328	1.00	32	139.5	46.6
J1000	1.00	25	132.6	46.6
J1604	1.00	33	141.1	46.9
J304	1.00	26	134.2	46.9
J302	1.00	26	134.2	46.9
J300	1.00	26	134.2	46.9
J314	1.00	29	137.4	47.0
J318	1.00	29	137.4	47.0
J324	1.00	29	137.5	47.0
J850	1.00	35	144.3	47.4
J322	1.00	28	137.4	47.4
J310	1.00	28	137.7	47.5
J846	1.00	35	144.8	47.6
J306	1.00	27	137.4	47.8
J320	1.00	27	137.4	47.8
J916	1.00	30	141.2	48.2
J348	1.00	33	144.2	48.2
J878	1.00	25	136.4	48.3
J332	1.00	28	139.5	48.3
J330	1.00	28	139.5	48.3
J1580	1.00	30	141.6	48.4
J932	1.00	29	141.1	48.6
J934	1.00	29	141.1	48.6
J936	1.00	29	141.1	48.6
J938	1.00	29	141.1	48.6
J920	1.00	29	141.2	48.6
J918	1.00	29	141.2	48.6
J308	1.00	26	138.4	48.7
J338	1.00	30	142.7	48.8
J340	1.00	30	142.7	48.8
J336	1.00	30	142.7	48.8
J898	1.00	20	132.7	48.8
J874	1.00	27	139.9	48.9
J872	1.00	27	139.9	48.9
J386	1.00	34	147.1	49.0
J930	1.00	28	141.1	49.0
J928	1.00	28	141.1	49.0
J342	1.00	30	144.3	49.5
J350	1.00	30	144.4	49.6
J788	1.00	38	152.5	49.6
J326	1.00	25	139.5	49.6
J1576	1.00	27	141.6	49.7
J876	1.00	25	139.9	49.8
J352	1.00	29	144.4	50.0

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J790	1.00	37	152.4	50.0
J1578	1.00	26	141.6	50.1
J334	1.00	27	143.1	50.3
J922	1.00	25	141.1	50.3
J1650	1.00	28	144.2	50.4
J354	1.00	28	144.3	50.4
J356	1.00	28	144.4	50.4
J1666	1.00	36	152.5	50.5
J384	1.00	31	147.6	50.5
J946	1.00	24	140.9	50.7
J370	1.00	30	147.0	50.7
J800	1.00	41	158.0	50.7
J1678	1.00	29	146.0	50.7
J394	1.00	30	147.0	50.7
J396	1.00	30	147.0	50.7
J398	1.00	30	147.1	50.7
J368	1.00	29	146.2	50.8
J420	1.00	35	152.2	50.8
J362	1.00	27	144.2	50.8
J358	1.00	27	144.3	50.8
J830	1.00	35	152.4	50.9
J786	1.00	35	152.5	50.9
J784	1.00	35	152.5	50.9
J782	1.00	35	152.5	50.9
J372	1.00	30	147.8	51.0
J944	1.00	23	140.9	51.1
J942	1.00	23	141.0	51.1
J380	1.00	29	147.0	51.1
J940	1.00	23	141.2	51.2
J1540	1.00	26	144.2	51.2
J344	1.00	26	144.2	51.2
J900	1.00	23	141.3	51.3
J360	1.00	26	144.4	51.3
J1548	1.00	37	155.4	51.3
J674	1.00	37	155.4	51.3
J768	1.00	34	152.5	51.3
J770	1.00	34	152.5	51.3
J776	1.00	34	152.5	51.3
J374	1.00	30	148.6	51.4
J378	1.00	29	147.6	51.4
J1600	1.00	30	148.6	51.4
J1602	1.00	30	148.7	51.4
J376	1.00	29	147.9	51.5
J484	1.00	31	150.0	51.6
J392	1.00	28	147.0	51.6
J390	1.00	28	147.0	51.6
J388	1.00	28	147.1	51.6
J346	1.00	25	144.2	51.7
J1676	1.00	25	144.2	51.7
J838	1.00	34	153.3	51.7
J772	1.00	33	152.5	51.8
J382	1.00	28	147.6	51.8
J606	1.00	35	154.6	51.8

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J568	1.00	35	154.6	51.8
J402	1.00	30	149.7	51.9
J400	1.00	30	149.7	51.9
J430	1.00	32	151.8	51.9
J432	1.00	32	151.8	51.9
J480	1.00	30	150.0	52.0
J364	1.00	24	144.2	52.1
J366	1.00	24	144.2	52.1
J840	1.00	33	153.3	52.1
J724	1.00	37	157.5	52.2
J726	1.00	37	157.5	52.2
J444	1.00	30	150.5	52.2
J410	1.00	30	150.5	52.2
J446	1.00	30	150.5	52.2
J448	1.00	30	150.5	52.2
J1592	1.00	34	154.6	52.3
J502	1.00	34	154.6	52.3
J408	1.00	29	149.7	52.3
J466	1.00	29	149.7	52.3
J862	1.00	21	141.8	52.3
J860	1.00	21	141.8	52.4
J468	1.00	29	149.9	52.4
J434	1.00	31	152.0	52.4
J464	1.00	29	150.1	52.5
J478	1.00	29	150.1	52.5
J722	1.00	36	157.2	52.5
J1680	1.00	31	152.4	52.6
J496	1.00	33	154.4	52.6
J766	1.00	35	156.7	52.7
J404	1.00	28	149.7	52.7
J406	1.00	28	149.7	52.7
J566	1.00	33	154.7	52.7
J462	1.00	29	150.7	52.7
J602	1.00	33	154.7	52.8
J474	1.00	28	150.1	52.9
J460	1.00	30	152.1	52.9
J472	1.00	30	152.2	53.0
J454	1.00	30	152.2	53.0
J458	1.00	30	152.3	53.0
J902	1.00	19	141.3	53.0
J906	1.00	19	141.4	53.0
J908	1.00	19	141.4	53.0
J912	1.00	19	141.4	53.0
J910	1.00	19	141.4	53.0
J904	1.00	19	141.4	53.0
J692	1.00	33	155.4	53.0
J866	1.00	19	141.5	53.1
J864	1.00	19	141.5	53.1
J428	1.00	29	151.5	53.1
J494	1.00	31	153.6	53.1
J738	1.00	35	157.7	53.2
J570	1.00	32	154.7	53.2
J572	1.00	32	154.7	53.2

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J736	1.00	35	157.8	53.2
J732	1.00	35	157.8	53.2
J728	1.00	35	157.8	53.2
J730	1.00	35	157.8	53.2
J482	1.00	27	150.0	53.3
J486	1.00	30	153.0	53.3
J792	1.00	30	153.0	53.3
J422	1.00	29	152.1	53.3
J426	1.00	29	152.1	53.3
J424	1.00	29	152.1	53.3
J1662	1.00	34	157.2	53.4
J762	1.00	34	157.2	53.4
J1664	1.00	34	157.2	53.4
J1702	1.00	34	157.2	53.4
J418	1.00	29	152.2	53.4
J416	1.00	29	152.2	53.4
J470	1.00	29	152.2	53.4
J1698	1.00	30	153.2	53.4
J710	1.00	36	159.3	53.4
J750	1.00	30	153.5	53.5
J442	1.00	27	150.5	53.5
J440	1.00	27	150.5	53.5
J514	1.00	31	154.6	53.6
J512	1.00	31	154.6	53.6
J760	1.00	33	156.7	53.6
J530	1.00	31	154.7	53.6
J488	1.00	29	152.9	53.7
J1590	1.00	29	153.0	53.7
J748	1.00	29	153.2	53.8
J490	1.00	29	153.2	53.8
J712	1.00	35	159.3	53.9
J688	1.00	31	155.4	53.9
J868	1.00	17	141.4	53.9
J648	1.00	31	155.5	53.9
J646	1.00	31	155.5	53.9
J438	1.00	26	150.5	54.0
J1282	1.00	39	163.6	54.0
J548	1.00	30	154.6	54.0
J556	1.00	30	154.6	54.0
J540	1.00	30	154.7	54.0
J544	1.00	30	154.7	54.0
J754	1.00	29	153.9	54.1
J1682	1.00	33	158.1	54.2
J742	1.00	33	158.1	54.2
J622	1.00	30	155.1	54.2
J1346	1.00	36	161.1	54.2
J1588	1.00	27	152.2	54.3
J746	1.00	28	153.2	54.3
J1342	1.00	36	161.3	54.3
J616	1.00	30	155.4	54.3
J614	1.00	28	153.4	54.3
J678	1.00	30	155.4	54.3
J664	1.00	30	155.4	54.4

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J774	1.00	27	152.5	54.4
J1658	1.00	30	155.5	54.4
J450	1.00	27	152.5	54.4
J634	1.00	30	155.5	54.4
J636	1.00	30	155.5	54.4
J628	1.00	30	155.5	54.4
J626	1.00	30	155.5	54.4
J1718	0.00	27	152.6	54.4
J452	1.00	27	152.6	54.4
J536	1.00	29	154.6	54.4
J508	1.00	29	154.6	54.4
J492	1.00	29	154.7	54.4
J510	1.00	29	154.7	54.4
J414	1.00	24	149.7	54.5
J412	1.00	24	149.7	54.5
J524	1.00	29	154.7	54.5
J456	1.00	27	152.7	54.5
J734	1.00	32	157.8	54.5
J582	1.00	29	154.8	54.5
J600	1.00	29	154.8	54.5
J1546	1.00	29	154.8	54.5
J598	1.00	29	154.8	54.5
J756	1.00	28	153.8	54.5
J1612	1.00	27	152.9	54.5
J542	1.00	29	154.9	54.6
J476	1.00	24	150.0	54.6
J500	1.00	27	153.0	54.6
J624	1.00	29	155.1	54.6
J720	1.00	31	157.1	54.6
J574	1.00	29	155.1	54.6
J576	1.00	29	155.1	54.7
J718	1.00	31	157.2	54.7
J498	1.00	27	153.2	54.7
J716	1.00	31	157.2	54.7
J520	1.00	27	153.2	54.7
J1584	1.00	26	152.2	54.7
J744	1.00	27	153.2	54.7
J436	1.00	26	152.2	54.7
J584	1.00	29	155.2	54.7
J590	1.00	29	155.2	54.7
J586	1.00	29	155.3	54.7
J588	1.00	29	155.3	54.7
J592	1.00	29	155.4	54.8
J684	1.00	29	155.4	54.8
J1692	1.00	29	155.4	54.8
J1246	1.00	39	165.4	54.8
J662	1.00	29	155.4	54.8
J654	1.00	29	155.5	54.8
J1280	1.00	37	163.6	54.8
J550	1.00	28	154.6	54.9
J752	1.00	30	156.6	54.9
J528	1.00	28	154.7	54.9
J644	1.00	29	155.7	54.9

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J526	1.00	28	154.8	54.9
J580	1.00	28	154.8	55.0
J538	1.00	28	154.8	55.0
J558	1.00	28	155.0	55.0
J560	1.00	28	155.0	55.0
J1518	1.00	31	158.1	55.1
J1586	1.00	25	152.2	55.1
J516	1.00	26	153.2	55.1
J1700	1.00	30	157.2	55.1
J1686	1.00	30	157.3	55.2
J708	1.00	32	159.3	55.2
J1244	1.00	38	165.4	55.2
J1688	1.00	28	155.4	55.2
J690	1.00	28	155.4	55.2
J682	1.00	28	155.4	55.2
J532	1.00	27	154.4	55.2
J650	1.00	28	155.4	55.2
J676	1.00	28	155.5	55.2
J780	1.00	25	152.5	55.2
J778	1.00	25	152.5	55.2
J534	1.00	27	154.5	55.2
J518	1.00	27	154.6	55.3
J640	1.00	28	155.7	55.3
J564	1.00	27	154.8	55.4
J1432	1.00	31	158.9	55.4
J1544	1.00	27	155.0	55.5
J1400	1.00	32	160.0	55.5
J802	1.00	30	158.1	55.5
J1396	1.00	32	160.1	55.5
J618	1.00	27	155.1	55.5
J620	1.00	27	155.2	55.5
J522	1.00	26	154.2	55.6
J1370	1.00	32	160.2	55.6
J1376	1.00	32	160.3	55.6
J658	1.00	27	155.3	55.6
J656	1.00	27	155.3	55.6
J672	1.00	27	155.4	55.6
J610	1.00	25	153.4	55.6
J1654	1.00	27	155.4	55.6
J1656	1.00	27	155.4	55.6
J1690	1.00	27	155.4	55.6
J1242	1.00	37	165.4	55.7
J638	1.00	27	155.5	55.7
J834	1.00	24	152.5	55.7
J1304	1.00	34	162.5	55.7
J714	1.00	30	158.5	55.7
J1278	1.00	35	163.6	55.7
J1360	1.00	32	160.6	55.7
J1566	1.00	29	157.7	55.8
J578	1.00	26	154.8	55.8
J562	1.00	26	154.8	55.8
J1470	1.00	30	159.0	55.9
J1632	1.00	29	158.1	55.9

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J1526	1.00	29	158.1	55.9
J1514	1.00	29	158.1	55.9
J1300	1.00	33	162.1	55.9
J1500	1.00	29	158.2	56.0
J1414	1.00	30	159.2	56.0
J1462	1.00	30	159.2	56.0
J694	1.00	28	157.3	56.0
J1660	1.00	28	157.3	56.0
J1496	1.00	29	158.3	56.0
J696	1.00	30	159.3	56.0
J612	1.00	24	153.4	56.1
J594	1.00	26	155.4	56.1
J1458	1.00	30	159.4	56.1
J1248	1.00	36	165.4	56.1
J652	1.00	26	155.4	56.1
J554	1.00	25	154.5	56.1
J552	1.00	25	154.5	56.1
J1296	1.00	33	162.5	56.1
J1454	1.00	30	159.6	56.1
J1258	1.00	35	164.6	56.2
J504	1.00	25	154.6	56.2
J1254	1.00	35	164.6	56.2
J1116	1.00	37	166.7	56.2
J608	1.00	24	153.7	56.2
J1442	1.00	29	158.7	56.2
J1440	1.00	29	158.8	56.2
J1438	1.00	29	158.8	56.2
J1410	1.00	30	159.8	56.2
J1434	1.00	29	158.8	56.3
J1474	1.00	29	158.9	56.3
J596	1.00	26	155.9	56.3
J1292	1.00	33	162.9	56.3
J1430	1.00	29	158.9	56.3
J1406	1.00	30	159.9	56.3
J1426	1.00	29	158.9	56.3
J1266	1.00	34	164.0	56.3
J1422	1.00	29	159.0	56.3
J1524	1.00	28	158.1	56.4
J1634	1.00	28	158.1	56.4
J1520	1.00	28	158.1	56.4
J1510	1.00	28	158.1	56.4
J1506	1.00	28	158.1	56.4
J764	1.00	26	156.1	56.4
J758	1.00	26	156.1	56.4
J1502	1.00	28	158.2	56.4
J1262	1.00	34	164.2	56.4
J1504	1.00	28	158.2	56.4
J1288	1.00	33	163.2	56.4
J1498	1.00	28	158.2	56.4
J1384	1.00	30	160.3	56.5
J660	1.00	25	155.3	56.5
J706	1.00	29	159.3	56.5
J704	1.00	29	159.3	56.5

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J702	1.00	29	159.3	56.5
J1636	1.00	28	158.3	56.5
J698	1.00	29	159.3	56.5
J1492	1.00	28	158.3	56.5
J1340	1.00	31	161.3	56.5
J1684	1.00	29	159.3	56.5
J1626	1.00	30	160.4	56.5
J1366	1.00	30	160.4	56.5
J670	1.00	25	155.4	56.5
J1628	1.00	30	160.4	56.5
J1364	1.00	30	160.4	56.5
J1306	1.00	32	162.5	56.5
J1490	1.00	28	158.5	56.6
J1302	1.00	32	162.5	56.6
J1638	1.00	28	158.5	56.6
J1488	1.00	28	158.5	56.6
J1486	1.00	28	158.5	56.6
J506	1.00	24	154.6	56.6
J642	1.00	25	155.7	56.6
J604	1.00	23	153.7	56.6
J1446	1.00	28	158.7	56.6
J1450	1.00	28	158.7	56.6
J1444	1.00	28	158.7	56.6
J1270	1.00	33	163.8	56.7
J740	1.00	27	157.8	56.7
J1404	1.00	29	159.9	56.7
J1424	1.00	28	159.0	56.8
J1348	1.00	30	161.0	56.8
J1530	1.00	27	158.1	56.8
J1528	1.00	27	158.1	56.8
J1522	1.00	27	158.1	56.8
J1516	1.00	27	158.1	56.8
J1508	1.00	27	158.1	56.8
J1250	1.00	34	165.1	56.8
J1344	1.00	30	161.1	56.8
J1418	1.00	28	159.2	56.8
J1416	1.00	28	159.2	56.8
J1374	1.00	29	160.3	56.9
J1494	1.00	27	158.3	56.9
J700	1.00	28	159.4	56.9
J1368	1.00	29	160.4	56.9
J1236	1.00	34	165.4	57.0
J1336	1.00	30	161.6	57.0
J1316	1.00	30	161.7	57.0
J1118	1.00	34	165.7	57.1
J1354	1.00	29	160.8	57.1
J1436	1.00	27	158.8	57.1
J1356	1.00	29	160.9	57.1
J1466	1.00	27	159.1	57.2
J1420	1.00	27	159.2	57.3
J1394	1.00	28	160.3	57.3
J1392	1.00	28	160.3	57.3
J1388	1.00	28	160.3	57.3

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J1630	1.00	28	160.3	57.3
J1390	1.00	28	160.3	57.3
J1386	1.00	28	160.3	57.3
J1382	1.00	28	160.3	57.3
J1380	1.00	28	160.3	57.3
J1378	1.00	28	160.3	57.3
J1362	1.00	28	160.6	57.4
J1330	1.00	29	161.6	57.4
J1624	1.00	28	160.6	57.5
J1322	1.00	29	161.6	57.5
J1276	1.00	31	163.6	57.5
J1328	1.00	29	161.6	57.5
J1358	1.00	28	160.6	57.5
J1568	1.00	25	157.7	57.5
J1448	1.00	26	158.7	57.5
J1114	1.00	34	166.7	57.5
J1478	1.00	26	158.8	57.5
J1480	1.00	26	158.8	57.5
J1476	1.00	26	158.8	57.5
J1622	1.00	28	160.8	57.6
J1408	1.00	27	159.8	57.6
J1352	1.00	28	160.9	57.6
J1472	1.00	26	158.9	57.6
J1428	1.00	26	158.9	57.6
J1468	1.00	26	159.0	57.6
J1402	1.00	27	160.0	57.6
J1512	1.00	25	158.1	57.7
J1464	1.00	26	159.1	57.7
J1398	1.00	27	160.1	57.7
J1460	1.00	26	159.3	57.7
J1456	1.00	26	159.4	57.8
J1708	1.00	26	159.4	57.8
J1308	1.00	29	162.5	57.9
J1294	1.00	29	162.5	57.9
J1334	1.00	28	161.6	57.9
J1640	1.00	33	166.6	57.9
J1642	1.00	33	166.6	57.9
J1452	1.00	26	159.6	57.9
J1320	1.00	28	161.6	57.9
J1338	1.00	28	161.6	57.9
J1564	1.00	24	157.7	57.9
J1412	1.00	26	159.7	58.0
J1290	1.00	29	162.9	58.0
J1670	1.00	27	160.9	58.0
J1268	1.00	30	164.0	58.1
J1298	1.00	28	162.1	58.1
J1264	1.00	30	164.2	58.1
J1372	1.00	26	160.2	58.2
J1110	1.00	33	167.3	58.2
J1108	1.00	33	167.4	58.2
J1240	1.00	31	165.4	58.2
J1238	1.00	31	165.4	58.3
J832	1.00	18	152.5	58.3

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J1312	1.00	28	162.5	58.3
J828	1.00	18	152.5	58.3
J826	1.00	18	152.5	58.3
J1324	1.00	27	161.6	58.3
J1318	1.00	27	161.7	58.3
J1314	1.00	27	161.7	58.4
J1274	1.00	29	163.7	58.4
J1484	1.00	24	158.8	58.4
J1482	1.00	24	158.8	58.4
J1350	1.00	26	161.0	58.5
J1252	1.00	30	165.1	58.5
J1286	1.00	28	163.2	58.6
J1284	1.00	28	163.3	58.6
J1106	1.00	32	167.4	58.7
J1310	1.00	27	162.5	58.7
J1618	1.00	26	161.6	58.7
J1620	1.00	26	161.6	58.7
J1260	1.00	29	164.6	58.7
J1326	1.00	26	161.6	58.7
J1256	1.00	29	164.6	58.8
J1570	1.00	22	157.8	58.8
J1272	1.00	28	163.8	58.8
J810	1.00	22	158.0	58.9
J1574	1.00	22	158.0	58.9
J1704	1.00	22	158.0	58.9
J798	1.00	22	158.0	58.9
J804	1.00	22	158.1	59.0
J1112	1.00	31	167.3	59.1
J1234	1.00	30	166.6	59.2
J1230	1.00	30	166.6	59.2
J1562	1.00	21	157.9	59.3
J796	1.00	21	158.1	59.4
J794	1.00	21	158.1	59.4
J1232	1.00	29	166.5	59.6
J1332	1.00	24	161.6	59.6
J1120	1.00	28	165.7	59.7
J1572	1.00	20	157.7	59.7
J1560	1.00	20	157.8	59.7
J808	1.00	20	158.1	59.8
J1706	1.00	20	158.1	59.8
J806	1.00	20	158.1	59.8
J818	1.00	19	158.1	60.3
J816	1.00	19	158.1	60.3
J814	1.00	19	158.1	60.3
J812	1.00	19	158.1	60.3
J1598	1.00	18	157.6	60.5
J1596	1.00	18	157.6	60.5
J1594	1.00	18	157.6	60.5
J1552	1.00	18	157.6	60.5
J1554	1.00	18	157.7	60.5
J1556	1.00	18	157.7	60.5
J824	1.00	18	158.0	60.7
J822	1.00	18	158.0	60.7

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J820	1.00	18	158.0	60.7
J1558	1.00	17	157.8	61.0
J1696	1.00	0	153.1	66.3

Scenario: 2035 Available Residential Fire Flow
Sorted from lowest to highest fire flow

ID	Static Demand (gpm)	Static Pressure (psi)	Fire-Flow Demand (gpm)	Design Flow (gpm)
J1482	0.58	187.75	750	559
J1480	0.58	186.88	750	574
FH-1	0.58	96.92	750	595
J16	0.58	95.18	750	596
FH-2	0.58	94.76	750	676
J710	0.58	97.41	750	681
J144	0.58	96.52	750	713
J692	0.58	98.67	750	756
J1670	0.58	186.78	750	765
J162	0.58	95.27	750	768
J688	0.58	99.53	750	768
J1690	0.58	101.27	750	768
J1158	0.58	97.89	750	779
J242	0.58	98	750	784
J1692	0.58	100.4	750	786
J1688	0.58	100.83	750	818
J190	0.58	95.31	750	823
J192	0.58	98.78	750	823
J194	0.58	98.78	750	823
J362	0.58	100.29	750	855
J268	0.58	95.88	750	902
J1676	0.58	101.15	750	906
J1716	0.00	96.04	750	914
J1694	0.58	96.15	750	915
J1672	0.58	97.39	750	926
J952	0.58	98.27	750	928
J328	0.58	97.41	750	936
J502	0.58	98.27	750	995
J1658	0.58	99.97	750	1,011
J1674	0.58	96.17	750	1,025
J1706	0.58	104.35	750	1,128
J326	0.58	100.45	750	1,246
J518	0.58	101.31	750	1,410
J814	0.58	104.78	750	1,456
J446	0.58	99.94	750	1,501
J1678	0.58	99.69	750	1,554
J1684	0.58	100.44	750	1,813
J794	0.58	103.91	750	2,052
J1704	0.58	103.48	750	2,178
J1702	0.58	98.31	750	2,284
J724	0.58	97	750	2,293
J1700	0.58	100.04	750	2,385
J1686	0.58	100.01	750	2,678
J426	0.58	100.61	750	2,878
J472	0.58	100.2	750	2,934
J1680	0.58	99.78	750	3,038
J1682	0.58	98.72	750	3,112
J450	0.58	101.53	750	3,135
J1698	0.58	100.30	750	3,473
J792	0.58	100.35	750	3,612
J1708	0.58	101.74	750	3,765

Reservoir	Level
North Wellfield	37.28
South Wellfield	32.63

Applicable Fire Storage Requirement

750 gpm for 60 minutes

Booster Pump	Capacity (gpm)	Status
NWF N-1	109	ON
NWF N-2	120	ON
NWF N-3	280	ON
NWF N-4	500	ON
NWF N-5	500	OFF
NWF N-6	120	ON
NWF N-7	120	ON
NWF N-8	120	ON
SWF S-1	175	ON
SWF S-2	175	ON
SWF S-3	750	ON
SWF S-4	750	ON

System Improvements

Project D-1: A booster pump station serving Birch Place, south of 227th Street

Unrestrict the South Wellfield Booster Pump Station Discharge

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J30	0.99	31	121.1	39.0
J1050	0.99	40	130.1	39.0
J914	0.99	51	141.9	39.4
J38	0.99	30	121.0	39.4
J36	0.99	30	121.0	39.4
J32	0.99	30	121.0	39.4
J28	0.99	29	121.2	40.0
J26	0.99	29	121.3	40.0
J18	0.99	35	128.4	40.5
J1154	0.99	35	128.7	40.6
J1098	0.99	35	128.7	40.6
J1534	0.99	27	121.0	40.8
J58	0.99	34	128.4	40.9
J96	0.99	34	128.5	40.9
J98	0.99	34	128.5	40.9
J100	0.99	34	128.5	40.9
FH-2	0.99	34	128.5	40.9
J104	0.99	34	128.5	41.0
J132	0.99	34	128.5	41.0
J1058	0.99	35	129.7	41.0
J262	0.99	35	130.0	41.2
J260	0.99	35	130.0	41.2
J258	0.99	35	130.0	41.2
J54	0.99	33	128.1	41.2
J1048	0.99	35	130.1	41.2
J40	0.99	26	121.2	41.2
J1070	0.99	34	129.4	41.3
J76	0.99	33	128.4	41.4
J16	0.99	33	128.4	41.4
J74	0.99	33	128.4	41.4
J78	0.99	33	128.4	41.4
J80	0.99	33	128.5	41.4
J84	0.99	33	128.5	41.4
J88	0.99	33	128.5	41.4
J90	0.99	33	128.5	41.4
J1064	0.99	34	129.5	41.4
J1060	0.99	34	129.7	41.4
J1148	0.99	33	128.7	41.5
J152	0.99	33	128.9	41.5
J156	0.99	33	128.9	41.5
J162	0.99	33	128.9	41.6
J160	0.99	33	128.9	41.6
J166	0.99	33	129.0	41.6
J170	0.99	33	129.0	41.6
J52	0.99	32	128.1	41.6
J174	0.99	33	129.1	41.7
J180	0.99	33	129.2	41.7
J178	0.99	33	129.2	41.7
J182	0.99	33	129.2	41.7
J186	0.99	33	129.2	41.7
J190	0.99	33	129.2	41.7
J1532	0.99	25	121.2	41.7
J56	0.99	32	128.3	41.7

Reservoir	Level
North Wellfield	40.0
South Wellfield	35.0

Applicable Fire Storage Requirement

Not Applicable

Booster Pump	Capacity (gpm)	Status
NWF N-1	109	ON
NWF N-2	120	ON
NWF N-3	280	ON
NWF N-4	500	OFF
NWF N-5	500	OFF
NWF N-6	120	ON
NWF N-7	120	ON
NWF N-8	120	ON
SWF S-1	175	ON
SWF S-2	175	ON
SWF S-3	750	OFF
SWF S-4	750	OFF

System Improvements

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J204	0.99	33	129.3	41.7
J208	0.99	33	129.3	41.7
J212	0.99	33	129.3	41.7
J60	0.99	32	128.4	41.8
J218	0.99	33	129.4	41.8
J216	0.99	33	129.4	41.8
J14	0.99	32	128.4	41.8
J220	0.99	33	129.5	41.8
J1066	0.99	33	129.5	41.8
J1152	0.99	32	128.7	41.9
J274	0.99	34	130.7	41.9
J1090	0.99	32	128.8	42.0
J1054	0.99	33	129.8	42.0
J172	0.99	32	129.0	42.0
J1076	0.99	32	129.2	42.1
J196	0.99	32	129.3	42.1
J200	0.99	32	129.3	42.1
J214	0.99	32	129.4	42.2
J896	0.99	36	133.4	42.2
J10	0.99	31	128.4	42.2
J12	0.99	31	128.4	42.2
J72	0.99	31	128.4	42.2
J92	0.99	31	128.4	42.2
J70	0.99	31	128.4	42.2
J248	0.99	32	129.7	42.3
J246	0.99	32	129.7	42.3
J230	0.99	32	129.7	42.3
J228	0.99	32	129.7	42.3
J1150	0.99	31	128.7	42.3
J1156	0.99	31	128.7	42.3
J272	0.99	33	130.8	42.4
J1094	0.99	31	128.8	42.4
J1694	0.99	31	128.8	42.4
J48	0.99	30	127.8	42.4
J1088	0.99	31	128.9	42.4
J46	0.99	30	127.9	42.4
J1052	0.99	32	129.9	42.4
J44	0.99	30	127.9	42.4
J42	0.99	30	127.9	42.4
J270	0.99	32	130.0	42.5
J168	0.99	31	129.0	42.5
J256	0.99	32	130.0	42.5
J1082	0.99	31	129.0	42.5
J268	0.99	32	130.1	42.5
J266	0.99	32	130.1	42.5
J276	0.99	33	131.1	42.5
J264	0.99	32	130.1	42.5
J1078	0.99	31	129.2	42.5
J202	0.99	31	129.2	42.6
J992	0.99	35	133.3	42.6
J130	0.99	30	128.4	42.6
J958	0.99	33	131.4	42.7
J222	0.99	31	129.4	42.7

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J960	0.99	35	133.5	42.7
J224	0.99	31	129.6	42.7
J138	0.99	30	128.6	42.7
J226	0.99	31	129.6	42.7
J1606	0.99	43	141.6	42.7
J1716	0.00	32	130.6	42.7
J144	0.99	30	128.7	42.8
J142	0.99	30	128.7	42.8
J148	0.99	30	128.7	42.8
J232	0.99	31	129.8	42.8
J240	0.99	31	129.8	42.8
J50	0.99	29	127.8	42.8
J254	0.99	30	128.9	42.9
J236	0.99	30	128.9	42.9
J1228	0.99	30	128.9	42.9
J1226	0.99	30	128.9	42.9
J1224	0.99	30	128.9	42.9
J1222	0.99	30	128.9	42.9
J998	0.99	34	133.0	42.9
J1084	0.99	30	129.0	42.9
J184	0.99	30	129.1	43.0
J1542	0.99	56	155.1	43.0
J24	0.99	27	126.2	43.0
J206	0.99	30	129.2	43.0
J210	0.99	30	129.3	43.0
J1072	0.99	30	129.3	43.0
J62	0.99	29	128.4	43.1
J68	0.99	29	128.4	43.1
J1644	0.99	29	128.4	43.1
J66	0.99	29	128.4	43.1
FH-1	0.99	29	128.4	43.1
J292	0.99	32	131.5	43.1
J280	0.99	32	131.5	43.1
J1104	0.99	29	128.6	43.2
J1102	0.99	29	128.6	43.2
J924	0.99	42	141.7	43.2
J968	0.99	34	133.7	43.2
J966	0.99	34	133.7	43.2
J1144	0.99	29	128.7	43.2
J1146	0.99	29	128.7	43.2
J1132	0.99	29	128.7	43.2
J1130	0.99	29	128.7	43.2
J1128	0.99	29	128.7	43.2
J1100	0.99	29	128.7	43.2
J1126	0.99	29	128.7	43.2
J1096	0.99	29	128.7	43.2
J154	0.99	29	128.8	43.3
J164	0.99	29	128.9	43.3
J1220	0.99	29	128.9	43.3
J1216	0.99	29	128.9	43.3
J1214	0.99	29	128.9	43.3
J1124	0.99	29	129.0	43.3
J176	0.99	29	129.1	43.4

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J188	0.99	29	129.2	43.4
J34	0.99	26	126.2	43.4
J288	0.99	32	132.4	43.5
J82	0.99	28	128.4	43.5
J94	0.99	28	128.4	43.5
J126	0.99	28	128.4	43.5
J124	0.99	28	128.4	43.5
J128	0.99	28	128.4	43.5
J140	0.99	28	128.5	43.6
J1550	0.99	55	155.5	43.6
J1034	0.99	30	130.5	43.6
J686	0.99	55	155.6	43.6
J1652	0.99	55	155.6	43.6
J680	0.99	55	155.6	43.6
J146	0.99	28	128.6	43.6
J150	0.99	28	128.6	43.6
J1142	0.99	28	128.7	43.6
J1138	0.99	28	128.7	43.6
J964	0.99	33	133.8	43.7
J546	0.99	54	154.9	43.7
J234	0.99	28	128.9	43.7
J1212	0.99	28	128.9	43.7
J1210	0.99	28	128.9	43.7
J1208	0.99	28	128.9	43.7
J1206	0.99	28	128.9	43.7
J1204	0.99	28	128.9	43.7
J1202	0.99	28	128.9	43.7
J1200	0.99	28	128.9	43.7
J1198	0.99	28	129.0	43.7
J894	0.99	33	134.0	43.7
J1038	0.99	29	130.0	43.7
J1036	0.99	29	130.0	43.8
J1122	0.99	28	129.0	43.8
J1178	0.99	28	129.1	43.8
J632	0.99	54	155.1	43.8
J1030	0.99	29	130.1	43.8
J1024	0.99	29	130.2	43.9
J1190	0.99	27	128.3	43.9
J296	0.99	32	133.3	43.9
J22	0.99	25	126.4	43.9
J64	0.99	27	128.4	43.9
J102	0.99	27	128.4	43.9
J120	0.99	27	128.5	44.0
J118	0.99	27	128.5	44.0
J20	0.99	25	126.5	44.0
J974	0.99	32	133.6	44.0
J890	0.99	33	134.6	44.0
J1608	0.99	40	141.6	44.0
J1582	0.99	32	133.7	44.1
J1140	0.99	27	128.7	44.1
J1136	0.99	27	128.7	44.1
J1134	0.99	27	128.7	44.1
J1192	0.99	27	128.8	44.1

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J962	0.99	32	133.8	44.1
J1674	0.99	33	134.8	44.1
J1092	0.99	27	128.8	44.1
J238	0.99	27	128.8	44.1
J1160	0.99	27	129.0	44.2
J1158	0.99	27	129.0	44.2
J1086	0.99	27	129.0	44.2
J996	0.99	31	133.0	44.2
J994	0.99	31	133.0	44.2
J1180	0.99	27	129.0	44.2
J278	0.99	29	131.0	44.2
J1536	0.99	27	129.1	44.2
J1166	0.99	27	129.1	44.2
J1188	0.99	26	128.1	44.3
J1186	0.99	26	128.1	44.3
J1026	0.99	28	130.2	44.3
J1176	0.99	26	128.2	44.3
J1184	0.99	26	128.3	44.3
J294	0.99	31	133.3	44.3
J1174	0.99	26	128.3	44.3
J86	0.99	26	128.4	44.4
J956	0.99	29	131.4	44.4
J1672	0.99	29	131.5	44.4
J116	0.99	26	128.5	44.4
J134	0.99	26	128.5	44.4
J114	0.99	26	128.5	44.4
J286	0.99	27	129.6	44.5
J284	0.99	27	129.6	44.5
J892	0.99	32	134.6	44.5
J1610	0.99	31	133.6	44.5
J972	0.99	31	133.6	44.5
J970	0.99	31	133.6	44.5
J1182	0.99	26	128.8	44.5
J1538	0.99	26	128.8	44.5
J242	0.99	27	129.8	44.5
J880	0.99	36	138.8	44.6
J252	0.99	26	128.8	44.6
J1042	0.99	30	132.9	44.6
J1044	0.99	30	132.9	44.6
J1040	0.99	30	132.9	44.6
J1012	0.99	30	132.9	44.6
J1162	0.99	26	128.9	44.6
J1648	0.99	26	129.0	44.6
J1194	0.99	26	129.0	44.6
J1168	0.99	26	129.0	44.6
J1196	0.99	26	129.1	44.7
J888	0.99	34	137.1	44.7
J1080	0.99	26	129.1	44.7
J1028	0.99	27	130.2	44.7
J1164	0.99	26	129.2	44.7
J1646	0.99	26	129.2	44.7
J980	0.99	30	133.3	44.8
J976	0.99	30	133.3	44.8

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J1074	0.99	26	129.3	44.8
J112	0.99	25	128.5	44.8
J108	0.99	25	128.5	44.8
J136	0.99	25	128.5	44.8
J122	0.99	25	128.5	44.8
J110	0.99	25	128.5	44.8
J106	0.99	25	128.5	44.9
J1032	0.99	27	130.6	44.9
J1062	0.99	26	129.6	44.9
J244	0.99	26	129.7	44.9
J884	0.99	34	137.8	45.0
J250	0.99	25	128.8	45.0
J158	0.99	25	128.9	45.0
J1170	0.99	25	129.0	45.1
J952	0.99	27	131.0	45.1
J954	0.99	27	131.2	45.1
J630	0.99	51	155.2	45.1
J950	0.99	27	131.2	45.1
J194	0.99	25	129.2	45.2
J192	0.99	25	129.2	45.2
J198	0.99	25	129.2	45.2
J282	0.99	27	131.4	45.2
J1068	0.99	25	129.5	45.3
J870	0.99	36	140.6	45.3
J978	0.99	29	133.6	45.3
J984	0.99	29	133.8	45.4
J298	0.99	30	134.8	45.4
J1016	0.99	28	132.9	45.4
J1014	0.99	28	132.9	45.5
J1010	0.99	28	132.9	45.5
J1008	0.99	28	132.9	45.5
J316	0.99	33	138.1	45.5
J854	0.99	38	143.3	45.6
J852	0.99	38	143.3	45.6
J856	0.99	38	143.3	45.6
J948	0.99	28	133.4	45.7
J1020	0.99	27	132.5	45.7
J1022	0.99	27	132.5	45.7
J1018	0.99	27	132.5	45.7
J668	0.99	50	155.6	45.7
J666	0.99	50	155.6	45.7
J882	0.99	33	138.8	45.8
J848	0.99	39	144.8	45.9
J1056	0.99	24	129.8	45.9
J312	0.99	32	138.2	46.0
J844	0.99	39	145.3	46.0
J842	0.99	39	145.4	46.1
J1616	0.99	27	133.5	46.2
J990	0.99	27	133.5	46.2
J988	0.99	27	133.5	46.2
J1614	0.99	27	133.6	46.2
J986	0.99	27	133.7	46.2
J858	0.99	36	142.8	46.3

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J1046	0.99	26	132.9	46.3
J1006	0.99	26	133.0	46.4
J1004	0.99	26	133.1	46.4
J1002	0.99	26	133.1	46.4
J982	0.99	26	133.3	46.5
J290	0.99	25	132.3	46.5
J926	0.99	34	141.7	46.6
J886	0.99	30	137.7	46.7
J1218	0.99	21	128.9	46.8
J328	0.99	32	140.1	46.8
J1000	0.99	25	133.3	46.9
J1604	0.99	33	141.6	47.1
J304	0.99	26	134.8	47.2
J302	0.99	26	134.8	47.2
J300	0.99	26	134.8	47.2
J314	0.99	29	137.9	47.2
J318	0.99	29	138.0	47.2
J324	0.99	29	138.1	47.3
J850	0.99	35	144.7	47.6
J322	0.99	28	137.9	47.6
J846	0.99	35	145.3	47.8
J310	0.99	28	138.3	47.8
J306	0.99	27	137.9	48.1
J320	0.99	27	137.9	48.1
J348	0.99	33	144.6	48.4
J916	0.99	30	141.6	48.4
J878	0.99	25	137.0	48.5
J332	0.99	28	140.0	48.5
J330	0.99	28	140.0	48.6
J1580	0.99	30	142.1	48.6
J932	0.99	29	141.6	48.8
J934	0.99	29	141.6	48.8
J936	0.99	29	141.6	48.8
J938	0.99	29	141.6	48.8
J920	0.99	29	141.7	48.8
J918	0.99	29	141.7	48.8
J308	0.99	26	138.9	48.9
J338	0.99	30	143.1	49.0
J340	0.99	30	143.1	49.0
J336	0.99	30	143.1	49.0
J898	0.99	20	133.3	49.1
J874	0.99	27	140.4	49.1
J872	0.99	27	140.4	49.1
J386	0.99	34	147.5	49.2
J930	0.99	28	141.6	49.2
J928	0.99	28	141.6	49.2
J342	0.99	30	144.7	49.7
J788	0.99	38	152.8	49.7
J350	0.99	30	144.8	49.8
J326	0.99	25	140.1	49.9
J1576	0.99	27	142.1	49.9
J876	0.99	25	140.4	50.0
J790	0.99	37	152.7	50.1

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J352	0.99	29	144.8	50.2
J1578	0.99	26	142.1	50.3
J334	0.99	27	143.5	50.5
J922	0.99	25	141.6	50.5
J1650	0.99	28	144.7	50.6
J354	0.99	28	144.7	50.6
J356	0.99	28	144.8	50.6
J1666	0.99	36	152.8	50.6
J384	0.99	31	147.9	50.7
J800	0.99	41	158.0	50.7
J370	0.99	30	147.3	50.8
J1678	0.99	29	146.4	50.9
J394	0.99	30	147.4	50.9
J396	0.99	30	147.4	50.9
J398	0.99	30	147.4	50.9
J946	0.99	24	141.4	50.9
J420	0.99	35	152.5	50.9
J368	0.99	29	146.5	50.9
J362	0.99	27	144.7	51.0
J830	0.99	35	152.7	51.0
J358	0.99	27	144.7	51.0
J786	0.99	35	152.8	51.0
J784	0.99	35	152.8	51.0
J782	0.99	35	152.8	51.0
J372	0.99	30	148.1	51.2
J380	0.99	29	147.3	51.3
J944	0.99	23	141.4	51.3
J942	0.99	23	141.4	51.3
J1548	0.99	37	155.5	51.4
J674	0.99	37	155.6	51.4
J940	0.99	23	141.6	51.4
J1540	0.99	26	144.6	51.4
J344	0.99	26	144.7	51.4
J768	0.99	34	152.7	51.4
J770	0.99	34	152.7	51.5
J776	0.99	34	152.7	51.5
J360	0.99	26	144.8	51.5
J900	0.99	23	141.8	51.5
J374	0.99	30	148.9	51.5
J1600	0.99	30	149.0	51.6
J378	0.99	29	148.0	51.6
J1602	0.99	30	149.0	51.6
J376	0.99	29	148.3	51.7
J484	0.99	31	150.3	51.7
J392	0.99	28	147.4	51.7
J390	0.99	28	147.4	51.7
J388	0.99	28	147.5	51.8
J838	0.99	34	153.5	51.8
J346	0.99	25	144.6	51.8
J1676	0.99	25	144.7	51.9
J772	0.99	33	152.7	51.9
J606	0.99	35	154.8	51.9
J568	0.99	35	154.8	51.9

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J382	0.99	28	147.9	52.0
J402	0.99	30	150.0	52.0
J400	0.99	30	150.0	52.0
J430	0.99	32	152.0	52.0
J432	0.99	32	152.1	52.0
J480	0.99	30	150.3	52.1
J840	0.99	33	153.5	52.2
J724	0.99	37	157.6	52.3
J726	0.99	37	157.6	52.3
J364	0.99	24	144.6	52.3
J366	0.99	24	144.7	52.3
J1592	0.99	34	154.8	52.3
J502	0.99	34	154.8	52.3
J444	0.99	30	150.8	52.4
J410	0.99	30	150.8	52.4
J446	0.99	30	150.8	52.4
J448	0.99	30	150.8	52.4
J408	0.99	29	150.0	52.4
J466	0.99	29	150.0	52.4
J468	0.99	29	150.2	52.5
J434	0.99	31	152.2	52.5
J722	0.99	36	157.3	52.5
J862	0.99	21	142.3	52.6
J860	0.99	21	142.3	52.6
J464	0.99	29	150.4	52.6
J478	0.99	29	150.4	52.6
J496	0.99	33	154.6	52.7
J1680	0.99	31	152.6	52.7
J766	0.99	35	156.8	52.8
J566	0.99	33	154.9	52.8
J602	0.99	33	154.9	52.8
J404	0.99	28	150.0	52.9
J406	0.99	28	150.0	52.9
J462	0.99	29	151.0	52.9
J474	0.99	28	150.4	53.0
J460	0.99	30	152.4	53.0
J472	0.99	30	152.5	53.1
J454	0.99	30	152.5	53.1
J458	0.99	30	152.5	53.1
J692	0.99	33	155.6	53.1
J902	0.99	19	141.8	53.2
J738	0.99	35	157.8	53.2
J428	0.99	29	151.8	53.2
J736	0.99	35	157.8	53.2
J906	0.99	19	141.8	53.2
J494	0.99	31	153.8	53.2
J908	0.99	19	141.9	53.2
J912	0.99	19	141.9	53.2
J910	0.99	19	141.9	53.2
J904	0.99	19	141.9	53.2
J732	0.99	35	157.9	53.2
J728	0.99	35	157.9	53.2
J570	0.99	32	154.9	53.2

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J730	0.99	35	157.9	53.2
J572	0.99	32	154.9	53.3
J866	0.99	19	141.9	53.3
J864	0.99	19	142.0	53.3
J486	0.99	30	153.2	53.4
J1662	0.99	34	157.2	53.4
J792	0.99	30	153.2	53.4
J762	0.99	34	157.2	53.4
J1664	0.99	34	157.3	53.4
J1702	0.99	34	157.3	53.4
J482	0.99	27	150.3	53.4
J710	0.99	36	159.3	53.4
J422	0.99	29	152.3	53.4
J426	0.99	29	152.4	53.5
J424	0.99	29	152.4	53.5
J1698	0.99	30	153.5	53.5
J418	0.99	29	152.5	53.5
J416	0.99	29	152.5	53.5
J470	0.99	29	152.5	53.5
J750	0.99	30	153.7	53.6
J514	0.99	31	154.8	53.6
J760	0.99	33	156.8	53.6
J512	0.99	31	154.8	53.6
J442	0.99	27	150.8	53.7
J440	0.99	27	150.8	53.7
J530	0.99	31	154.9	53.7
J488	0.99	29	153.2	53.8
J1590	0.99	29	153.2	53.8
J712	0.99	35	159.3	53.9
J490	0.99	29	153.5	53.9
J748	0.99	29	153.5	53.9
J688	0.99	31	155.6	54.0
J648	0.99	31	155.6	54.0
J646	0.99	31	155.6	54.0
J1282	0.99	39	163.7	54.0
J548	0.99	30	154.8	54.1
J556	0.99	30	154.8	54.1
J438	0.99	26	150.8	54.1
J544	0.99	30	154.9	54.1
J540	0.99	30	154.9	54.1
J868	0.99	17	141.9	54.1
J754	0.99	29	154.1	54.2
J1682	0.99	33	158.1	54.2
J742	0.99	33	158.1	54.2
J1346	0.99	36	161.2	54.3
J622	0.99	30	155.2	54.3
J1342	0.99	36	161.4	54.4
J746	0.99	28	153.5	54.4
J1588	0.99	27	152.5	54.4
J616	0.99	30	155.5	54.4
J678	0.99	30	155.6	54.4
J664	0.99	30	155.6	54.4
J614	0.99	28	153.6	54.4

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J1658	0.99	30	155.6	54.4
J634	0.99	30	155.6	54.4
J636	0.99	30	155.6	54.4
J628	0.99	30	155.6	54.4
J626	0.99	30	155.7	54.5
J450	0.99	27	152.7	54.5
J774	0.99	27	152.7	54.5
J536	0.99	29	154.8	54.5
J508	0.99	29	154.8	54.5
J492	0.99	29	154.8	54.5
J510	0.99	29	154.8	54.5
J734	0.99	32	157.8	54.5
J1718	0.00	27	152.8	54.5
J452	0.99	27	152.8	54.5
J524	0.99	29	154.9	54.5
J582	0.99	29	154.9	54.6
J600	0.99	29	154.9	54.6
J414	0.99	24	150.0	54.6
J456	0.99	27	153.0	54.6
J1546	0.99	29	155.0	54.6
J598	0.99	29	155.0	54.6
J412	0.99	24	150.0	54.6
J756	0.99	28	154.1	54.6
J542	0.99	29	155.1	54.6
J1612	0.99	27	153.1	54.7
J720	0.99	31	157.2	54.7
J624	0.99	29	155.2	54.7
J718	0.99	31	157.3	54.7
J574	0.99	29	155.3	54.7
J716	0.99	31	157.3	54.7
J576	0.99	29	155.3	54.7
J500	0.99	27	153.3	54.7
J476	0.99	24	150.3	54.7
J584	0.99	29	155.4	54.8
J590	0.99	29	155.4	54.8
J586	0.99	29	155.4	54.8
J588	0.99	29	155.4	54.8
J498	0.99	27	153.4	54.8
J520	0.99	27	153.5	54.8
J744	0.99	27	153.5	54.8
J1246	0.99	39	165.5	54.8
J1584	0.99	26	152.5	54.8
J436	0.99	26	152.5	54.8
J592	0.99	29	155.5	54.8
J684	0.99	29	155.6	54.8
J1692	0.99	29	155.6	54.8
J662	0.99	29	155.6	54.8
J654	0.99	29	155.6	54.9
J1280	0.99	37	163.7	54.9
J752	0.99	30	156.7	54.9
J550	0.99	28	154.7	54.9
J644	0.99	29	155.8	55.0
J528	0.99	28	154.8	55.0

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J526	0.99	28	154.9	55.0
J580	0.99	28	155.0	55.0
J538	0.99	28	155.0	55.0
J558	0.99	28	155.2	55.1
J560	0.99	28	155.2	55.1
J1518	0.99	31	158.2	55.1
J1700	0.99	30	157.3	55.2
J708	0.99	32	159.3	55.2
J1686	0.99	30	157.4	55.2
J1244	0.99	38	165.5	55.2
J1586	0.99	25	152.5	55.2
J516	0.99	26	153.5	55.2
J1688	0.99	28	155.6	55.3
J690	0.99	28	155.6	55.3
J682	0.99	28	155.6	55.3
J650	0.99	28	155.6	55.3
J676	0.99	28	155.6	55.3
J532	0.99	27	154.6	55.3
J534	0.99	27	154.6	55.3
J780	0.99	25	152.7	55.4
J778	0.99	25	152.7	55.4
J518	0.99	27	154.8	55.4
J640	0.99	28	155.8	55.4
J564	0.99	27	155.0	55.5
J1432	0.99	31	159.0	55.5
J802	0.99	30	158.1	55.5
J1544	0.99	27	155.2	55.5
J1400	0.99	32	160.2	55.5
J1396	0.99	32	160.3	55.6
J618	0.99	27	155.3	55.6
J620	0.99	27	155.3	55.6
J1370	0.99	32	160.4	55.6
J522	0.99	26	154.4	55.6
J1376	0.99	32	160.4	55.7
J658	0.99	27	155.4	55.7
J656	0.99	27	155.4	55.7
J1242	0.99	37	165.5	55.7
J672	0.99	27	155.5	55.7
J714	0.99	30	158.6	55.7
J1654	0.99	27	155.6	55.7
J1656	0.99	27	155.6	55.7
J1690	0.99	27	155.6	55.7
J610	0.99	25	153.6	55.7
J638	0.99	27	155.6	55.7
J1304	0.99	34	162.6	55.7
J1278	0.99	35	163.7	55.8
J1360	0.99	32	160.7	55.8
J834	0.99	24	152.8	55.8
J1566	0.99	29	157.8	55.8
J578	0.99	26	155.0	55.9
J562	0.99	26	155.0	55.9
J1470	0.99	30	159.1	56.0
J1300	0.99	33	162.2	56.0

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J1632	0.99	29	158.2	56.0
J1526	0.99	29	158.2	56.0
J1514	0.99	29	158.2	56.0
J696	0.99	30	159.3	56.0
J1414	0.99	30	159.3	56.0
J1500	0.99	29	158.4	56.1
J694	0.99	28	157.4	56.1
J1660	0.99	28	157.4	56.1
J1462	0.99	30	159.4	56.1
J1248	0.99	36	165.4	56.1
J1496	0.99	29	158.5	56.1
J594	0.99	26	155.5	56.1
J1458	0.99	30	159.5	56.1
J612	0.99	24	153.5	56.1
J652	0.99	26	155.6	56.1
J1296	0.99	33	162.6	56.2
J554	0.99	25	154.6	56.2
J1258	0.99	35	164.6	56.2
J552	0.99	25	154.6	56.2
J1254	0.99	35	164.7	56.2
J1454	0.99	30	159.7	56.2
J1116	0.99	37	166.7	56.2
J504	0.99	25	154.8	56.2
J608	0.99	24	153.9	56.3
J1442	0.99	29	158.9	56.3
J1440	0.99	29	158.9	56.3
J1292	0.99	33	162.9	56.3
J1410	0.99	30	159.9	56.3
J1438	0.99	29	158.9	56.3
J596	0.99	26	156.0	56.3
J1434	0.99	29	159.0	56.3
J1474	0.99	29	159.0	56.3
J1430	0.99	29	159.0	56.3
J1406	0.99	30	160.1	56.4
J1426	0.99	29	159.1	56.4
J1266	0.99	34	164.1	56.4
J1422	0.99	29	159.2	56.4
J1524	0.99	28	158.2	56.4
J764	0.99	26	156.2	56.4
J1262	0.99	34	164.2	56.4
J1634	0.99	28	158.2	56.4
J1520	0.99	28	158.2	56.4
J758	0.99	26	156.3	56.4
J1510	0.99	28	158.3	56.4
J1288	0.99	33	163.3	56.4
J1506	0.99	28	158.3	56.5
J706	0.99	29	159.3	56.5
J704	0.99	29	159.3	56.5
J702	0.99	29	159.3	56.5
J698	0.99	29	159.3	56.5
J1502	0.99	28	158.3	56.5
J1684	0.99	29	159.4	56.5
J1504	0.99	28	158.4	56.5

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J1498	0.99	28	158.4	56.5
J1384	0.99	30	160.4	56.5
J660	0.99	25	155.4	56.5
J1340	0.99	31	161.5	56.5
J1636	0.99	28	158.5	56.5
J1492	0.99	28	158.5	56.6
J1626	0.99	30	160.5	56.6
J1366	0.99	30	160.5	56.6
J670	0.99	25	155.6	56.6
J1628	0.99	30	160.6	56.6
J1364	0.99	30	160.6	56.6
J1306	0.99	32	162.6	56.6
J1302	0.99	32	162.6	56.6
J1490	0.99	28	158.7	56.6
J1638	0.99	28	158.7	56.6
J1488	0.99	28	158.7	56.6
J1486	0.99	28	158.7	56.6
J506	0.99	24	154.8	56.7
J642	0.99	25	155.8	56.7
J1270	0.99	33	163.8	56.7
J740	0.99	27	157.9	56.7
J1446	0.99	28	158.9	56.7
J1450	0.99	28	158.9	56.7
J604	0.99	23	153.9	56.7
J1444	0.99	28	158.9	56.7
J1404	0.99	29	160.1	56.8
J1250	0.99	34	165.1	56.8
J1348	0.99	30	161.2	56.8
J1424	0.99	28	159.2	56.8
J1530	0.99	27	158.2	56.9
J1528	0.99	27	158.2	56.9
J1344	0.99	30	161.2	56.9
J1522	0.99	27	158.2	56.9
J1516	0.99	27	158.2	56.9
J1508	0.99	27	158.3	56.9
J1418	0.99	28	159.3	56.9
J1416	0.99	28	159.3	56.9
J700	0.99	28	159.4	56.9
J1374	0.99	29	160.4	57.0
J1236	0.99	34	165.5	57.0
J1494	0.99	27	158.5	57.0
J1368	0.99	29	160.5	57.0
J1336	0.99	30	161.7	57.1
J1118	0.99	34	165.7	57.1
J1316	0.99	30	161.8	57.1
J1354	0.99	29	160.9	57.2
J1436	0.99	27	159.0	57.2
J1356	0.99	29	161.0	57.2
J1466	0.99	27	159.2	57.3
J1420	0.99	27	159.3	57.3
J1394	0.99	28	160.4	57.4
J1392	0.99	28	160.4	57.4
J1388	0.99	28	160.4	57.4

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J1630	0.99	28	160.4	57.4
J1390	0.99	28	160.4	57.4
J1386	0.99	28	160.4	57.4
J1382	0.99	28	160.4	57.4
J1380	0.99	28	160.4	57.4
J1378	0.99	28	160.4	57.4
J1276	0.99	31	163.7	57.5
J1330	0.99	29	161.7	57.5
J1362	0.99	28	160.7	57.5
J1322	0.99	29	161.7	57.5
J1624	0.99	28	160.7	57.5
J1328	0.99	29	161.7	57.5
J1358	0.99	28	160.7	57.5
J1114	0.99	34	166.8	57.5
J1568	0.99	25	157.8	57.5
J1448	0.99	26	158.9	57.6
J1478	0.99	26	158.9	57.6
J1622	0.99	28	160.9	57.6
J1408	0.99	27	160.0	57.6
J1480	0.99	26	159.0	57.6
J1476	0.99	26	159.0	57.6
J1352	0.99	28	161.0	57.6
J1472	0.99	26	159.0	57.6
J1428	0.99	26	159.1	57.7
J1468	0.99	26	159.1	57.7
J1402	0.99	27	160.2	57.7
J1398	0.99	27	160.3	57.7
J1464	0.99	26	159.3	57.7
J1512	0.99	25	158.3	57.7
J1460	0.99	26	159.4	57.8
J1708	0.99	26	159.4	57.8
J1456	0.99	26	159.5	57.9
J1640	0.99	33	166.6	57.9
J1642	0.99	33	166.6	57.9
J1308	0.99	29	162.6	57.9
J1294	0.99	29	162.6	57.9
J1334	0.99	28	161.7	57.9
J1452	0.99	26	159.7	57.9
J1320	0.99	28	161.7	57.9
J1338	0.99	28	161.7	58.0
J1564	0.99	24	157.8	58.0
J1412	0.99	26	159.9	58.0
J1290	0.99	29	163.0	58.0
J1670	0.99	27	161.0	58.1
J1268	0.99	30	164.1	58.1
J1298	0.99	28	162.2	58.2
J1264	0.99	30	164.2	58.2
J1110	0.99	33	167.3	58.2
J1372	0.99	26	160.4	58.2
J1108	0.99	33	167.4	58.2
J1240	0.99	31	165.5	58.3
J1238	0.99	31	165.5	58.3
J1312	0.99	28	162.6	58.3

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J1324	0.99	27	161.7	58.4
J832	0.99	18	152.7	58.4
J1318	0.99	27	161.8	58.4
J828	0.99	18	152.8	58.4
J826	0.99	18	152.8	58.4
J1314	0.99	27	161.8	58.4
J1274	0.99	29	163.8	58.4
J1484	0.99	24	158.9	58.5
J1482	0.99	24	159.0	58.5
J1252	0.99	30	165.1	58.6
J1350	0.99	26	161.2	58.6
J1286	0.99	28	163.3	58.6
J1284	0.99	28	163.4	58.7
J1106	0.99	32	167.4	58.7
J1310	0.99	27	162.6	58.8
J1260	0.99	29	164.6	58.8
J1618	0.99	26	161.7	58.8
J1256	0.99	29	164.7	58.8
J1620	0.99	26	161.7	58.8
J1326	0.99	26	161.7	58.8
J1570	0.99	22	157.8	58.9
J1272	0.99	28	163.8	58.9
J810	0.99	22	158.1	59.0
J1574	0.99	22	158.1	59.0
J1704	0.99	22	158.1	59.0
J798	0.99	22	158.1	59.0
J804	0.99	22	158.1	59.0
J1112	0.99	31	167.3	59.1
J1234	0.99	30	166.6	59.2
J1230	0.99	30	166.6	59.2
J1562	0.99	21	157.9	59.3
J796	0.99	21	158.1	59.4
J794	0.99	21	158.1	59.4
J1232	0.99	29	166.6	59.6
J1332	0.99	24	161.7	59.7
J1120	0.99	28	165.7	59.7
J1572	0.99	20	157.8	59.7
J1560	0.99	20	157.8	59.7
J808	0.99	20	158.1	59.8
J1706	0.99	20	158.1	59.8
J806	0.99	20	158.1	59.8
J818	0.99	19	158.1	60.3
J816	0.99	19	158.1	60.3
J814	0.99	19	158.1	60.3
J812	0.99	19	158.1	60.3
J1598	0.99	18	157.7	60.5
J1596	0.99	18	157.7	60.5
J1594	0.99	18	157.7	60.5
J1552	0.99	18	157.7	60.5
J1554	0.99	18	157.7	60.5
J1556	0.99	18	157.8	60.6
J824	0.99	18	158.0	60.7
J822	0.99	18	158.0	60.7

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J820	0.99	18	158.1	60.7
J1558	0.99	17	157.8	61.0
J1696	0.99	0	153.4	66.5

APPENDIX G

WATER QUALITY MONITORING REQUIREMENTS AND MONITORING PLANS

Water Quality Monitoring Schedule

System: NORTH BEACH WATER
Contact: William (Bill) M Neal III

PWS ID: 63000 C
Group: A - Comm

Region: SOUTHWEST
County: PACIFIC

NOTE: To receive credit for compliance samples, you must fill out laboratory and sample paperwork completely, send your samples to a laboratory accredited by Washington State to conduct the analyses, AND ensure the results are submitted to DOH Office of Drinking Water. There is often a lag time between when you collect your sample, when we credit your system with meeting the monitoring requirement, and when we generate the new monitoring requirement.

Coliform Monitoring Requirements

	Jul 2014	Aug 2014	Sep 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015
Coliform Monitoring Population	7636	7646	8093	6792	5823	6319	5232	5284	5741	6790	7229	7847
Number of Routine Samples Required	9*	9	9	8	7	7	6	6	6	8	8	9

*Indicates the requirement is an exception from WAC 246-290.

- Collect samples from representative points throughout the distribution system.
- Collect required repeat samples following an unsatisfactory sample. In addition, collect a sample from each operating groundwater source.
- Collect no less than 5 routine samples in the month following one or more unsatisfactory samples, in accordance with your system's Coliform Monitoring Plan.
- For systems that chlorinate, record chlorine residual (measured when the coliform sample is collected) on the coliform lab slip.

Chemical Monitoring Requirements

Distribution Monitoring

Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*
Lead and Copper	20	Jan 2012 - Dec 2014	standard - 3 year	09/28/2011	***Sep 2014***
Asbestos	1	Jan 2011 - Dec 2019	standard - 9 year	09/15/2010	Sep 2019
Total Trihalomethane (THM)	2	Jan 2014 - Dec 2014	Initial - Annually	08/17/2010	***Aug 2014***
Halo-Acetic Acids (HAA5)	2	Jan 2014 - Dec 2014	Initial - Annually	08/17/2010	***Aug 2014***

Notes on Distribution System Chemical Monitoring

For *Lead and Copper*:
- Collect samples from indoor faucets after the water has sat unused in the pipes for at least 6 hours, but no more than 12 hours.
- Flush sample faucets with cold water the evening prior to collecting the sample.
- If your sampling frequency is annual or once every 3 years, collect samples between June 1 and September 30.

For *Asbestos:* Collect the sample from one of your routine coliform sampling sites in an area of your distribution system that has asbestos concrete pipe.
Asbestos:

For *Disinfection Byproducts (HAA5 and THM):* Collect the samples at the locations identified in your Disinfection Byproducts (DBP) monitoring plan.

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels or analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- If "R&C" is listed in a monitoring requirement's frequency, the requirements are based on detections which are reliably and consistently below the health standard.

*Source S06** *NORTH WF (SO1,2,3,4,5 & 7,8 & 9)* *Well Field* *Use - Permanent* *Susceptility - High*

Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*
Nitrate	1	Jan 2014 - Dec 2014	standard - 1 year	05/21/2014	
Complete Inorganic (IOC)	1	Jan 2011 - Dec 2019	waiver - 9 year	04/18/2012	
Volatile Organics (VOC)	1	Jan 2014 - Dec 2019	waiver - 6 year	10/05/2010	Oct 2016
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	06/15/2009	Jun 2018
Pesticides	0	Jan 2014 - Dec 2016	waiver - 3 year	06/15/2009	
Soil Fumigants	0	Jan 2014 - Dec 2016	waiver - 3 year		
Gross alpha	1	Jan 2014 - Dec 2019	standard - 6 year	05/17/2010	May 2016
Radium 228	1	Jan 2014 - Dec 2019	standard - 6 year	05/17/2010	May 2016

*Source S10** *SOUTH WELL #1 20051/PWC S01 AGP154* *Well* *Use - Permanent* *Susceptility - High*

Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*
Nitrate	1	Jan 2014 - Dec 2014	standard - 1 year	06/26/2012	***May 2014***
Complete Inorganic (IOC)	1	Jan 2014 - Dec 2016	standard - 3 year	07/21/2010	Mar 2015
Volatile Organics (VOC)	1	Jan 2014 - Dec 2019	waiver - 6 year	06/15/2009	Jun 2015
Herbicides	1	Jan 2014 - Dec 2016	waiver - 3 year	01/08/2002	Jun 2015
Pesticides	0	Jan 2014 - Dec 2016	waiver - 3 year	01/08/2002	
Soil Fumigants	0	Jan 2014 - Dec 2016	waiver - 3 year		

*Source S10**	*SOUTH WELL #1 20051/PWC S01 AGP154*	*Well*	*Use - Permanent*	*Susceptility - High*	
Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*
Radium 228	1	Jan 2014 - Dec 2019	standard - 6 year	10/26/2009	Jun 2015

*Source S11**	*SOUTH WELL #2 20051/PWC S02 AGP155*	*Well*	*Use - Permanent*	*Susceptility - Moderate*	
Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*
Nitrate	1	Jan 2014 - Dec 2014	standard - 1 year	12/12/2013	***May 2014***
Complete Inorganic (IOC)	1	Jan 2011 - Dec 2019	waiver - 9 year	04/19/2010	Apr 2019
Volatile Organics (VOC)	1	Jan 2014 - Dec 2019	waiver - 6 year	06/15/2009	Jun 2015
Herbicides	1	Jan 2014 - Dec 2016	standard - 3 year	01/08/2002	Jun 2015
Herbicides	1	Jan 2014 - Dec 2016	standard - 3 year	01/08/2002	Jul 2016
Pesticides	0	Jan 2014 - Dec 2016	waiver - 3 year	01/08/2002	
Soil Fumigants	0	Jan 2014 - Dec 2016	waiver - 3 year		
Gross alpha	1	Jan 2014 - Dec 2019	standard - 6 year	04/20/2009	Apr 2015
Radium 228	1	Jan 2014 - Dec 2019	standard - 6 year	12/17/2012	Apr 2015

* Because this source is treated with ozone, you must monitor for bromate at entry to distribution at the frequency listed in your DBP Monitoring

Other Information

Other Reporting Schedules	Due Date
Submit Consumer Confidence Report (CCR) to customers and ODW (Community systems only):	07/01/2014
Submit CCR certification form to ODW (Community systems only):	10/01/2014
Submit Water Use Efficiency report online to ODW (Community and other municipal water systems only):	07/01/2014
Send notices of lead and copper sample results to the customers sampled:	30 days after you receive the laboratory results
Submit Certification of customer notification of lead and copper results to ODW:	90 days after end of monitoring period

Special Notes

None

Southwest Regional Water Quality Monitoring Contacts

For questions regarding chemical monitoring:	Sophia Petro: (360) 236-3046 or sophia.petro@doh.wa.gov
For questions regarding DBPs:	Regina Grimm, p.e.: (360) 236-3035 or regina.grimm@doh.wa.gov
For questions regarding coliform bacteria and microbial issues:	Sandy Brentlinger: (360) 236-3044 or sandy.brentlinger@doh.wa.gov

Additional Notes

The information on this monitoring schedule is valid as of the date in the upper left corner on the first page. However, the information may change with subsequent updates in our water quality monitoring database as we receive new data or revise monitoring schedules. There is often a lag time between when you collect your sample and when we credit your system with meeting the monitoring requirement.

We have not designed this monitoring schedule to display all compliance requirements. The purpose of this schedule is to assist water systems with planning for most water quality monitoring, and to allow systems to compare their records with DOH ODW records. Please be aware that this monitoring schedule does not include constituents that require a special monitoring frequency, such as monitoring affiliated with treatment.

Any inaccuracies on this schedule will not relieve the water system owner and operator of the requirement to comply with applicable regulations.

If you have any questions about your monitoring requirements, please contact the regional office staff listed above.

NORTH BEACH WATER DISTRICT
COLIFORM MONITORING PLAN
Plan Date: February 26, 2015

A. System Information

Water System Name: North Beach Water		**County:** Pacific		**System I.D. Number:** 63000C	
Name of Plan Preparer: Karl Johnson, P.E.		**Position:** Engineer		**Daytime Phone:** (360) 292-7481	
Sources: DOH Source Number, Source Name, Well Depth, Pumping Capacity	**DOH Source ID No.**	**Source Name**	**Depth, feet**	**Capacity, gpm)**	
	S-01	N-1	80	100	
	S-02	N-2	122	100	
	S-03	N-3	124	90	
	S-04	N-4	120	135	
	S-05	N-5	124	135	
	S-07	N-6	130	110	
	S-08	N-7	120	65	
	S-09	N-8	130	90	
	S-10	S-1	56	30	
	S-11	S-2	100	60	
	S-12	S-4	121	80	
Storage: List and Describe	Reservoir ID	Reservoir Dimensions	Nominal Capacity, gallons		
	North 1	26' Dia x 45' Ht	179,000		
	North 2	26' Dia x 45' Ht	179,000		
	North 3	26' Dia x 45' Ht	179,000		
	South	30' Dia x 50' Ht	211,000		
Treatment: Source Number & Process	All Sources: Oxidation and Filtration for Iron and Manganese Removal				
Pressure Zones: Number and name	All One Pressure Zone				
Population by Pressure Zone	Total Estimated Population: 4,010				

Number of Routine Samples Required Monthly by Regulation:								**Number of Sample Sites Available to Represent the Distribution System: 20**
Jan	6	Apr	8	Jul	9	Oct	8	
Feb	6	May	8	Aug	9	Nov	7	
Mar	6	Jun	9	Sep	9	Dec	7	
***Request DOH Approval of Triggered Source Monitoring Plan?**								**Yes** ☐ **No** ☒

*If approval is requested a fee will be charged for the review.

B. Laboratory Information

Laboratory Name: ALS Environmental - Kelso	**Office Phone:** (360) 577-7222
Address: 1317 13th Avenue South, Kelso, WA 98626	**After Hours Phone:**
Hours of Operation: Monday - Friday: 8 a.m. - 5 p.m., Saturday: 8 a.m. - 12 p.m. (noon)	
Contact Name:	
Emergency Laboratory Name: Pacific County DCD WQ Laboratory	**Office Phone: (**360) 642-9382
Address: 7013 Sandridge Rd., Long Beach, WA 98631	**After Hours Phone:**
Hours of Operation: Tuesdays between 7:30 - 11:00 am.	
Contact Name: Kristina Sieff	

C. Wholesaling of Groundwater

	Yes	No
We are a consecutive system and purchase groundwater from another water system.	☐	☒
If yes, Water System Name: _____ Contact Name: _____ Telephone Numbers: _____		
We sell groundwater to other public water systems.	☐	☒
If yes, Water System Name: _____ Contact Name: _____ Telephone Numbers: _____		
Water System Name: _____ Contact Name: _____ Telephone Numbers: _____		
Water System Name: _____ Contact Name: _____ Telephone Numbers: _____		
Water System Name: _____ Contact Name: _____ Telephone Number: _____		
Water System Name: _____ Contact Name: _____ Telephone Numbers: _____		

D. Routine, Repeat, and Triggered Source Sample Locations

Location/Address for Routine Sample Sites	Location/Address for Repeat Sample Sites
X1. (NSS #6) 3314 281st Street	**1-1.** 3409 281st St. **1-2.** 315 281st St.
X2. (NSS #7) 26200 Sandridge Rd.	**2-1.** 26215 Sandridge Rd. **2-2.** 26205 Sandridge Rd.
X3. (NSS #8) 1719 264th Pl.	**3-1.** 1707 264th Pl. **3-2.** 26300 R St.
X4. (NSS #9) 27900 O St.	**4-1.** 27811 0 St. **4-2.** 1501 279th Pl.
X5. (NSS #10) 1206 247th Pl.	**5-1.** 1202 247th Pl. **5-2.** 1208 247th Pl.
X6. (NSS #11) 24010 Birch Pl.	**6-1.** 24006 Birch Pl. **6-2.** 2704 240th Pl.
X7. (NSS #12) 23200 Birch Pl.	**7-1.** 2811 231st Ln **7-2.** 2731 232st Ln
X8. (NSS #13) 20500 Birch Pl.	**8-1.** 20503 Birch Pl. **8-2.** 20407 Crane Pl.
X9. (NSS #14) 21700 O St.	**9-1.** 21608 O St. **9-2.** 21610 O St.
X10. (NSS #15) 21401 Pacific Hwy.	**10-1.** 21403 Pacific Hwy. **10-2.** 1325 213th St.
X11. (NSS #16) 1311 197th Pl.	**11-1.** 1315 197th Pl. **11-2.** 1306 197th Pl
X12. (NSS #17) 2218 272rd St.	**12-1.** 2212 272rd St. **12-2.** 2419 272rd St.
X13. (NSS #18) 27003 Sandridge Rd.	**13-1.** 27005 Sandridge Rd. **13-2.** 3016 270th St.
X14. (NSS #19) 2807 270th St.	**14-1.** 2812 270th St. **14-2.** 2608 270th St.
X15. (NSS #20) 26500 Vernon Ave.	**15-1.** 26511 Vernon Ave. **15-2.** 26414 Vernon Ave.
X16. (NSS #21) 1711 255th Pl.	**16-1.** 1716 256th Pl. **16-2.** 1803 255th Pl.
X17. (NSS #22) 245th & Ash Pl.	**17-1.** 2709 245th St. **17-2.** 2705 245th St.
X18. (NSS #23) 24200 Sandridge Rd.	**18-1.** 24215 Sandridge Rd. **18-2.** 24120 Gile Pl.
X19. (NSS #24) 23400 Pacific Hwy	**19-1.** 23407 Pacific Hwy **19-2.** 1428 232rd Ln.
X20. (NSS #25) 227th & Birch Pl.	**20-1.** 22608 Birch Pl. **20-2.** 2516 227th Pl.

NOTE:
When you collect the repeats, you must sample every source that was in use when the original routine sample was collected.

Important Notes for Sample Collector:

♫ ♪ ♪ ♫:

E. Reduced Triggered Source Monitoring Justification (add sheets as needed):

No Reduced Triggered Source Monitoring Requested

F. Routine Sample Rotation Schedule

Month	No.	Routine Sites, 1st Round					Routine Sites, 2nd Round			
Jan	6	X-4	X-10	X-17			X-1	X-7	X-19	
Feb	6	X-5	X-14	X-20			X-13	X-15	X-18	
Mar	6	X-6	X-11	X-12			X-8	X-9	X-16	
Apr	8	X-2	X-4	X-10	X-17		X-1	X-3	X-7	X-19
May	8	X-5	X-11	X-14	X-20		X-8	X-13	X-15	X-18
Jun	9	X-2	X-6	X-7	X-11	X-12	X-9	X-10	X-16	X-19
Jul	9	X-4	X-5	X-11	X-14	X-20	X-3	X-8	X-13	X-18
Aug	9	X-2	X-7	X-11	X-12	X-17	X-3	X-10	X-16	X-19
Sep	9	X-1	X-5	X-8	X-14	X-20	X-4	X-11	X-15	X-18
Oct	8	X-2	X-6	X-8	X-13		X-9	X-10	X-16	X-19
Nov	7	X-1	X-5	X-8	X-20		X-3	X-11	X-17	
Dec	7	X-2	X-6	X-8	X-12		X-9	X-10	X-16	

G. Five Routine Sample Locations – Month after an Unsatisfactory Sample

Location/Address for Routine Sample Site(s) When Unsatisfactory Sample Occurs the Previous Month
Total number of routine samples required for any month after a sample with a coliform presence, per Table 2 in WAC 246-290-300(3)(f), is 6 to 9, the same as required during other months. So routine sample locations designated in Item E, above, will apply to months following any month with a coliform presence sample, with the following exceptions: 1. If a routine sample with coliform presence occurs in September, the sample schedule for October shall be the normal routine sample schedule for August. 2. If a routine sample with coliform presence occurs in October, the sample schedule for November shall be the normal routine sample schedule for May. 3. If a routine sample with coliform presence occurs in December, the sample schedule for January shall be the normal routine sample schedule for November.

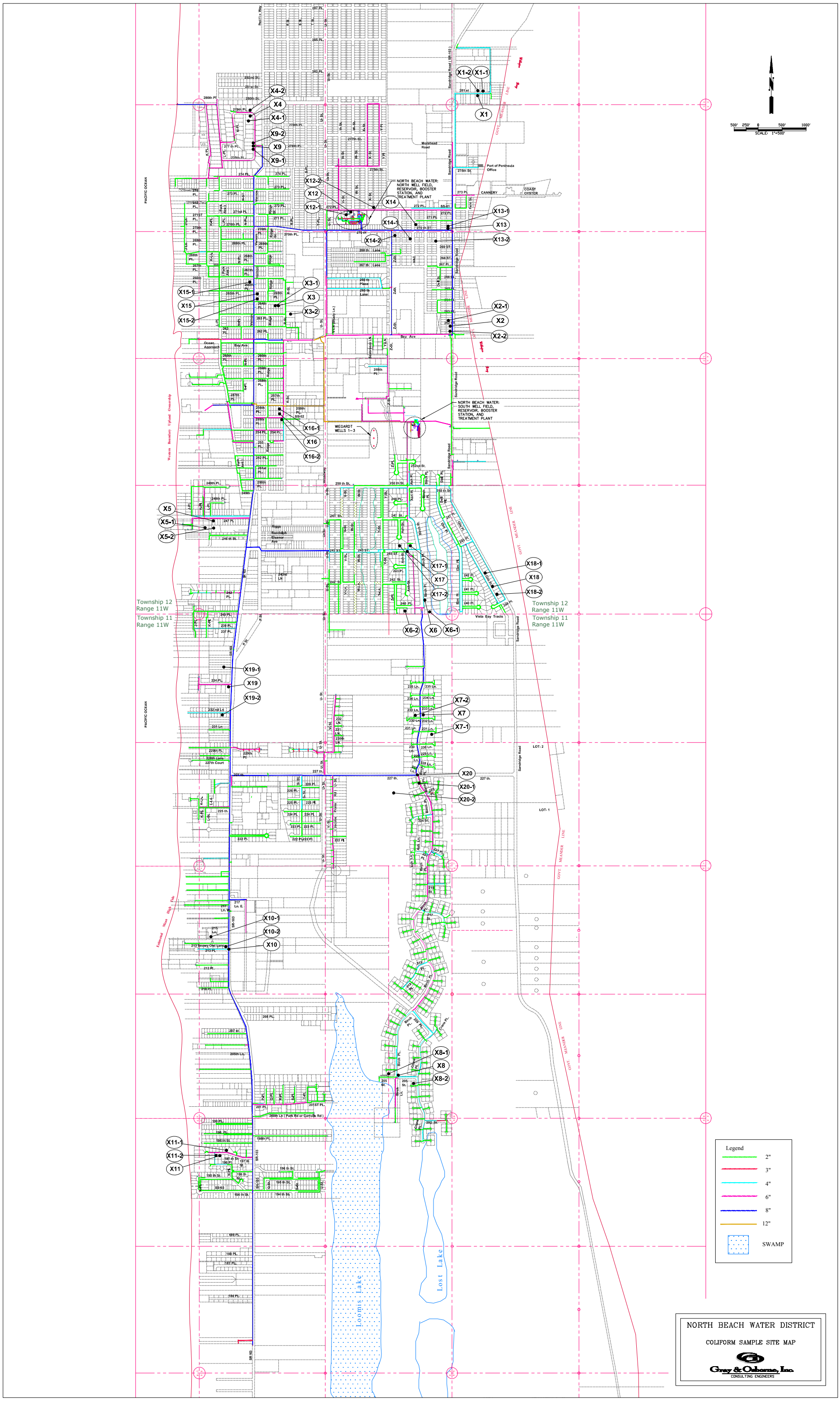
H. *E. coli*-present response plans

Distribution System *E. coli* Response Plan
If we have *E. coli* in our distribution system we will immediately: 1. Call DOH. 2. Take repeat samples 3. Call DOH to discuss repeat sample results and any further follow-up 4. Provide public notifications if required 5. Sampling for following month shall be per Item F, above

E. coli-Present Triggered Source Sample Response Plan
If we have *E. coli* in ANY Source water we will immediately: 1. Shut off contaminated source. 2. Call DOH. 3. Disinfect and flush contaminated source. 4. Resample contaminated source 5. Provide public notice if required

I. System Map

(Attached)


X1-2
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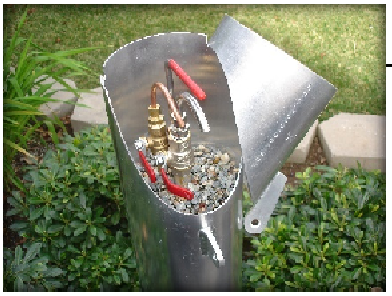
X10-2
X10
X8-1
X8
X8-2
X11-1
X11-2
X11
NORTH BEACH WATER: NORTH WELL FIELD, RESERVOIR, BOOSTER STATION, AND TREATMENT PLANT
NORTH BEACH WATER: SOUTH WELL FIELD, RESERVOIR, BOOSTER STATION, AND TREATMENT PLANT
WIEGARDT WELLS 1-3
Port of Peninsula Office
CANNERY
COAST OYSTER
Township 12 Range 11W
Township 11 Range 11W
PACIFIC OCEAN
Western Boundary Upland Ownership
GOVT MEANDER LINE
Sandridge Road
Morehead Road
Bay Ave
Ocean Approach
Vista Bay Tracts
LOT- 1
LOT- 2
Loomis Lake
Lost Lake
SR-103
SS-01
SS-02
SCALE: 1"=500'
Legend
2"
3"
4"
6"
8"
12"
SWAMP
NORTH BEACH WATER DISTRICT
COLIFORM SAMPLE SITE MAP
Gray & Osborne, Inc.
CONSULTING ENGINEERS



- NBWD - Sample Sites -

NSS #6: 3314 281st Street

Repeat 3409 281st St.

Repeat 3315 281st St.

NSS #7: 26200 Sandridge Rd.

Repeat 26215 Sandridge Rd.

Repeat 26205 Sandridge Rd.

NSS #8: 1719 264th Pl.

Repeat 1707 264th Pl.

Repeat 26300 R St.

NSS #9: 27900 O St.

Repeat 27811 0 St.

Repeat 1501 279th Pl.

NSS #10: 1206 247th Pl.

Repeat 1202 247th Pl.

Repeat: 1208 247th Pl.

- NBWD - Sample Sites -

NSS #11: 24010 Birch Pl.

Repeat 24006 Birch

Repeat 2704 240th PI

NSS #12: 23200 Birch Pl.

Repeat 2811 231st Ln

Repeat 2731 232st Ln

NSS #13: 20500 Birch Pl.

Repeat 20503 Birch Pl.

Repeat 20407 Crane Pl.

NSS #14: 21700 O St.

Repeat 21608 O St.

Repeat 21610 O St.

NSS #15: 21401 Pacific Hwy.

Repeat 21403 Pacific Hwy.

Repeat 1325 213th St.

- NBWD - Sample Sites -

NSS #16: 1311 197th Pl.

Repeat 1315 197th Pl.

Repeat 1306 197th Pl

NSS #17: 2218 272rd St.

Repeat 2212 272rd St.

Repeat 2419 272rd St.

NSS #18: 27003 Sandridge Rd.

Repeat 27005 Sandridge Rd.

Repeat 3016 270th St.

NSS#19: 2807 270th St.

Repeat 2812 270th St.

Repeat 2608 270th St.

NSS #20: 26500 Vernon Ave.

Repeat 26511 Vernon Ave.

Repeat 26414 Vernon Ave.

- NBWD - Sample Sites -

NSS #21: 1711 255th Pl.

Repeat 1716 256th Pl.

Repeat 1803 255th Pl.

NSS #22: 245th & Ash Pl.

Repeat 2709 245th St.

Repeat 2705 245th St.

NSS #23: 24200 Sandridge Rd.

Repeat 24215 Sandridge Rd.

Repeat 24120 Gile Pl.

NSS #24: 23400 Pacific HWY

Repeat 23407 Pacific HWY

Repeat 1428 232rd Ln.

NSS #25: 227th & Birch Pl.

Repeat 22608 Birch Pl.

Repeat 2516 227th Pl.

APPENDIX H

CONSUMER CONFIDENCE REPORTS

North Beach Water District
2010 Water Quality Report

This Consumer Confidence Report (CCR) has been prepared for your information to comply with a Federal law, which requires that water utilities provide water quality information to customers each year. The information is based on water samples taken before 2010.

This report is a snapshot of the quality of the water that we have provided. Included are details about where your water comes from, what it contains, and how it compares to Environmental Protection Agency (EPA) and state standards.

Some of the people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other macrobial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Your water comes from one well field located near the community.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791).

The sources of drinking water (both tap and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves through naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- *Macrobial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.*
- *Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.*
- *Pesticides and herbicides, which may come from a variety of sources such as agriculture and residential uses.*
- *Radioactive contaminants, which are naturally occurring.*
- *Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.*

For more information about your water and water system, call Michael J. Berlien at 360-665-4144.

In order to ensure that tap water is safe to drink, the Department of Health and EPA prescribes regulations, which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. These regulations require that water systems sample for lead and copper, Inorganic (iron, manganese, etc.), Volatile Organic (gasoline derivatives), radionuclides and Synthetic Organic Chemicals (pesticides) on a regular basis. In addition, we sample for coliform bacteria monthly.

Este informe contiene informacion muy importante sobre su aqua beber. Traduzcalo o hable con alguien que lo entienda bien.

The information attached to this report lists all the drinking water elements that were last detected. The presence of these elements in the water does not necessarily indicate that the water poses a health risk.

North Beach Water District

Water Quality Data Table

The table below lists all of the drinking water contaminants that we detected during the calendar year of this report. The presence of contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the data presented in this table is from testing done in the calendar year of the report. The EPA or the State requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not change frequently.

Important Drinking Water Definitions:

MCLG: Maximum Contaminant Level Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

MCL: Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

AL: Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

Contaminants (units)	MCLG	MCL	Your Water	Range Low	Range High	Sample Date	Violation	Typical Source
Contaminants								
Arsenic (ppb)	NA	10	8	NA		2008	No	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
Bromate	10	10	5.7	ND-22		2009	No	By-product of drinking water disinfection
Gross Alpha		15	4.5	ND-4.5		2009	No	Erosion of natural deposit of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation
Gross Beta		50	5.9	ND-5.9		2009	No	Decay of natural and man-made deposits of Certain minerals that are radioactive and may emit a forms of radiation known as photons and beta radiation
Nitrate [measured as Nitrogen] (ppm)	10	10	ND-0.86	NA		2009	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Radium		5	0.856	ND-0.856		2009	No	Erosion of natural deposits

Contaminant(s) (units)	MCLG	AL	Your Water	# of Samples > AL	Sample Date	Exceeds AL	Typical Source
Contaminants							
Copper (ppm)	1.3	1.3	0.028	0	2008	No	Erosion of natural deposits; Leaching from wood preservatives; Corrosion of household plumbing systems
Lead (ppb)	0	15	6	0	2008	No	Corrosion of household plumbing systems; Erosion of natural deposits

Units Description:

NA: Not applicable
ND: Not detected
NR: Not reported
MNR: Monitoring not required, but recommended.
ppm: parts per million, or milligrams per liter (mg/l)
ppb: parts per billion, or micrograms per liter (µg/l)

Additional testing has been completed in 2009 with no detections to report.

North Beach Water District
2011 Water Quality Report

This Consumer Confidence Report (CCR) has been prepared for your information to comply with a Federal law, which requires that water utilities provide water quality information to customers each year. The information is based on water samples taken before 2011.

This report is a snapshot of the quality of the water that we have provided. Included are details about where your water comes from, what it contains, and how it compares to Environmental Protection Agency (EPA) and state standards.

Some of the people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other macrobial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Your water comes from two well fields located near the community.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791).

The sources of drinking water (both tap and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves through naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

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- *Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.*
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- *Radioactive contaminants, which are naturally occurring.*
- *Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.*

For more information about your water and water system, call William Neal at 360-665-4144.

In order to ensure that tap water is safe to drink, the Department of Health and EPA prescribes regulations, which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. These regulations require that water systems sample for lead and copper, Inorganic (iron, manganese, etc.), Volatile Organic (gasoline derivatives), radionuclides and Synthetic Organic Chemicals (pesticides) on a regular basis. In addition, we sample for coliform bacteria monthly.

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The information attached to this report lists all the drinking water elements that were last detected. The presence of these elements in the water does not necessarily indicate that the water poses a health risk.

North Beach Water District

Water Quality Data Table

The table below lists all of the drinking water contaminants that we detected during the calendar year of this report. The presence of contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the data presented in this table is from testing done in the calendar year of the report. The EPA or the State requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not change frequently.

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Contaminants (units)	MCLG	MCL	Your Water	Range Low	Range High	Sample Date	Violation	Typical Source
Contaminants								
Arsenic (ppb)	NA	10	ND-8	NA		2010	No	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
Bromate	10	10	ND-15	ND-15		2010	No	By-product of drinking water disinfection
Gross Alpha		15	4.5	ND-4.5		2009	No	Erosion of natural deposit of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation
Gross Beta		50	5.9	ND-5.9		2009	No	Decay of natural and man-made deposits of Certain minerals that are radioactive and may emit a forms of radiation known as photons and beta radiation
Nitrate [measured as Nitrogen] (ppm)	10	10	ND-.22	NA		2010	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Radium		5	0.856	ND-0.856		2009	No	Erosion of natural deposits

Contaminant(s) (units)	MCLG	AL	Your Water	# of Samples > AL	Sample Date	Exceeds AL	Typical Source
Contaminants							
Copper (ppm)	1.3	1.3	0.028	0	2008	No	Erosion of natural deposits; Leaching from wood preservatives; Corrosion of household plumbing systems
Lead (ppb)	0	15	6	0	2008	No	Corrosion of household plumbing systems; Erosion of natural deposits

Units Description:

NA: Not applicable
ND: Not detected
NR: Not reported
MNR: Monitoring not required, but recommended.
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ppb: parts per billion, or micrograms per liter (µg/l)

Additional testing has been completed in 2010 with no detections to report.

North Beach Water District
2012 Water Quality Report

This Consumer Confidence Report (CCR) has been prepared for your information to comply with a Federal law, which requires that water utilities provide water quality information to customers each year. The information is based on water samples taken before 2012.

This report is a snapshot of the quality of the water that we have provided. Included are details about where your water comes from, what it contains, and how it compares to Environmental Protection Agency (EPA) and state standards.

Some of the people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other macrobial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

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North Beach Water District

Water Quality Data Table

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Contaminants								
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Bromate	10	10	ND-21	ND-21		2011	No	By-product of drinking water disinfection
Gross Alpha		15	4.5	ND-4.5		2009	No	Erosion of natural deposit of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation
Gross Beta		50	5.9	ND-5.9		2009	No	Decay of natural and man-made deposits of Certain minerals that are radioactive and may emit a forms of radiation known as photons and beta radiation
Nitrate [measured as Nitrogen] (ppm)	10	10	ND-1.29	NA		2011	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Radium		5	0.856	ND-0.856		2009	No	Erosion of natural deposits

Contaminant(s) (units)	MCLG	AL	Your Water	# of Samples > AL	Sample Date	Exceeds AL	Typical Source
Contaminants							
Copper (ppm)	1.3	1.3	ND-0.573	0	2011	No	Erosion of natural deposits; Leaching from wood preservatives; Corrosion of household plumbing systems
Lead (ppb)	0	15	ND-3	0	2011	No	Corrosion of household plumbing systems; Erosion of natural deposits

Units Description:

NA: Not applicable
ND: Not detected
NR: Not reported
MNR: Monitoring not required, but recommended.
ppm: parts per million, or milligrams per liter (mg/l)
ppb: parts per billion, or micrograms per liter (µg/l)

Additional testing has been completed with no detections to report.

North Beach Water District
2013 Water Quality Report

This Consumer Confidence Report (CCR) has been prepared for your information to comply with a Federal law, which requires that water utilities provide water quality information to customers each year. The information is based on water samples taken before 2013.

This report is a snapshot of the quality of the water that we have provided. Included are details about where your water comes from, what it contains, and how it compares to Environmental Protection Agency (EPA) and state standards.

Some of the people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other macrobial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

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- *Pesticides and herbicides, which may come from a variety of sources such as agriculture and residential uses.*
- *Radioactive contaminants, which are naturally occurring.*
- *Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.*

For more information about your water and water system, call William Neal at 360-665-4144.

In order to ensure that tap water is safe to drink, the Department of Health and EPA prescribes regulations, which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. These regulations require that water systems sample for lead and copper, Inorganic (iron, manganese, etc.), Volatile Organic (gasoline derivatives), radionuclides and Synthetic Organic Chemicals (pesticides) on a regular basis. In addition, we sample for coliform bacteria monthly.

Este informe contiene informacion muy importante sobre su aqua beber. Traduzcalo o hable con alguien que lo entienda bien.

The information attached to this report lists all the drinking water elements that were last detected. The presence of these elements in the water does not necessarily indicate that the water poses a health risk.

North Beach Water District
Water Quality Data Table

The table below lists all of the drinking water contaminants that we detected during the calendar year of this report. The presence of contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the data presented in this table is from testing done in the calendar year of the report. The EPA or the State requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not change frequently.

Important Drinking Water Definitions:

MCLG: Maximum Contaminant Level Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

MCL: Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

AL: Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

Contaminants (units)	MCLG	MCL	Your Water	Range Low	Range High	Sample Date	Violation	Typical Source
Contaminants								
Arsenic (ppb)	NA	10	ND-8	NA		2010	No	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
Bromate	10	10	ND-15	ND-15		2012	No	By-product of drinking water disinfection
Gross Alpha		15	4.5	ND-4.5		2009	No	Erosion of natural deposit of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation
Gross Beta		50	5.9	ND-5.9		2009	No	Decay of natural and man-made deposits of Certain minerals that are radioactive and may emit a forms of radiation known as photons and beta radiation
Nitrate [measured as Nitrogen] (ppm)	10	10	ND-1.29	NA		2012	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Radium		5	0.856	ND-0.856		2009	No	Erosion of natural deposits

Contaminant(s) (units)	MCLG	AL	Your Water	# of Samples > AL	Sample Date	Exceeds AL	Typical Source
Contaminants							
Copper (ppm)	1.3	1.3	ND-0.573	0	2011	No	Erosion of natural deposits; Leaching from wood preservatives; Corrosion of household plumbing systems
Lead (ppb)	0	15	ND-3	0	2011	No	Corrosion of household plumbing systems; Erosion of natural deposits
Microbiological Contaminants							
Total Coliform (# of monthly positive or missed samples)	0	1	3	NA	11/12	Yes	Naturally present in the environment

Units Description:

NA: Not applicable
ND: Not detected
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MNR: Monitoring not required, but recommended.
ppm: parts per million, or milligrams per liter (mg/l)
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Additional testing has been completed with no detections to report. Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure. Violation: Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.

North Beach Water District
2014 Water Quality Report

This Consumer Confidence Report (CCR) has been prepared for your information to comply with a Federal law, which requires that water utilities provide water quality information to customers each year. The information is based on water samples taken before 2014.

This report is a snapshot of the quality of the water that we have provided. Included are details about where your water comes from, what it contains, and how it compares to Environmental Protection Agency (EPA) and state standards.

Some of the people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other macrobial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Your water comes from two well fields located near the community.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791).

The sources of drinking water (both tap and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves through naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- *Macrobial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.*
- *Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.*
- *Pesticides and herbicides, which may come from a variety of sources such as agriculture and residential uses.*
- *Radioactive contaminants, which are naturally occurring.*
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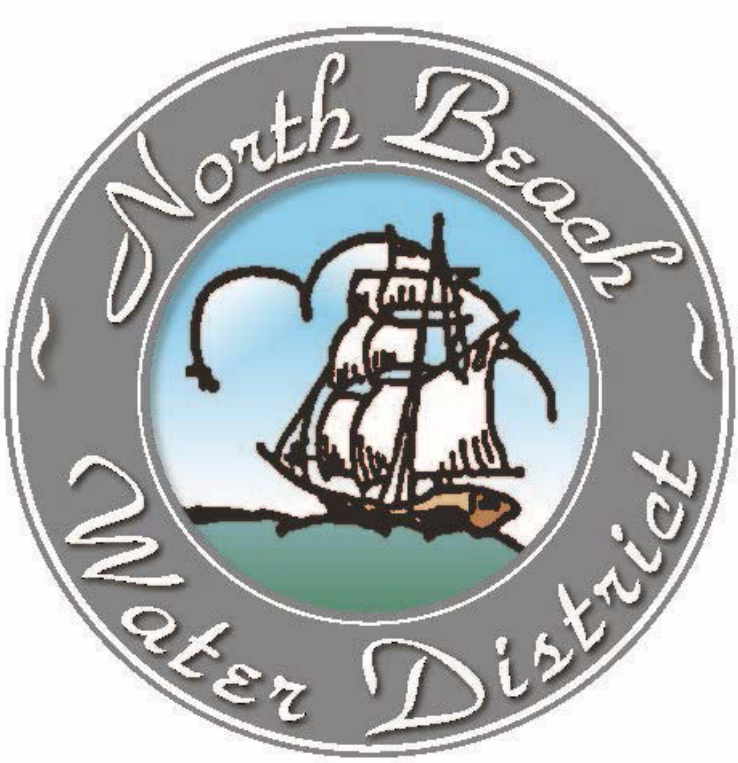
APPENDIX I

CROSS-CONNECTION CONTROL PROGRAM

CROSS CONNECTION CONTROL PROGRAM

Adopted December 22, 2014 by Resolution 29-2014

Revised:



MISSION STATEMENT

The mission of North Beach Water District is to provide high-quality water for residential, commercial, industrial, and fire protection uses that meets or exceeds all local, state, and federal standards and to provide courteous and responsive service at the most reasonable cost to our customers.

Table of Contents

Requirement for Program

North Beach Water District (District), pursuant to chapter 246-290-490 WAC, shall protect their public water system from contamination due to cross-connections. A cross-connection is defined, for the purpose of this program, as "any actual or potential physical connection between a potable water line and any pipe, vessel, or machine that contains or has a probability of containing a non-potable gas or liquid such that it is possible for a non-potable gas or liquid to enter the potable water system by backflow."

All public water systems are required to develop and implement cross-connection control (CCC) programs. The CCC program requirements are contained in chapter 246-290-490 WAC. The minimum required elements of a CCC program are:

1. Establishment of legal authority and program policies;
2. Evaluation of premises for cross-connection hazards;
3. Elimination and/or control of cross-connections;
4. Provision of qualified personnel;
5. Inspection and testing of backflow preventers;
6. Quality control of testing process;
7. Response to backflow incidents;
8. Public education for consumers;
9. Record keeping for CCC program; and
10. Special requirements for reclaimed water use.

Other CCC program requirements include:

1. Coordination with the Local Administrative Authority (LAA), i.e., the local building or plumbing official, regarding CCC activities;
2. Prohibition of the return of used water into the public water system (PWS) distribution system; and

3. Inclusion of a written CCC program in a Water System Plan (WSP) or a Small Water System Management Program (SWSMP).

Note: Throughout this CCC program the term “customer” is used. “Customer” as used herein means the property owner and/or occupant of the premises served by the District (i.e., whoever interfaces with the District regarding water service). Also, unless otherwise defined, all CCC-related terms used in this program have the same definitions as those contained in chapter 246-290-010 WAC.

Program Objectives

The objectives of the CCC program are to:

1. Reasonably reduce the risk of contamination of the public water distribution system; and
2. Reasonably reduce the District’s exposure to legal liability arising from the contamination of the public water distribution system originating from a customer’s premise’s plumbing system; and
3. Reasonably reduce the onerous application of the law on District customers by working to mitigate the need for isolation through education and the elimination of actual or existing cross-connection hazards and reducing practices that create hazards.

Summary of Program Decisions

The following table summarizes the major policy and program decisions adopted by the Board of Commissioners of North Beach Water District. The items in the table represent CCC program areas that have more than one acceptable approach or option.

Decision Summary Table for the North Beach Water District

Summary Table

Decision Item	Decision
1. Type of Program [General, WAC 246-290-490(2)(e)]	
a. Premises isolation only	YES
b. Premises isolation and in-premises protection (combination program)	NO
2. Extent of Coordination with LAA [WAC 246-290-490(2)(d)]	
a. Information exchange	YES
b. Interaction	NO
c. Joint program	NO
3. Relationship with Customer [Element 1]	
a. Signed service agreement or contract	NO
b. Ordinance/resolution; implied service agreement	YES
4. Enforcement of Corrective Action [Element 1]	
a. Rely upon shut-off of water service	YES
b. Rely upon District installed/owned/maintained premises isolation	YES
5. Assessment and Re-assessment of Hazard [Element 2]	
a. By District's staff or equivalent	YES
b. By CCS employed by customer; report reviewed by District's CCS	YES
6. Location and Ownership of Premises Isolation Assembly [Element 3]	
a. On District's service line	YES
b. On customer's service line	YES
7. CCS Option – District's Program Management [Element 4]	
a. District's staff member certified	YES
b. Inter-agency agreement or use other agency's CCS	NO
c. Contract with consultant CCS	NO
8. Testing of Assemblies [Element 5]	
a. By District-employed backflow assembly tester (BAT)	YES
b. By customer-employed (contractor) BAT	YES
9. Cost Recovery [WAC 246-290-100(4)(h) and –105(4)(p)]	
a. Borne by all customers (general water rates)	NO
b. Assessed to specific class (commercial meters)	NO
c. Each customer directly bears cost	YES

Required Elements of Program

This section describes how North Beach Water District intends to comply with each of the required program elements. Elements are numbered the same as they appear in WAC 246-290-490.

Element 1: Authorizing of a CCC Program.

The District's Board of Commissioners adopted Resolution 28-2014 on December 17, 2014, which authorizes the District to implement this CCC program. The resolution also authorizes the system to terminate water service to consumers who do not comply with the resolution. However, the primary method for protection of the distribution system will be the installation of a backflow preventer by the customer, at the customer's expense. The District, at its discretion, may install a backflow preventer if the customer fails to or refuses to install a required backflow preventer within the time allowed.

Element 2: Evaluating the Degree of Hazard.

Initial Cross-Connection Hazard Surveys

The procedures for evaluating the backflow prevention requirements for new and existing customers are as follows:

1. For all **new non-residential services**, the District will require that the customer submit with the application for water service an evaluation (performed at customer's expense) by a DOH-certified cross-connection control specialist (CCS) of the hazard posed, if any, by the proposed plumbing system, with recommendations for the installation at the meter of a double-check valve assembly (DCVA) or a reduced-pressure principle backflow assembly (RPBA) if needed. The District may accept the recommendations or submit the recommendations to a CCS employed by the District for peer review and concurrence, before acceptance.

As an alternative to the above requirement for a survey by a CCS, the customer may agree to install an approved air gap

(AG) or RPBA for premises isolation as a condition of service.

2. For all **new residential services**, the District will require that the customer submit with the application for water service a completed “Water Use Questionnaire” reproduced as Exhibit “A-2”. If the customer’s questionnaire indicates special plumbing, such as a lawn sprinkler system, or hazardous water use on the premises, the customer shall submit to the District an evaluation by a DOH-certified CCS of the hazard posed by the proposed special plumbing system, with recommendations for the installation at the meter of either a DCVA or an RPBA.

As an alternative to the above requirement for a survey by a DOH-certified CCS, the District’s CCS may specify the backflow preventer required to be installed as a condition of service.

3. For all **existing non-residential services**, the District will require the customer to submit to the District, within nine months of notification, an evaluation by a DOH-certified CCS of the hazard, if any, posed by the plumbing system, with recommendations for the installation at the meter of a DCVA or an RPBA if needed. The District may accept the recommendations or submit the recommendations to a CCS employed by the District for peer review and concurrence, before acceptance.

As an alternative to the above requirement for a survey by a DOH-certified CCS, the customer may agree to install an AG or RPBA for premises isolation within 90 days of notification by the District or an alternate time period acceptable to the District.

4. For all **existing residential services**, the District will require the customer to submit to the District, within four months of notification, a completed “Water Use Questionnaire.” If the customer’s reply indicates special plumbing or water use on the premises, the customer shall submit an evaluation by a DOH-certified

CCS of the hazard posed to the water system by the customer's plumbing system, with recommendations for the installation at the meter of either a DCVA or an RPBA.

As an alternative to the above requirement for a survey by a CCS, the District may specify the backflow preventer required to be installed as a condition of service. The District's CCS will provide guidance on the type of backflow preventer to be installed.

5. For all existing services, should the customer fail to supply the required information for a hazard assessment or fail to submit a completed "Water Use Questionnaire," the District may require the installation of an RPBA for premises isolation, or take other such actions consistent with the previously stated policies and bill the customer for the associated costs.

Cross-Connection Hazard Survey Schedule for Initial Hazard Assessments

The schedule for initial hazard assessment is outlined in Table 2.1 below. The schedule starts from the date the CCC program is established.

Table 2.1

Initial Assessment Task	**Schedule**
Assessment of all new connections	At time of application for water service
Identification and assessment of high-hazard premises which are listed on Table 9 of Washington Administrative Code (WAC) 246-290-490	Within nine months
Identification and assessment of hazardous premises supplemental to Table 9 of WAC 246-290-490	Within 12 months
Identification of residential connections with special plumbing facilities and/or water use on the premises	Within 15 months

Cross-Connection Survey Schedule for Hazard Re-Assessments

For subsequent cross-connection hazard surveys, procedures for evaluating the backflow prevention requirements are:

1. For **residential services,** the District will require the customer to submit to the District, within two months of District notification, a completed "Water Use Questionnaire." The procedure used for evaluating the hazard re-assessment and the potential change in the required backflow prevention will be the same as used for the initial hazard assessment.
2. For all **non-residential services**, the District will require the customer to submit to the District, within two months of District notification, a hazard re-assessment (at the customer's expense) by a DOH-certified CCS.

The District's CCS will, for a fee and upon request, perform the hazard re-assessment on the premises.

The frequency of hazard re-assessments will be as shown in Table 2-2 below:

Table 2.2

Type of Service	**Frequency of Re-Evaluation**
Any services with an Air Gap or RPBA installed for premises isolation	None required as long as the Air Gap and/or RPBA passes annual tests and/or annual inspections
Commercial services with DCVA installed for premises isolation	Every two years and upon change in use or ownership
Residential services with RPBA or DCVA installed for premises isolation	Every 5 years and upon change in use, ownership, or plumbing system (questionnaire)
Residential services with no known special plumbing or water use on the premises	Every 3 years and upon change in use, ownership, or plumbing system (questionnaire)

The District will inform the customer that the District's survey of a customer's premises (whether by a representative of the District or through the evaluation of a questionnaire

completed by the customer) is for the sole purpose of establishing the District's minimum requirements for the protection of the public water supply system, and that the required backflow protection will be commensurate with the District's assessment of the degree of hazard.

The District will also inform the customer or any regulatory agencies that the District's survey, requirements for the installation of backflow prevention assemblies, lack of requirements for the installation of backflow prevention assemblies, or other actions by the District's personnel or agent do not constitute an approval of the customer's plumbing system or an assurance to the customer or any regulatory agency of the absence of cross-connections.

Element 3: Elimination or Control of Cross-Connections.

Backflow Preventer Requirements

The following service policy shall apply to all new and existing customers:

1. The District will require that water service to all **non-residential customers** where actual or potential cross-connection hazards exist be isolated at the meter by an air gap or a DOH-approved RPBA or DCVA commensurate with the level of hazard and acceptable to the District. All high-hazard connections of the type described in Table 9 of WAC 246-290-490, reproduced as Exhibit "B", shall be isolated with an air gap or an RPBA.
2. The District will require all **residential customers** with facilities of the type described in Table 9 of WAC 246-290-490, reproduced as Exhibit "B", to be isolated with an air gap or an RPBA. All other residential customers with special plumbing or water use on the premises that create an actual or potential cross-connection hazard will be isolated with an RPBA or a DCVA, as determined by the District's Cross-connection Specialist. "Special plumbing" includes, but is not limited to, the following:
    a. A lawn irrigation system;
    b. A solar heating system (some models are exempt);
    c. Piping for livestock watering, hobby farming, etc.;
    d. Hot tubs and swimming pools;
    e. Ornamental Fountains (some models are exempt);
    f. Residential fire sprinkler system;
    g. Boilers of hydronic heating systems;
    h. Property containing a small boat moorage;
    i. Repeat history of cross-connections.

3. All remaining residential customers will be isolated at the meter by a District-owned and -installed ASSE standard #1024-2004 dual check valve. These check valves provide a measure of practical protection but no regulatory protection from backflow hazards.

Customers are considered to have an implied contract with the District that requires the customer to bear all reasonable costs of service. In the event a customer is required to isolate their premises by RPBA or DCVA, the cost will include, but not be limited to, those necessary to:

- Purchase and immediately install approved RPBA or DCVA downstream of the water meter in accordance with the District's standards described hereinafter; and
- Maintain, test, and inspect the RPBA or DCVA in accordance with the District's standards described hereinafter.

For new customers, the District will not turn on water (except for testing purposes) at the meter until the customer complies with the above requirements.

Refusal or failure on the part of the customer to comply with the District's installation, testing, and maintenance requirements shall constitute a breach of contract by the customer and as a result, the District will:

1. Install the RPBA or DCVA at the customer's expense immediately upstream of the water meter in accordance with the Districts standards described hereinafter; and
2. Maintain, test and inspect, at the customer's expense, the RPBA or DCVA in accordance with the Districts standards described hereinafter; or
3. Discontinue water service until the customer complies with the installation, testing, or maintenance requirements to the District's satisfaction.

The District will only install an RPBA or DCVA to isolate a customer's premises after providing ninety (90) days' advance notice and a detailed estimate of the initial cost and annual cost of maintenance and testing of the RPBA or DCVA by

certified mail. During the ninety (90) days the customer will be encouraged to:

1. Eliminate the actual or potential cross-connection, or
2. Install a DOH-approved RPBA or DCVA based on the level of hazard, or
3. Enter into the District's Backflow Preventer Assistance Program described hereinafter.

The customer will pay the District all of their reasonable costs associated with the above actions.

Backflow Preventer Assistance Program

The Backflow Preventer Assistance Program (BPAP) is adopted as a customer service to the ratepayers of the District. When a ratepayer has a potential or actual cross-connection on their premises, they will be required to isolate their premises from the water system with a backflow preventer approved by the Washington State Department of Health (WSDOH). The backflow preventer will be maintained and tested at least annually and the results of the test will be forwarded to the ratepayer and the WSDOH upon request. The BPAP will provide District-owned, -maintained, and -tested backflow preventers to ratepayers' premises at a low monthly fee established by the Board of Commissioners. The fee schedule will be based on the principle that the BPAP will be self-supporting.

Customers desirous of entering the BPAP will execute a Backflow Preventer Assistance Agreement reproduced as Exhibit "J", whereby they will agree to pay the monthly fee identified in the District's Rules and Regulations for the specific Backflow Preventer installed abutting their premises.

Approved Backflow Preventers and Installation

All backflow preventers relied upon by the District to protect the public water system shall meet the definition of "approved backflow preventer" as contained in WAC 246-290-010. The District will obtain and maintain a current list of

assemblies approved for installation in Washington State from the DOH Office of Drinking Water.

All backflow preventers will be installed in:

1. The orientation for which they are approved;
2. A manner and location that facilitates their proper operation, maintenance, and testing or inspection;
3. A manner that will protect them from weather-related conditions such as flooding and freezing; and
4. Compliance with applicable safety regulations.

Installation standards contained in the most recently published edition of the Pacific Northwest Section, American Water Works Association (PNWS-AWWA) CCC Manual or the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research (USCFCCCHR) CCC Manual shall be followed unless the manufacturer's requirements are more stringent.

The District has no regulatory responsibility or authority over the installation and operation of the customer's plumbing system. The customer is solely responsible for compliance with all applicable regulations and for prevention of contamination of his/her plumbing system from sources within his/her premises. Any action taken by the District to survey plumbing, inspect or test backflow prevention assemblies, or to require premises isolation (installation of DCVA or RPBA on service) is solely for the purposes of reducing the risk of contamination of the District's distribution system.

The District will inform the customer that any action taken by the District shall not be construed by the customer as guidance on the safety or reliability of the customer's plumbing system. The District will not provide advice to the customer on the design and installation of plumbing other than through the general public education program discussed in Element 8.

Except for easements containing the District's distribution system, the District will not undertake work on the

customer's premises. In the event the existing water meter is located within the boundaries of the customer's property, the District, when it becomes aware of the condition, will remove the meter back to within the road easement or right of way.

Schedule for Installation of Backflow Preventers

Table 3.0 on the following page shows the schedule that the District will follow for the installation of backflow preventers when they are required (based on the hazard evaluation)

Table 3.0

Type of Service	**Schedule**
New connections with cross-connection hazards	Before service is initiated
Existing connections with Table 9-type hazards and other high cross-connection hazards	Within 90 days after notification
Existing connections with other than Table 9 of WAC 246-290-490 or high cross-connection hazards	Within 180 days after notification (suggested)
Existing fire protection systems using chemicals or supplied by unapproved auxiliary water source	Within 90 days after notification
Existing fire protection systems not using chemicals and supplied by District's water	Within 1 year after notification (suggested)

The District may consider granting an extension of time for installation of a backflow preventer for an existing connection if requested by the premise's owner.

Element 4: Qualified Person.

Program Administration

The responsibility for administration of the CCC Program rests with the District. General policy direction and risk management decisions are established by the Board of Commissioners of North Beach Water District.

The District's General Manager and at least one other employee will be certified by DOH as a Cross-connection Specialist (CCS) to develop and implement the CCC program. As an alternative, or when no staff or employees are properly qualified, the District may retain a DOH-certified CCS on contract to provide the necessary expertise and services.

The following cross-connection-related tasks will be performed by or under the direction of the District's General Manager or other CCS either on staff or under contract:

- Preparation of and recommendations regarding changes to the CCC program;
- Performance of and/or reviews of CCC hazard evaluations;
- Recommendations on the type of backflow preventer to be installed;
- Recommendations on schedules for retrofitting of backflow preventers;
- Inspections of backflow preventers for proper application and installation;
- Reviews of backflow preventer inspection and test reports;
- Reviews of backflow testing quality control information;
- Recommendations and/or granting of exceptions to mandatory premises isolation;
- Participation in or cooperation with other water utility staff in the investigation of backflow incidents and other water quality problems;

- Completion of Backflow Incident Reports; and
- Completion of CCC Activity and Program Summary Reports.

The District may delegate other CCC program activities to other personnel who are not certified CCSs, including clerical support staff. These activities include:

- Administration of paperwork associated with service agreements;
- Mailing, collecting, and initial screening of hazard evaluation/water use questionnaires;
- Mailing of assembly testing notices;
- Receiving and screening of assembly testing reports;
- CCC program database administration and record keeping;
- Dissemination of public education material; and
- Assisting tasks associated with coordination with Pacific County Community Development Division.

Element 5: Inspection and Testing.

Inspection and Testing of Backflow Preventers

All backflow preventers that the District relies upon for protection of the water system will be subject to inspection and, if applicable, testing.

Inspection and testing of backflow preventers will be as follows:

- The District's DOH-certified CCS will inspect backflow preventers for proper application (i.e., to ensure that the preventer installed is commensurate with the assessed degree of hazard).
- Either a DOH-certified CCS or backflow assembly tester (BAT) will perform inspections of backflow preventers for correct installation.
- A DOH-certified backflow assembly tester will test all assemblies relied upon by the District to protect the public water system.

Frequency of Inspection and Testing

Inspection and testing of backflow preventers will be conducted:

- At the time of installation;
- Annually after installation;
- After a backflow incident; and
- After repair, reinstallation, relocation, or re-plumbing.

The District may require a backflow preventer to be inspected and/or tested more frequently than once a year, when it protects against a high-health hazard or when it repeatedly fails tests or inspections.

Responsibility for Inspection and Testing

The District will be responsible for inspection, testing, maintenance, and replacement of all District-owned backflow preventers. The customer whose premises is being isolated by

the District's backflow preventer will pay the District for all cost associated with inspection, testing, maintenance, and replacement of the District-owned backflow preventer.

The District will require the customer to be responsible for inspection and testing of backflow preventers owned by the customer. The customer shall employ, at customer expense, a DOH-certified BAT, pre-approved by the District, to conduct the inspection and test within the time period specified in the testing notice sent by the District. The test report shall be completed and signed by the BAT, then countersigned and returned by the customer to the District, before the due date specified by the District. The customer may request an extension of the due date for returning a test report by submitting a written request to the District. The District may grant one extension for up to 90 days.

Approved Test Procedures

The District will require that all assemblies relied upon to protect the public water system be tested in accordance with DOH-approved test procedures as specified in WAC 246-290-490(7)(d).

Notification of Inspection and/or Testing

The District will notify in writing all customers who own backflow preventers to have their backflow preventer(s) inspected and/or tested. Notices will be sent out not less than 30 days before the due date of the inspection and/or test. The notice will also specify the date (up to 30 days after the due date of the inspection and/or test date) by which the inspection/test report must be received by the District.

Enforcement

When a customer fails to send in the inspection/test report within 15 days after the due date specified, and the District has not approved an extension to the due date, the District will take the following enforcement action:

- The District will send a second notice giving the customer an additional 15 days to send in the inspection/test report.
- If the customer has not sent in the inspection/test report within 10 days of the due date given in the second notice, the District will send a third notice, by certified mail, giving the customer an additional 15 days to send in the report. The notice will also inform the customer that failure to satisfactorily respond to this notice will result in water service shut-off.
- The District will send copies of the third notice to the owner and occupants of the premises (if different from the customer).
- If the owner and/or occupants have not responded satisfactorily to the District within 10 days of the due date specified in the third notice, the District will implement water service shut-off procedures.
- At any time prior to shut-off, the District may, if requested by customer, arrange for the inspection and/or testing of the customer-owned backflow preventers by a certified BAT and will bill the customer the actual cost of inspection and/or testing plus reasonable administrative costs. Collection and enforcement procedures for such charges will be the same as for other water utility charges.

Element 6: Testing Quality Assurance Program.

List of Pre-Approved BATs

The District will maintain a list of local, DOH-certified BATs that are pre-approved by the District to perform the following activities:

- Backflow preventer inspection for proper installation; and
- Backflow assembly testing.

The list will be revised annually or more frequently if necessary.

Pre-Approval Qualifications

BATs who wish to be included on the District's pre-approved list and/or provide testing in the District's service area must apply to the District and furnish the following information:

- Evidence of current DOH certification in good standing;
- Make and model of testing equipment (BAT listing only);
- Evidence of test equipment verification of accuracy and/or calibration within the past 12 months (BAT listing only);
- Evidence showing possession of a license to operate a business in Washington State along with a valid bond and insurance.

Quality Assurance

The District's CCS will review within 30 days of receipt the backflow preventer inspection/test report forms submitted by the customer. The District's CCS may accept reports that are signed by a BAT not on the pre-approved BAT list provided that the same information as listed in "Pre-Approval Qualifications" is also submitted to the District along with the backflow preventer inspection/test report.

The District's CCS will provide follow-up on test reports that are deficient in any way.

The District’s CCS will report incidences of fraud or gross incompetence on the part of any BAT or CCS to DOH Operator Certification program staff.

Element 7: Responding to Backflow Incidents.

Backflow Incident Response Plan

The District has developed a backflow incident response plan, reproduced and attached as Exhibit “H”, that will be part of the water system’s emergency response program as required by WAC 246-290-415(2). The incident response plan will include, but will not be limited to:

- Notification of affected population;
- Notification and coordination with other agencies, such as DOH and Pacific County Environmental Health Division;
- Identification of the source of contamination;
- Isolation of the source of contamination and the affected area(s);
- Cleaning, flushing, and other measures to mitigate and correct the problem; and
- Corrective action to prevent future backflow occurrences.

Technical Resources

The District will use the most recently published edition of the manual, Backflow Incident Investigation Procedures, published by the PNWS-AWWA as a supplement to the Backflow Incident Response Plan for North Beach Water District.

Element 8: Public Education Program.

Customer Education

The District will distribute with water bills or by other means, at regular intervals, public education brochures to system customers. For residential customers, such brochures will describe the cross-connection hazards in homes and the recommended assemblies or devices that should be installed by the homeowner to reduce the hazard to the public water system. The education program will emphasize the responsibility of the customer in preventing the contamination of the public water supply. The District's staff will produce the public education brochures or the District will obtain brochures from:

- PNWS-AWWA;
- Spokane Regional Cross-Connection Control Committee (SRC4);
- Western Washington Cross-Connection Prevention Professionals Group (The Group);
- USC FCCCHR;
- Other national backflow prevention associations, such as the American Backflow Prevention Association (ABPA); and/or
- Other water utilities (with prior approval).

The information distributed by the District will include, but not be limited to, the following subjects:

- Cross-connection hazards in general;
- Irrigation system hazards and corrective actions;
- Fire sprinkler cross-connection hazards;
- Importance of annual inspection and/or testing of backflow preventers; and
- Thermal expansion in hot water systems when backflow preventers are installed for premises isolation.

The District will distribute information brochures to all customers every two to three years, and to every new customer.

Element 9: Records.

Types of Records and Data to be maintained

The District will maintain records of the following types of information required by WAC 246-290-490:

- Service connections/customer premises information including:
  - Assessed degree of hazard; and
  - Required backflow preventer to protect the public water system.
- Backflow preventer inventory and information including:
  - Air gap (AG) location, installation and inspection dates, inspection results and identity of person conducting inspection;
  - Backflow assembly location, assembly description (type, manufacturer, make, model, size, and serial number), installation, inspection and test dates, test results and data, and identity of person performing test; and
  - Information on atmospheric vacuum breakers used for irrigation system applications, including manufacturer, make, model, size, dates of installation and inspections, and identity of person performing inspections.

The District will maintain records on all assemblies that protect the public water system from contamination. At a minimum, the District will maintain records on all premises isolation assemblies required to protect the public water system.

Reports to be Prepared and Submitted to DOH

The District will prepare the following reports required by WAC 246-290-490, which include:

- Cross-connection control program activities report for the calendar year, to be sent to DOH when requested;

- Cross-connection control program summary information when required or when there are significant policy changes;
- Backflow incident reports to DOH (and voluntarily to the PNWS-AWWA CCC Committee); and
- Documentation when exceptions to mandatory premises isolation are granted.

The District's CCS will prepare and sign all CCC-related reports required by WAC 246-290-490.

The General Manager of North Beach Water District shall sign all CCC reports before submission to DOH.

Element 10: Cross-connection Control for Reclaimed Water.

At this time, the District does not receive or distribute reclaimed water. In the event that reclaimed water use is proposed within the District's service area, the Board of Commissioners of North Beach Water District will make all cross-connection control requirements mandated by the Permitting Authority in accordance with Chapter 90.46 RCW part of the written CCC program plan and comply with such additional requirements.

Coordination with Local Administrative Authority

Both WAC 246-290-490 and the Uniform Plumbing Code amended for Washington require coordination between the water District and the Local Administrative Authority (LAA) in all matters pertaining to cross-connection control.

The District will provide a copy of this CCC program to Pacific County Department of Community Development via a copy of the District's water system plan or in a separate document. The District will inform the LAA of any changes in policy or procedure that may impact the LAA.

The District will provide information to the LAA in a timely manner regarding any:

- Requirement imposed on a residential customer for the installation of a DCVA or an RPBA on the service, with a description of the cross-connection hazard identified;
- Upgrade of the premises isolation backflow preventer, i.e., from a DCVA to an RPBA;
- Action taken to discontinue water service to a customer; and
- Backflow incident known by the District to have contaminated the public water system or a customer's plumbing system.

Prohibition of Return of Used Water

The District must prohibit the intentional return of used water to the District's distribution system per WAC 246-290-490 (2)(l).

Used water is defined as water that has left the control of the District. This includes water used for heating and cooling purposes and water that may flow back into the distribution system from customers with multiple connections.

It is the policy of the District to:

- Prohibit the intentional return of used water to the distribution system by any customer served by the public water system; and
- Require that all customers with multiple connections, where the hydraulics permit the potential return of used water, to install a backflow preventer (DCVA or RPBA) commensurate with the degree of hazard at each point of connection.

Unapproved Auxiliary Supplies (potable water or irrigation wells)

All water supplies other than those owned by the District are considered unapproved auxiliary supplies as defined in chapter 246-290-010 WAC. The District will require backflow protection for customers with auxiliary supplies on their premises as follows:

- Per Table 9 of WAC 246-290-490, the District will require the installation of an RPBA for premises isolation at the service connection to any customer having an unapproved auxiliary supply on the premises that is connected to or has the potential to be connected to the District's water system.
- The District may require the installation of a DCVA for premises isolation at the service connection to any customer with an unapproved auxiliary water supply not interconnected with the District's water system where the customer's plumbing is complicated or the

District's Cross-connection Specialist determines that the potential for cross-connection exists.

Tanker Trucks

The District may allow tanker trucks to obtain water from the District's water system under the following conditions:

- The tanker truck is equipped with an approved AG or an approved RPBA with a current satisfactory inspection or test report.
- The tanker truck will obtain water from District-designated watering points only and under the direct supervision of a District employee.

Temporary Connections

The District will not supply water through temporary connections, such as those used for construction projects or main disinfection, except through a backflow preventer arrangement approved by the District. The applicant for the temporary connection shall document that the backflow preventer is a DOH-approved model and has passed an inspection and/or test within the past 12 months and/or upon relocation, whichever is more recent.

The District will require that interties with other public water systems or wholesale customers be isolated at the point of delivery by:

- A minimum of a DCVA; and
- A minimum of an RPBA if the District considers the purchasing system or wholesale customer to pose a high-health hazard to the District's system.

The District may waive or reduce the level of protection at the intertie if the purchasing public water system or wholesale customer:

- Is a Group A public water system not exempt from DOH regulation as per WAC 246-290-020(2);
- Has a CCC program that complies with WAC 246-290-490 and has been approved by DOH; and

- Implements the CCC program at a level satisfactory to the District.

Relationship to Other Planning and Operations Program Requirements

The District will consider the requirements and consequences of the CCC program on the utility's planning and operations requirements. Such considerations include, but are not limited to, ensuring that:

- Adequate communication exists and is promoted between CCC program personnel and other water utility staff;
- Adequate training be provided to all staff to recognize potential cross-connection control problems;
- Cross-connection issues be considered in water quality investigations;
- The design of the water distribution system makes adequate provisions for expected head losses incurred through the installation of or experienced by backflow assemblies;
- CCC program personnel be consulted in the design of water and wastewater treatment facilities and when proposals are made to receive or distribute reclaimed water;
- Operations under normal and abnormal conditions do not result in excessive pressure losses; and
- Adequate financial and administrative resources are available to carry out the CCC program.

Exhibit A-1 Water Use Questionnaire for Exiting Residential Customers

Water Use Questionnaire - For Existing Residential Customers

(1) NBWD Account Number: _____-_____-_____-_____-_____.

(you will find your NBWD account number on your water bill)

Please provide your Pacific County Tax Parcel Number(s):(attach list if needed)

_____-_____-_____-_____-_____-_____-_____-_____-_____-_____-_____.

_____-_____-_____-_____-_____-_____-_____-_____-_____-_____-_____.

(you will find your tax parcel number on your Pacific County property tax statement)

(2) Is your Property an Undeveloped lot? Yes ☐ No ☐

(If you checked yes skip section 3 through 5 below)

(3) Please tell us how many of the following you have on your property:

Residences ☐ RV Sites ☐ Apartments ☐ Barns ☐

Enter the nunber of each you have on your property or zero if you do not have any. Please **do not leave any box blank**.

(4) Do you have a home based business? Yes ☐ No ☐

If you checked yes please tell us about your business. Provide a brief descripion of the business. You may use a separate sheet.

_____

_____

_____

(5) Please check yes if you have any of the special plumbing or activates listed below or No if you do not. Please do not leave any of the boxes blank.

Yes	No	Special Plumbing or Activity Present on Your Property
		Underground lawn sprinkler or irrigation system (automatic or manual)
		Drip irrigation system (automatic or manual)
		Green house
		Water well or irrigation well
		Utility sink (with hose bib threaded faucet)
		Boiler or hydronic heating system
		Ornamental outdoor fountain
		Fire suppression sprinkler system (residential NFPA 13D)
		Livestock or horses (farm or hobby farm chickens, rabbits, etc.)
		Swimming pool or hot tub

Continued on Back

Yes	No	Special Plumbing or Activity Present on Your Property
		Solar thermal collector (solar panels)
		Darkroom (photography
		Home dialysis machine
		Unidentified water pipes (old pipes that you do not know where they go)
		Water softener or water treatment equipment that automatically backwashes to a drain.
		Do you currently have a testable backflow preventer installed on your property?

(6) Please provide your current mailing address:	(7) Please provide the address of NBWD property:

(8) Please provide your:	(9) Please provide your:
Phone#:	Emergency Phone#:
Cell#:	Email Address:

(10) Comments (Optional)

(11) I certify that I am the owner of the real property identified by the Pacific County tax parcel number(s) listed in section 1 or the owners authorized agent and that the above information is true, correct, and complete to the best of my knowledge and belief.

Signature

Date

Print Name of Signer

Check Box if Agent ☐

Phone Number of signer (if not listed above)

Exhibit A-2 Water Use Questionnaire for New Residential Customers

Water Use Questionnaire - For New Construction Residential Customers

(1) NBWD Account Number: _____-_____-_____-_____-_____.

(LEAVE BLANK NBWD will issue you an account number when your application is approved)

Please provide your Pacific County Tax Parcel Number(s):(attach list if needed)

_____-_____-_____-_____-_____-_____-_____-_____-_____-_____-_____.

_____-_____-_____-_____-_____-_____-_____-_____-_____-_____-_____.

(you will find your tax parcel number on your Pacific County property tax statement)

(2) Please tell us how many of the following you plan to have on your property:

Residences ☐ RV Sites ☐ Apartments ☐ Barns ☐

Enter the nunber of each you have on your property or zero if you do not plant to have any. Please **do not leave any box blank**.

(3) Will you have a home based business? Yes ☐ No ☐

If you checked yes please tell us about your business. Provide a brief descripion of the business. You may use a separate sheet.

_____

_____

_____

(4) Please check yes if you have any of the special plumbing or activates listed below or No if you do not. Please do not leave any of the boxes blank.

Yes	No	Special Plumbing or Activity Present on Your Property
		Underground lawn sprinkler or irrigation system (automatic or manual)
		Drip irrigation system (automatic or manual)
		Green house
		Water well or irrigation well
		Utility sink (with hose bib threaded faucet)
		Boiler or hydronic heating system
		Ornamental outdoor fountain
		Fire suppression sprinkler system (residential NFPA 13D)
		Livestock or horses (farm or hobby farm chickens, rabbits, etc.)
		Swimming pool or hot tub
		Solar thermal collector (solar panels)
		Darkroom (photography

Continued On Back

Yes	No	**Special Plumbing or Activity Present on Your Property**
		Home dialysis machine
		Unidentified water pipes (old pipes that you do not know where they go)
		Water softener or water treatment equipment that automatically backwashes to a drain.
		Do you currently have a testable backflow preventer installed on your property?

(5) Please provide your current mailing address:	(6) Please provide the address of NBWD property:

(7) Please provide your:	(8) Please provide your:
Phone#:	Emergency Phone#:
Cell#:	Email Address:

(9) Comments (Optional)

(10) I certify that I am the owner of the real property identified by the Pacific County tax parcel number(s) listed in section 1 or the owners authorized agent and that the above information is true, correct, and complete to the best of my knowledge and belief.

Signature Date

Print Name of Signer Check Box if Agent ☐

Phone Number of signer (if not listed above)

Exhibit B Table 9

WAC 246.290.490

Table 9

Agricultural (farms and dairies)	Laboratories
Beverage bottling plants	Metal plating industries
Car washes	Mortuaries
Chemical plants	Petroleum processing or storage plants
Commercial laundries and dry cleaners.	Piers and docks
Premises where both reclaimed and potable water are provided	Radioactive material processing plants or nuclear reactors*
Film processing plants	Survey access denied or restricted
Food processing plants	Wastewater lift stations and pumping stations
Hospitals, medical centers, nursing homes, veterinary, medical and dental clinics, and blood plasma centers	Wastewater treatment plants*
Premises with separate irrigation systems using the purveyor's water supply and with chemical addition+	Premises with an unapproved auxiliary water supply interconnected with the potable water supply

+ For example, parks, playgrounds, golf courses, cemeteries, estates, etc.

* RPBA's for connections service these premises are acceptable only when used in combination with an in-plant approved air-gap, otherwise the purveyor shall require an approved air gap at the service connection.

Exhibit C Application for New Water Service

Application for New Water Service

Applicants Name: _____

Co-Applicants Name: _____

Billing Address: _____

City: _____ State._____ Zip: _____

Service Address: _____ Ocean Park, WA 98640

Legal description of property to receive water service (may attach): _____

_____

_____

_____

_____

Pacific County Parcel#: ____-____-____-____-____-____-____-____-____-____-____-____.
(one number for each line total 11 numbers)

Primary Phone 1: _____

Alternate Phone 2: _____

Emergency Phone: _____
(How would you like the District to contact you in the unlikely event there is a property damaging leak affecting your premises?)

Email Address: _____

Type of Service:

☐ Residential Single

☐ Residential Multi-Family – Number of Units: _____

☐ Commercial – _____ Gallons per Day (estimated)

☐ Industrial - _____ Gallons per Day (estimated)

Will you be installing fire sprinklers? Yes ☐ No ☐
(If yes, you will need to provide a CCS risk assessment and install an approved backflow prevention assembly prior to connection.)

Continued on Back

Based on the information provided above North Beach Water District provided the following estimate for water service:

General Facilities Charge (Sec. 1.01.350) $ _____

Local Facilities Charge (Sec. 1.01.270) $ _____

Meter Installation Charge (Sec. 1.01.190) $ _____

Other: _____ $ _____

This estimate is valid for thirty (30) days after the date signed by NBWD representative.

By: _____ Date _____

Print Name: _____

The undersigned applicant(s) hereby applies for a water service connection to provide water service, as described in this application to the above described real property. The applicant(s) represents that they are the owner(s) of the above described real property and as a condition of North Beach Water District providing and continuing to provide water service, the applicant, by signing this application, agrees to comply with all the conditions of service, and other rules and regulations found in Resolution 12-2008 “Rules and Regulations”, the latest revision thereof. Furthermore, the Applicant(s) acknowledge they have received a copy of the current rules and regulations and have reviewed the conditions of service and along with all of the other rules and regulations found therein.

Applicant's Signature _____ Date _____

Co-Applicant's Signature _____ Date _____

Exhibit D CCC Site Survey Form

Cross Connection Site Survey Form

This form is intended to identify any actual or potential physical connections between a public water system and any source of non-potable liquid, solid, or gas that could contaminate the potable water supply by backflow. Washington State requires all community water systems to implement a cross connection control program in harmony with **WAC 246.290.490**. The purpose of the District's cross-connection control program is to protect our customers and the public water system from contamination via cross-connections. Information collected during the investigation is confidential and will not be voluntarily shared with any other persons or entities. Your cooperation with this investigation is required. Failure to cooperate with this investigation may result in the discontinuance of your water service.

Property Owner:
Name:
Address:
Account #:
Type of Service: ☐Domestic ☐ Industrial ☐ Recreational ☐Commercial ☐ Other _____ _
Owner or Representative Attending Investigation:
Name:
District CCS Performing Investigation:
Name: CCS#
Others Attending Investigation:
Name:
Name:
Name:
Reason for Investigation:
Is the premises being rented or leased? ☐ Yes ☐ No
Does the premises have an auxiliary water source? (well of surface water) ☐ Yes ☐ No
If Yes, Is the auxiliary water source connected to the drinking water pipe? ☐ Yes ☐ No

Does the premises have a booster pumps or water storage systems? ☐ Yes ☐ No
Does the premises have a heat exchanger or solar heating system? ☐ Yes ☐ No
Does the premises have an automatic yard or garden watering system? ☐ Yes ☐ No
Does the premises have a dark room or X-ray equipment? ☐ Yes ☐ No
Does the premises have a chemical injector system? ☐ Yes ☐ No
Does the premises have any pools, ponds or hot tubs? ☐ Yes ☐ No
Does the premises have a water softener of filtration equipment? ☐ Yes ☐ No
Does the premises have a fire sprinkler system? ☐ Yes ☐ No
Does the premises have a commercial kitchen or laundry ☐ Yes ☐ No
Are all areas available for inspection? ☐ Yes ☐ No
Did the District investigator observe any actual or potential cross connections during the investigation: ☐ Yes ☐ No
List actual of potential cross connections:
Are there any backflow prevention assemblies installed on premises? ☐ Yes ☐ No
Have the assemblies been installed in accordance with State Rules? ☐ Yes ☐ No
Are copies of annual tests available? ☐ Yes ☐ No
Recommendations or Remarks:
Signature of Investigator: _____ Date: _____
Signature of Property Owner: _____ Date: _____

Exhibit E – Backflow Assembly Tester Pre-Approved List

Backflow Assembly Tester Pre-Approved List

The following table lists Backflow Assembly Testers (BATs) that are pre-approved to test backflow assemblies in our water system's service area.

Note: listing does not constitute an endorsement of these BATs by our system or a certification of the quality of services they provide.

To appear on our pre-approved BAT list, the tester must:

- Show proof of current BAT certification from DOH;
- Submit documentation that his/her assembly test equipment has been verified for accuracy within the last 12 months and calibrated if needed; and

As an alternative to the above, pre-approved testers must appear on the approved BAT list of another nearby water system that has a testing QA/QC program acceptable to the District.

WAC 246-290-490 requires a DOH-certified BAT to test all assemblies (RPBA, RPDA, DCVA, etc.) that protect the distribution system. Assemblies that protect the public water system must be tested in accordance with DOH-approved field test procedures:

- Upon installation, and annually thereafter;
- After repair, reinstallation, or relocation; and
- After a backflow incident.

Note: the DOH BAT certification is a special certification separate from other waterworks operator certification categories, plumbing licenses, contractor registration, etc. Other licenses, certifications and/or registrations may be required to install backflow prevention assemblies and/or perform maintenance work on assemblies within buildings. **However, only a currently DOH-certified BAT may test the assemblies that protect the public water system from contamination.**

Name of Tester	Phone Number	BAT Certificate Number

Exhibit F – Backflow Assembly Test Inspection Report

Backflow Assembly Test Report

☐ Exiting ☐ Replaced
☐ New ☐ Removed

NAME OF PREMISES: _____ ☐Commercial ☐Residential

MAILING ADDRESS: _____

CITY: _____ ZIP: _____

CONTACT PERSON: _____

PHONE: _____

ADDRESS OF ASSEMBLY: _____

	Double Check Valve	Reduced Pressure. Assembly	PVBA	SVBA
INITIAL TEST RESULTS PASS ☐ FAILED ☐	Check Valve #1 Leaked ☐ Tight ☐ _____ PSI Check Valve #2 Leaked ☐ Tight ☐ _____ PSI	#1 Check Pressure Drop _____ (A) Relief Valve Opened _____ (B) Buffer A-B= _____ (Min 3 PSI	Pressure Drop _____ PSID	Pressure Drop: _____ PSID
Comments/ Repairs/ Parts:				
FINAL TEST RESULTS PASS ☐ FAILED ☐	Check Valve #1 Leaked ☐ Tight ☐ _____ PSI Check Valve #2 Leaked ☐ Tight ☐ _____ PSI	#1 Check Pressure Drop _____ (A) Relief Valve Opened _____ (B) Buffer A-B= _____ (Min 3 PSI	Opened At: _____ PSID #1 Check _____ PSID	Opened At: _____ PSID #1 Check Valve: _____ PSID

☐NEW INSTALLATION ☐EXISTING ☐REPLACEMENT

SIZE: ___ ___.___ ___. MAKE: _____ MODEL: _____

SERIAL NUMBER: _____ ASSEMBLY LOCATION: _____

In completing and submitting this test report, the tester certifies that the assembly has been tested and maintained in accordance with all applicable rules and regulations or the water system and Washington State.

Gauge Calibration Date ____/____/____ Detector Meter Reading _____

Tester Signature

Certification Number

Tester Name Printed

Gauge Number

Tester Address

Phone Number

Cross Connection Control Program – North Beach Water District

Exhibit G-1 – Backflow Assembly Typical Installation Detail

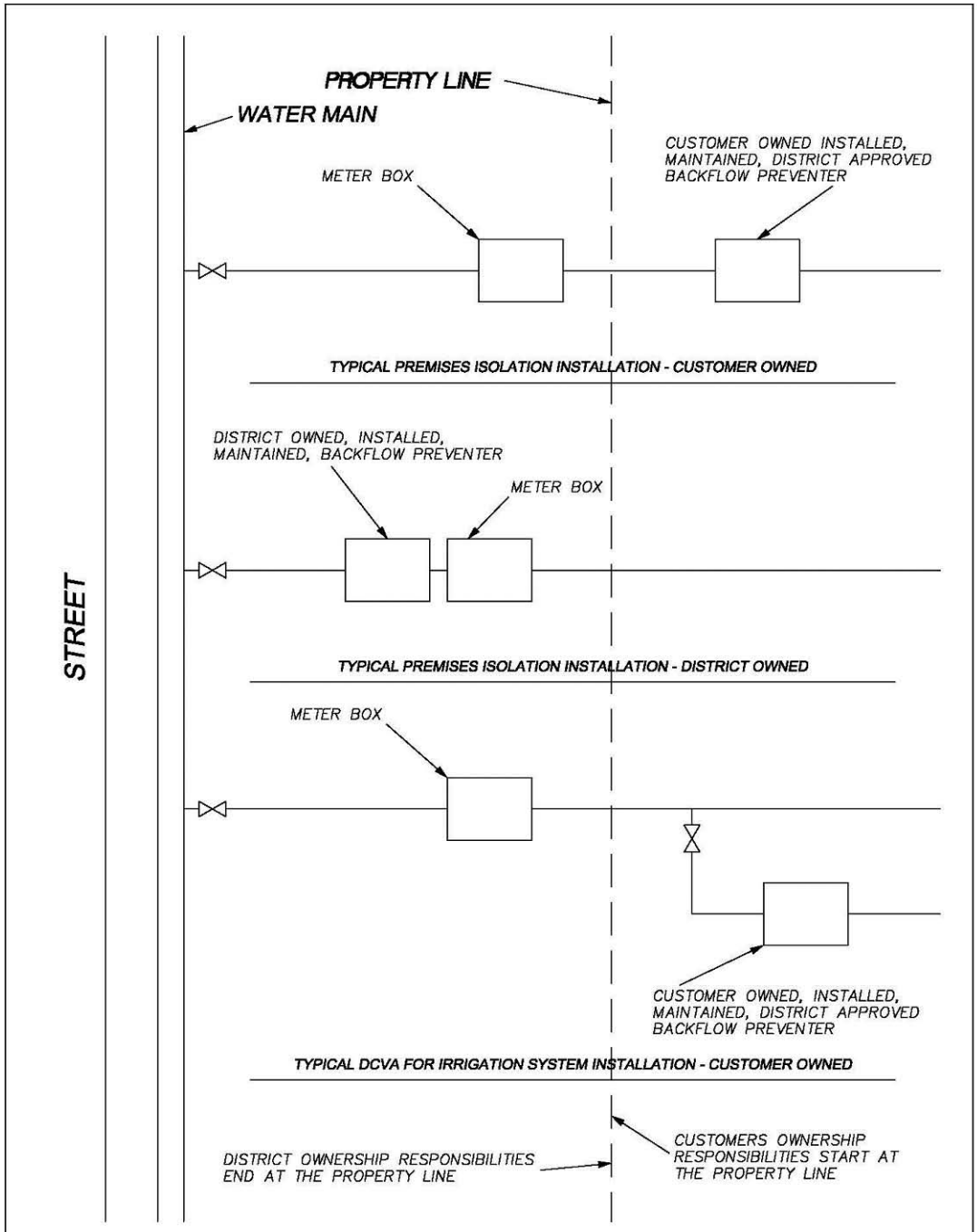
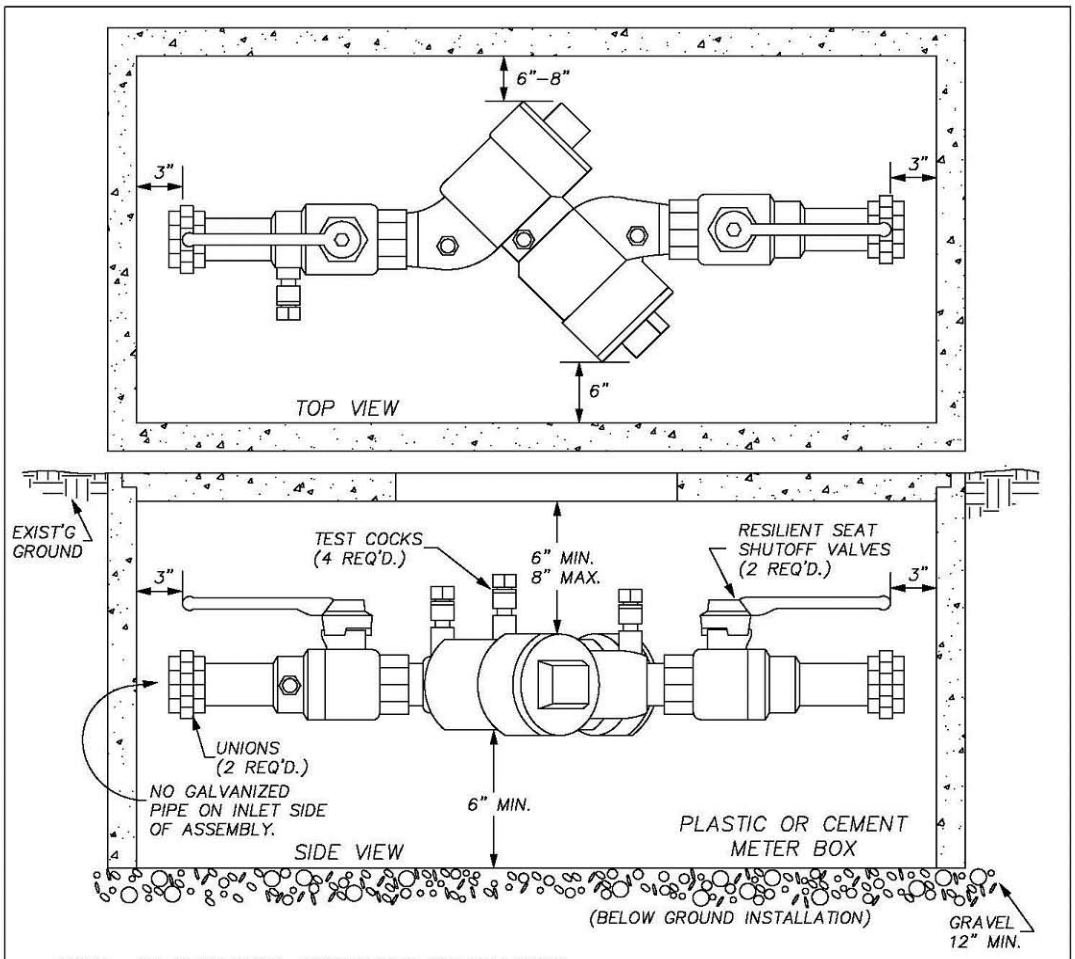


Exhibit G-2 –Installation Detail - DCVA



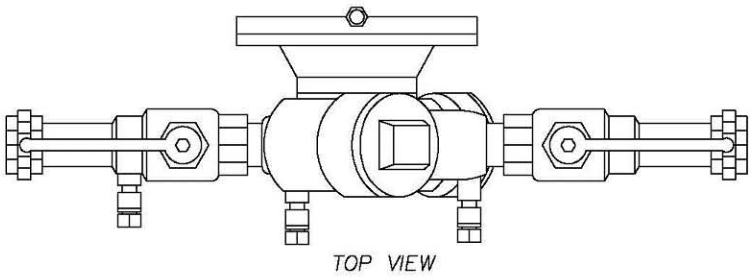
NOTE: ALL ITEMS SHALL COMPLY WITH THE FOLLOWING.

- APPROVED DOUBLE CHECK VALVE ASSEMBLY SHALL LAY HORIZONTAL WITH GROUND.
- DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
- THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACK FLOW PREVENTER
- NO GALVANIZED PIPE BEFORE ASSEMBLY
- THE DCVA MAY BE INSTALLED ABOVE OR BELOW THE GROUND PROVIDED ALL CLEARANCES ARE MET.
- DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING OR HIGH GROUND WATER.
- VALVE SHALL BE PROTECTED FROM FREEZING CONDITIONS, AND PROVIDE ELECTRICAL CONNECTION.
- THE BACK FLOW ASSEMBLY SHALL BE A MODEL CURRENTLY APPROVED BY THE WASHINGTON STATE DEPARTMENT OF HEALTH
- INSTALLATIONS LARGER THAN 2 INCH SHALL BE APPROVED ON DESIGN SUBMITAL.

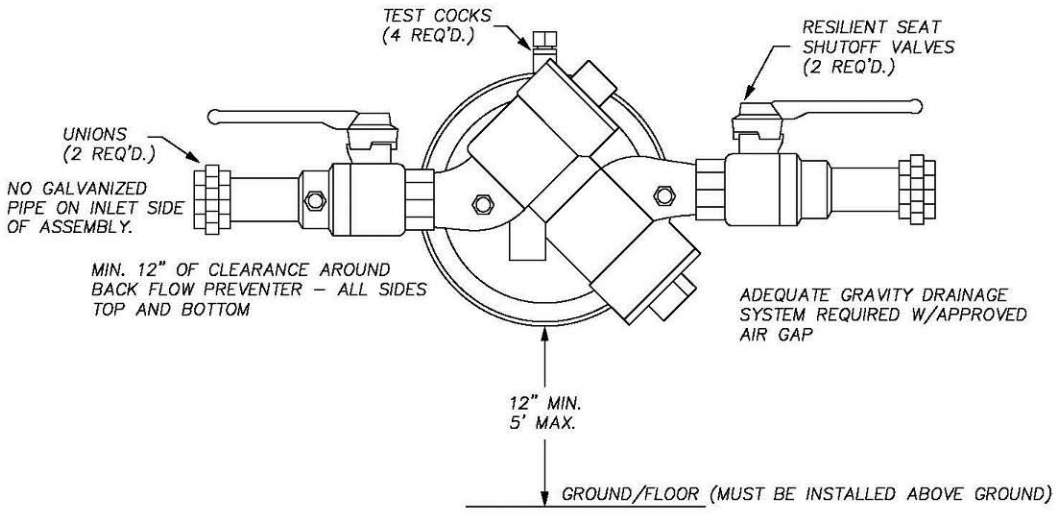
APPROVED BY	REVISED DATE	NORTH BEACH WATER DISTRICT	EXHIBIT NO.
DISTRICT MANAGER	1/9/2012	DOUBLE CHECK VALVE ASSEMBLY 2" & SMALLER	I–b

I–b.DWG

Exhibit G-3 –Installation Detail - RPBA



TOP VIEW



SIDE VIEW

NOTE: ALL ITEMS SHALL COMPLY WITH THE FOLLOWING.

- APPROVED REDUCED PRESSURE BACK FLOW ASSEMBLY SHALL LAY HORIZONTAL ONLY.
- DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
- THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACK FLOW PREVENTER.
- DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING OR HIGH GROUND WATER.
- NO GALVANIZED PIPE BEFORE ASSEMBLY
- VALVE SHALL BE PROTECTED FROM FREEZING CONDITIONS, AND PROVIDE ELECTRICAL CONNECTION.
- THE BACK FLOW ASSEMBLY SHALL BE A CURRENT WASHINGTON STATE DEPARTMENT OF HEALTH APPROVED MODEL.
- INSTALLATIONS LARGER THAN 2 INCH AND BELOW GRADE WILL BE APPROVED ON DESIGN SUBMITTAL.

(ABOVE GROUND INSTALLATION)

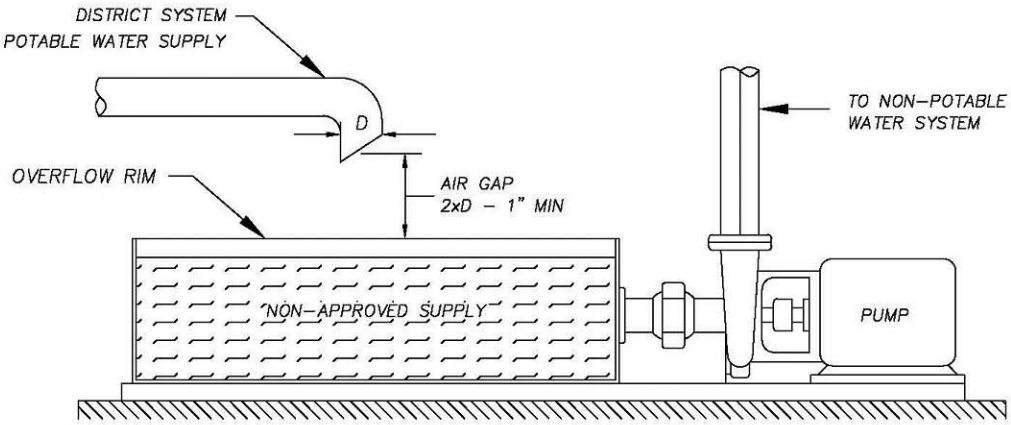
APPROVED BY	REVISED DATE	NORTH BEACH WATER DISTRICT	EXHIBIT NO.
GENERAL MANAGER	1/10/2012	REDUCED PRESSURE BACK FLOW ASSEMBLY– 2" & SMALLER	I–c

I–c.DWG

Exhibit G-4 –Installation Detail – Air Gap

APPROVED AIR GAP SEPARATION

AN APPROVED AIR GAP IS A PHYSICAL SEPARATION BETWEEN THE FREE FLOWING DISCHARGE END OF A POTABLE WATER SUPPLY PIPELINE AND THE OVERFLOW RIM OF AN OPEN OR NON–PRESSURE RECEIVING VESSEL. THESE VERTICAL, PHYSICAL SEPARATIONS MUST BE AT LEAST TWICE THE DIAMETER OF THE INLET PIPE BUT NEVER LESS THAN ONE INCH. IF SPLASHING IS A PROBLEM, TUBULAR SCREENS MAY BE ATTACHED OR THE SUPPLY LINE OUTLET MAY BE CUT AT A 45 DEGREE ANGLE. IF SUPPLY LINE IS CUT AT A 45 DEGREE ANGLE THE AIR GAP DISTANCE IS MEASURED FROM THE CENTER OF THE ANGLE. HOSES ARE NOT ALLOWED. BYPASSES ARE NOT ALLOWED. THE INSPECTION OF AIR GAPS SHALL BE INCLUDED IN THE YEARLY TESTING PROGRAM FOR BACKFLOW DEVICES.



APPROVED BY	REVISED DATE	NORTH BEACH WATER DISTRICT	EXHIBIT NO.
DISTRICT MANAGER	1/9/2012	AIR GAP SEPARATION	I–d

I–d.DWG

Exhibit G-5 –Installation Detail – PVBA/SVBA

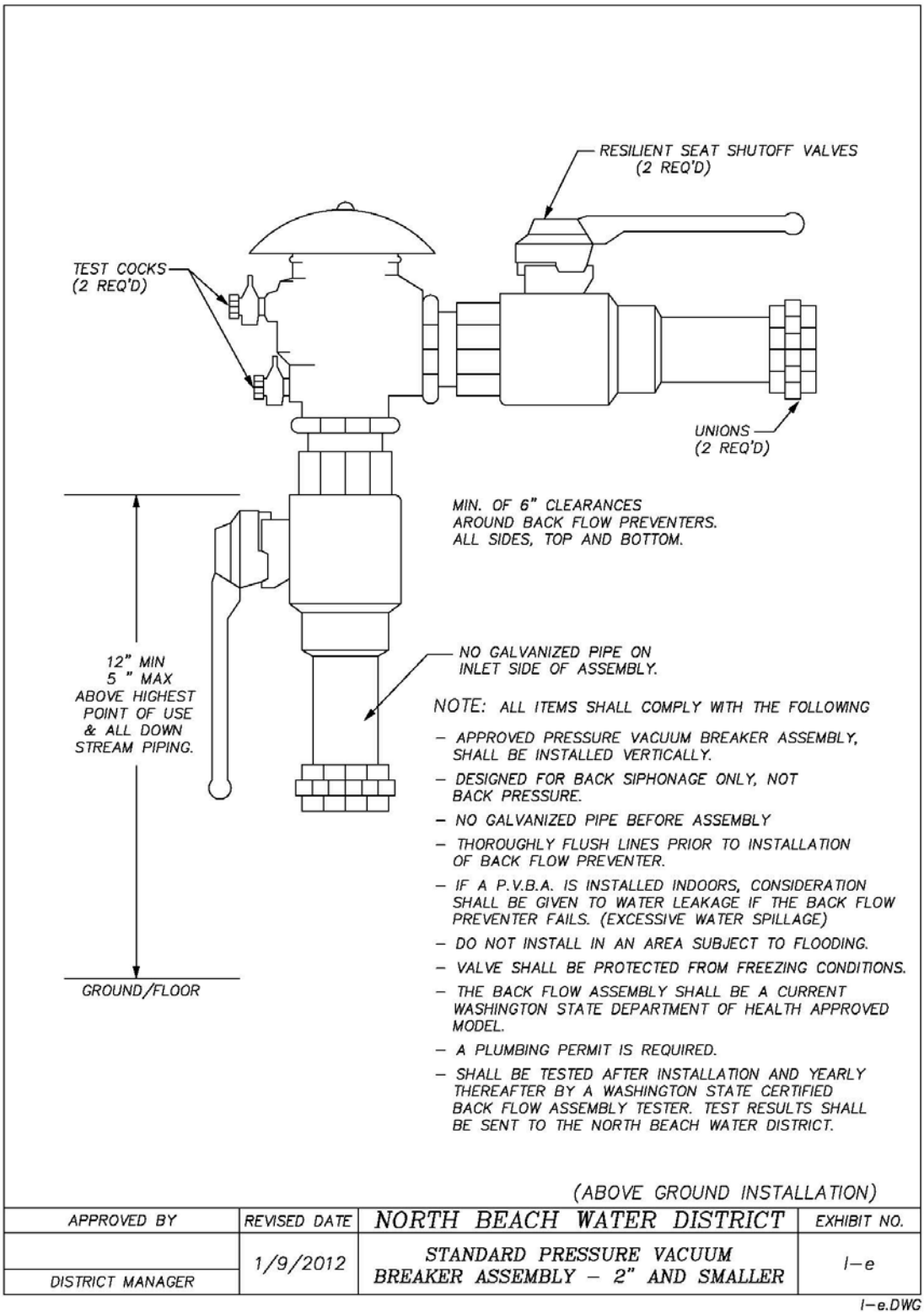


Exhibit H –Backflow Incident Response Plan

North Beach Water District
Backflow Incident Response Plan

General

This Backflow Incident Response Plan should be considered a supplement to the North Beach Water District’s Emergency Plan.

The Districts responsible operator in charge should immediately begin a backflow incident investigation whenever the initial evaluation of a water quality complaint indicates that:

1. A backflow incident has occurred (i.e., drinking water supply has been contaminated) or may have occurred; or
2. The complaint can’t be explained as a "normal" aesthetic problem.

Also, whenever a water main break (or power outage for pumped systems) causes a widespread loss of water pressure in the system (creating backsiphonage conditions), purveyors should initiate a check of distribution system water quality as a precursor to the need for a backflow incident investigation.

WAC 246-290-490 requires purveyors to notify DOH, the Local Administrative Authority and local health jurisdiction as soon as possible, but no later than the end of the next business day when a backflow incident contaminates the potable water supply (in the distribution system and/or in the customer's plumbing system). Purveyors should include a list of emergency contact telephone numbers at the beginning of the water system’s O & M Manual, so that the information is readily available when an incident occurs.

The backflow incident investigation will be a team effort. The investigation will be made by or initially led by the General Manager and the DOH-certified Cross-Connection Control Specialist employed by the District. The investigation team may include DOH ODW (regional) staff and Pacific County Community Development personnel.

The District will rely on the Backflow Incident Investigation Procedures manual, published by the Pacific Northwest Section, American Water Works Association (PNWS-AWWA) for guidance on how to respond to a backflow incident.

Short List of Tasks

The District will use the following short list of tasks as initial guidance for dealing with backflow incidents. The District's investigation team will consult the most recently published edition of the PNWS-AWWA Backflow Incident Investigation Procedures Manual referenced above for greater detail as soon as possible after learning of a possible or confirmed backflow incident. Note: the District is referred to as the Purveyor in the short task list.

1. Customer Notification

    a. As soon as possible, the Purveyor will notify customers not to consume or use water.

    b. The Purveyor will start the notification with the customers nearest in location to the assumed source of contamination (usually the customer(s) making the water quality complaint).

    c. The Purveyor will inform the customer about the reason for the backflow incident investigation and the Purveyor's efforts to restore water quality as soon as possible. The Purveyor will let the customer know that customers will be informed when they may use water, the need to boil water used for consumption until a satisfactory bacteriological test result is obtained from the lab, etc.

    d. Where a customer cannot be contacted immediately, the Purveyor will place a written notice on the front door handle, and a follow-up visit will be made to confirm that the customer received notice about the possible contamination of the water supply.

    e. When dealing with a backflow incident, the Purveyor will let customers know that it could take several days to identify the source and type of contaminant(s) and to clean and disinfect the distribution system.

2. Identification of Source of Contamination

    a. The Purveyor will give consideration to the distribution system as a potential source of the contaminant (e.g., air valve inlet below ground).

    b. The Purveyor will not start flushing the distribution system until the source of contamination is identified (flushing may aggravate the backflow situation, and will likely remove the

contaminant before a water sample can be collected to fully identify the contaminant).

c. The Purveyor will conduct a house-to-house survey to search for the source of contamination and the extent that the contaminant has spread through the distribution system. The Purveyor will check water meters that show a return of water (meter running backward) to the distribution system.

d. When the cross connection responsible for the system contamination is located, the Purveyor should discontinue water service to that customer, until the customer completes the corrective action ordered by the Purveyor.

3. Isolation of Contaminated Portion of System

a. The Purveyor will isolate the portions of the system that are suspected of being contaminated by closing isolating valves; leave one valve open to ensure that positive water pressure is maintained throughout the isolated system.

b. The Purveyor will be sure to notify all affected customers in the isolated area first and then notify other customers served by the system.

4. Public Health Impacts

a. The Purveyor will seek immediate input from and work with state and local health agencies to accurately communicate and properly mitigate potential health effects resulting from the backflow incident.

b. If appropriate, the Purveyor will refer customers that may have consumed the contaminant or had their household (or commercial) plumbing systems contaminated to public health personnel and Local Administrative Authorities (plumbing inspectors).

5. Cleaning/Disinfecting the Distribution System

a. The Purveyor will develop and implement a program for cleaning the contaminated distribution system consistent with the contaminant(s) identified.

b. Where both chemical and bacteriological contamination has occurred, the Purveyor will disinfect the system after the removal of the chemical contaminant.

c. Where any bacteriological contamination is suspected, the Purveyor will provide field disinfection.

Additional Information on Cleaning/Disinfecting the Distribution System

Most chemical or physical contaminants can be flushed from the water distribution system or customer's plumbing system with adequate flushing velocity. However, this may not be the case in systems where scale and corrosion deposits (e.g., tuberculation on old cast iron mains) provide a restriction to obtaining adequate flushing velocity, or where chemical deposits or bacteriological slimes (biofilm) are present (on which the chemical contaminant may adhere).

To remove a chemical or physical contaminant from the distribution system, purveyors may need to:

1. Physically clean the affected area using foam swabs (pigs); and/or
2. Alter the form of the chemical contaminant (e.g., through oxidation using chlorination or addition of detergents).

When adding any chemical (including chlorine) to remove a contaminant from the distribution system, it is essential that the District's Operator's fully understand the chemistry of the contaminant. **Adding the wrong chemical could make the contaminant more toxic to customers and/or more difficult to remove from the distribution system.**

To disinfect water mains using the "slug" or "continuous flow" method, a field unit should be used for chlorine injection, such as a chemical feed - metering or proportioning pump for sodium hypochlorite. The District will contact the DOH regional ODW to discuss proposed approaches to contaminant removal and disinfection prior to taking corrective action.

Exhibit I –Backflow Incident Report

Backflow Incident Report Form

Report Date:		
Reported By:	Title:	
Date of Incident:	Time of Incident	
Location of Incident (General):		
Backflow Originated From (Name of Premises):		
Street Address (Originating Premises):		
Contact Person (Originating Premises):	Phone#:	
Type of Business (Originating Premises):		
Describe Contaminates (Attach Chemical Analysis or MSDS Sheets):		
First:		
Second:		
Third:		
Was Contaminants Contained within Customers Premises? Yes: ☐ No ☐		
Effect of Contamination:	Illness Reported:	Physical Irritations Reported:
Fatalities:	Number of People Affected by the Incident:	
Cross-Connection Source of Contaminant (boiler, chemical pump, irrigation system, etc.):		
Cause of Backflow (main break, fire flow, etc.):		
Corrective Action Taken to Restore Water Quality (main flushing, disinfection, etc.):		

Continued on Back

Corrective Action Ordered by DOH (main flushing, disinfection, etc.):	
Previous Cross Connection Survey of Premises:	Date:
By:	CCS Cert. Number:
Types of Backflow Preventer Isolating Premises:	
RPBA:☐ RPDA:☐ DCVA:☐ DCDA:☐ PVBA:☐ SVBA:☐ AVB:☐ Air Gap:☐ None:☐	
Other:☐ Describe:	
Date Backflow Preventer was Last Tested: (most recent):	
Notification to the Washington State Department of Health:	
Date:	Time:
Name of DOH Representative Notified:	
Method of Notification:	
Name of Person who Notified the DOH Representative:	
Name of the Person Completing this Report:	
Title of the Person Completing this Report:	
Signature of the Person Completing this report:	_
Date:	_____

Notes/Sketches:

Attach sheets with additional information, sketches, and/or media information.

Exhibit J –Backflow Preventer Agreement

Backflow Preventer Assistance Agreement

This agreement between North Beach Water District (District), a special purpose district, and _____ a real property owner (Owner)

WHEREAS, the Owner owns real property legally described on Exhibit "A" attached hereto and incorporated herein by this reference (Property), and

WHEREAS, the District supplies potable water to the Property through its water system's distribution system, and

WHEREAS, the an actual or potential cross connection exists on the Property that requires the Property to be isolated from the distribution system by a Washington State Department of Health approved backflow preventer, and

WHEREAS, the District, as a service to its ratepayers and according to an established fee schedule, installs; maintains; tests; repairs; and replaces as needed, District owned backflow preventers in accordance with the District's rules and regulations and all applicable federal, state, and local laws, codes, and ordinances; and

WHEREAS, the Owner desires to have the District install; maintain; test; repair; and replace as needed, a District owned backflow preventer that is approved by the Washington State Department of Health and installed in accordance with District rules and regulations and applicable laws, codes, and ordinances;

NOW THEREFORE, in consideration of the terms and conditions herein stated, the District and the Owner agree as follows:

1. District agrees to install a _____ -inch backflow preventer along with all appurtenances and to have the backflow preventer tested by a Washington State Department of Health certified Backflow Assembly Tester within 30 days of the execution of this agreement.
2. The District agrees to have the backflow preventer tested annually by a Washington State Department of Health certified Backflow Assembly Tester and report the results of the test to the Owner within 30 days of the completion of the test.
3. In the event the backflow preventer fails the test, the District agrees it will, at its discretion, repair or replace the backflow preventer and retest the backflow preventer within 30 days of the failed test and repeat this procedure until the backflow preventer passes the test.

4. The Owner agrees to pay the BPAP service fee of $_____ per month to the District for as long as the Owner owns the Property and the backflow preventer is providing premises isolation for the Property.

5. The Owner agrees that the current BPAP service fee is established in a rate schedule approved by the District's Board of Commissioners (Board) and that the Board may amend the rate schedule at any time without notice.

6. The Owner agrees to release, waive, discharge and hold harmless the District, its officers, commissioners, agents, servants, representatives and employees from any and all liability, claims, demands, actions, and causes of action whatsoever arising out of or related to any loss, damage, or injury, including death, that may be sustained by Owner or any of the property owned by Owner as a result of Owner's participation in the backflow prevention program and the installation of a backflow prevention device. Owner further understands that by entering into this Agreement in no way implies liability by the District for any injury or property damage sustained by Owner as a result of any prior or future sanitary sewer backup.

7. This agreement shall be binding upon the undersigned and their respective heirs, executors, administrators, successors, transferees, assigns, agents, and attorneys.

8. Owner and District may terminate this agreement with 30 days' written notice. Upon termination of this Agreement the District will remove the backflow preventer and all appurtenances isolating the Property from the water system. If the actual or potential cross connection still exists on the Property the Owner will isolate the Property by installing, maintaining, and testing a Washington State Department of Health approved backflow preventer in accordance with North Beach Water District rules and regulations.

9. Upon execution, this Agreement shall be returned to North Beach Water District and the District shall cause the executed original of this agreement to be recorded with the Pacific County Auditor against the real property described in Exhibit "A" referred to above.

DATED this _____ day of _____, 20_____.

North Beach Water District:

By: _____
William Neal, General Manager

Owner:

By: _____
Name:

By: _____
Name:

APPENDIX J

DETAILED COST ESTIMATES

North Beach Water District
Project Cost Estimate

12/18/2014

2014 WSP D-01 Water Main Replacement and Loop. 245th Lane, U St. to Birch Pl.

Items	Quantity	Estimated Cost	Total Estimated
Trench Excavation Safety Systems	1	$ 500.00	$ 500
Erosion Control	1	$ 500.00	$ 500
Locate Existing Utilities	1	$ 250.00	$ 250
8-inch Water Pipe, Including Fittings	1900	$ 35.00	$ 66,500
Additional Pipe Fittings	550	$ 2.75	$ 1,513
8-inch Gate Valves	12	$ 950.00	$ 11,400
Fire Hydrants	3	$ 2,800.00	$ 8,400
Service Connections	10	$ 450.00	$ 4,500
Sample Stations	1	$ 1,250.00	$ 1,250
Gravel Backfill	0	$ 12.00	$ -
Foundation Gravel	20	$ 35.00	$ 700
Asphalt Concrete Pavement Repair	10	$ 210.00	$ 2,100
Cold Mix Asphalt	0	$ 200.00	$ -
Crushed Surfacing, Top Course	120	$ 15.00	$ 1,800
Surface Restoration	1360	$ 5.50	$ 7,480
Labor Burden For District Crew (budgeted)	480	$ 120.00	$ 57,600
			$ 164,493

Subtotal	**$**	**164,493**
Sales Tax - 7.8%	**$**	**8,240**
Contingency - Add 15%	**$**	**24,674**
Engineering Cost	**$**	**31,583**
ROW or Easement Acquisition	**$**	**-**
Total	**$**	**228,989**
Say:	**$**	**223,000**

North Beach Water District
Project Cost Estimate

12/18/2014

2014 WSP D-02 Install Fire Hydrant Lommis Lake State Park

Items	Quantity	Estimated Cost	Total Estimated
8-inch Water Pipe, Including Fittings	20	$ 35.00	$ 700
Additional Pipe Fittings	100	$ 2.75	$ 275
8-inch Gate Valves	2	$ 950.00	$ 1,900
Fire Hydrants	1	$ 2,800.00	$ 2,800
Service Connections	0	$ 450.00	$ -
Sample Stations	1	$ 1,250.00	$ 1,250
Gravel Backfill	10	$ 12.00	$ 120
Foundation Gravel	0	$ 35.00	$ -
Asphalt Concrete Pavement Repair	0	$ 210.00	$ -
Cold Mix Asphalt	0	$ 200.00	$ -
Crushed Surfacing, Top Course	0	$ 15.00	$ -
Surface Restoration	0	$ 2.75	$ -
Labor Burden For District Crew	8	$ 120.00	$ 960
			$ 8,005

Subtotal	**$**	**8,005**
Sales Tax - 7.8%	**$**	**540**
Contingency - Add 15%	**$**	**1,201**
Engineering Cost	**$**	**1,537**
ROW or Easement Acquisition	**$**	**-**
Total	**$**	**11,283**
Say:	**$**	**12,000**

North Beach Water District
Project Cost Estimate

12/18/2014

2014 WSP D-03 Reloace Water Service to Public ROW. (Free by the Sea)

Items	Quantity	Estimated Cost	Total Estimated
Trench Excavation Safety Systems	1	$ 500.00	$ 500
Erosion Control	1	$ 500.00	$ 500
Locate Existing Utilities	1	$ 250.00	$ 250
6-inch Water Pipe, Including Fittings	40	$ 30.00	$ 1,200
Additional Pipe Fittings	1000	$ 2.75	$ 2,750
6-inch Gate Valves	3	$ 650.00	$ 1,950
Fire Hydrants	1	$ 2,800.00	$ 2,800
Service Connections	1	$ 2,500.00	$ 2,500
Sample Stations	0	$ 1,250.00	$ -
Gravel Backfill	10	$ 12.00	$ 120
Foundation Gravel	10	$ 35.00	$ 350
Asphalt Concrete Pavement Repair	0	$ 210.00	$ -
Surface Restoration	0	$ 2.75	$ -
Labor Burden For District Crew	44	$ 120.00	$ 5,280
			$ 18,200

Subtotal	**$**	**18,200**
Sales Tax - 7.8%	**$**	**910**
Contingency - Add 25%	**$**	**4,550**
Engineering Cost	**$**	**5,460**
ROW or Easement Acquisition	**$**	**-**
Total	**$**	**29,120**
Say:	**$**	**30,000**

North Beach Water District **12/18/2014**
Project Cost Estimate

2014 WSP D-04 - Install 20 New Water Sample Stations

Items	Quantity	Estimated Cost	Total Estimated
Trench Excavation Safety Systems	0	$ -	$ -
Erosion Control	0	$ -	$ -
Locate Existing Utilities	0	$ -	$ -
Sample Stations	20	$ 1,450.00	$ 29,000
Gravel Backfill	0	$ -	$ -
Foundation Gravel	0	$ -	$ -
Asphalt Concrete Pavement Repair	0	$ -	$ -
Surface Restoration	0	$ -	$ -
Labor Burden For District Crew	80	$ 120.00	$ 9,600
			$ -
			$ -
			$ -
			$ -
			$ -
			$ -
			$ 38,600

Subtotal	**$**	**38,600**
Sales Tax - 7.8%	**$**	**2,262**
Contingency - Add 10%	**$**	**3,860**
Engineering Cost	**$**	**-**
ROW or Easement Acquisition	**$**	**-**
Total	**$**	**44,722**
Say:	**$**	**45,000**

North Beach Water District **12/18/2014**
Project Cost Estimate

2014 WSP D-05 Water Main Replacement and Loop. Ash and Birch from 250th to 240th (Rushlight). Eliminate Hogback line.

Items	Quantity	Estimated Cost	Total Estimated
Trench Excavation Safety Systems	1	$ 500.00	$ 500
Erosion Control	1	$ 500.00	$ 500
Locate Existing Utilities	1	$ 250.00	$ 250
8-inch Water Pipe, Including Fittings	2700	$ 35.00	$ 94,500
Additional Pipe Fittings	800	$ 2.75	$ 2,200
8-inch Gate Valves	4	$ 950.00	$ 3,800
Fire Hydrants	3	$ 2,800.00	$ 8,400
Service Connections	36	$ 450.00	$ 16,200
Sample Stations	1	$ 1,250.00	$ 1,250
Gravel Backfill	300	$ 12.00	$ 3,600
Foundation Gravel	20	$ 35.00	$ 700
Asphalt Concrete Pavement Repair	30	$ 210.00	$ 6,300
Cold Mix Asphalt	30	$ 200.00	$ 6,000
Crushed Surfacing, Top Course	120	$ 15.00	$ 1,800
Surface Restoration	1730	$ 2.75	$ 4,758
Labor Burden For District Crew	770	$ 120.00	$ 92,400
			$ -
			$ 243,158

Subtotal	**$**	**243,158**
Sales Tax - 7.8%	**$**	**11,662**
Contingency - Add 15%	**$**	**36,474**
Engineering Cost	**$**	**46,200**
ROW or Easement Acquisition	**$**	**-**
Total	**$**	**337,493**
Say:	**$**	**338,000**

North Beach Water District
Project Cost Estimate

12/18/2014

2014 WSP D-06 Water Main Replacement Tides West Division 1 and Jolly Roger.

Items	Quantity	Estimated Cost	Total Estimated
Trench Excavation Safety Systems	1	$ 500.00	$ 500
Erosion Control	1	$ 500.00	$ 500
Locate Existing Utilities	1	$ 250.00	$ 250
6-inch Water Pipe, Including Fittings	4650	$ 30.00	$ 139,500
Additional Pipe Fittings	1800	$ 2.75	$ 4,950
6-inch Gate Valves	12	$ 650.00	$ 7,800
Fire Hydrants	6	$ 2,800.00	$ 16,800
Service Connections	100	$ 450.00	$ 45,000
Sample Stations	2	$ 1,250.00	$ 2,500
Gravel Backfill	450	$ 12.00	$ 5,400
Foundation Gravel	40	$ 35.00	$ 1,400
Asphalt Concrete Pavement Repair	45	$ 210.00	$ 9,450
Cold Mix Asphalt	0	$ 200.00	$ -
Crushed Surfacing, Top Course	270	$ 15.00	$ 4,050
Surface Restoration	2350	$ 2.75	$ 6,463
Labor Burden For District Crew (budgeted)	960	$ 60.00	$ 57,600
Labor Burden for District Crew (not budgeted)	960	$ 50.00	$ 48,000
			$ 350,163

Subtotal	**$**	**350,163**
Sales Tax - 7.8%	**$**	**18,978**
Contingency - Add 15%	**$**	**52,524**
Engineering Cost	**$**	**66,531**
ROW or Easement Acquisition	**$**	**-**
Total	**$**	**488,196**
Say:	**$**	**490,000**

North Beach Water District **12/18/2014**
Project Cost Estimate

2014 WSP D-07 Water Main Replacement Tides West Division 2 and Sea Lake Ranch

Items	Quantity	Estimated Cost	Total Estimated
Trench Excavation Safety Systems	1	$ 500.00	$ 500
Erosion Control	1	$ 500.00	$ 500
Locate Existing Utilities	1	$ 250.00	$ 250
6-inch Water Pipe, Including Fittings	4770	$ 30.00	$ 143,100
Additional Pipe Fittings	1600	$ 2.75	$ 4,400
6-inch Gate Valves	10	$ 650.00	$ 6,500
Fire Hydrants	6	$ 2,800.00	$ 16,800
Service Connections	80	$ 450.00	$ 36,000
Sample Stations	2	$ 1,250.00	$ 2,500
Gravel Backfill	450	$ 12.00	$ 5,400
Foundation Gravel	40	$ 35.00	$ 1,400
Asphalt Concrete Pavement Repair	45	$ 210.00	$ 9,450
Cold Mix Asphalt	0	$ 200.00	$ -
Crushed Surfacing, Top Course	270	$ 15.00	$ 4,050
Surface Restoration	2400	$ 2.75	$ 6,600
Labor Burden For District Crew (budgeted)	890	$ 120.00	$ 106,800
			$ -
			$ 344,250

Subtotal	**$**	**344,250**
Sales Tax - 7.8%	**$**	**18,424**
Contingency - Add 15%	**$**	**51,638**
Engineering Cost	**$**	**65,408**
ROW or Easement Acquisition	**$**	**-**
Total	**$**	**479,719**
Say:	**$**	**480,000**

North Beach Water District **12/18/2014**
Project Cost Estimate

2014 WSP D-08 Install Water Main Loop - Vernon Ave. 276th to Joe Johns Rd

Items	Quantity	Estimated Cost	Total Estimated
Trench Excavation Safety Systems	1	$ 500.00	$ 500
Erosion Control	1	$ 500.00	$ 500
Locate Existing Utilities	1	$ 250.00	$ 250
8-inch Water Pipe, Including Fittings	3500	$ 35.00	$ 122,500
Additional Pipe Fittings	1005	$ 2.75	$ 2,764
8-inch Gate Valves	13	$ 950.00	$ 12,350
Fire Hydrants	4	$ 2,800.00	$ 11,200
Service Connections	8	$ 450.00	$ 3,600
Sample Stations	1	$ 1,250.00	$ 1,250
Gravel Backfill	300	$ 12.00	$ 3,600
Foundation Gravel	40	$ 35.00	$ 1,400
Asphalt Concrete Pavement Repair	25	$ 210.00	$ 5,250
Cold Mix Asphalt	0	$ 200.00	$ -
Crushed Surfacing, Top Course	250	$ 15.00	$ 3,750
Surface Restoration	2500	$ 2.75	$ 6,875
Labor Burden For District Crew	870	$ 120.00	$ 104,400
			$ -
			$ 280,189

Subtotal	**$**	**280,189**
Sales Tax - 7.8%	**$**	**13,614**
Contingency - Add 15%	**$**	**42,028**
Engineering Cost	**$**	**53,236**
ROW or Easement Acquisition	**$**	**-**
Total	**$**	**389,067**
Say:	**$**	**390,000**

North Beach Water District **12/18/2014**
Project Cost Estimate

2014 WSP D-09 Install Water Main Loop - Joe Johns Rd. & U St. to 270th

Items	Quantity	Estimated Cost	Total Estimated
Trench Excavation Safety Systems	1	$ 500.00	$ 500
Erosion Control	1	$ 500.00	$ 500
Locate Existing Utilities	1	$ 250.00	$ 250
8-inch Water Pipe, Including Fittings	3500	$ 35.00	$ 122,500
Additional Pipe Fittings	1005	$ 2.75	$ 2,764
8-inch Gate Valves	13	$ 950.00	$ 12,350
Fire Hydrants	4	$ 2,800.00	$ 11,200
Service Connections	8	$ 450.00	$ 3,600
Sample Stations	1	$ 1,250.00	$ 1,250
Gravel Backfill	300	$ 12.00	$ 3,600
Foundation Gravel	40	$ 35.00	$ 1,400
Asphalt Concrete Pavement Repair	25	$ 210.00	$ 5,250
Cold Mix Asphalt	0	$ 200.00	$ -
Crushed Surfacing, Top Course	250	$ 15.00	$ 3,750
Surface Restoration	2500	$ 2.75	$ 6,875
Labor Burden For District Crew	870	$ 120.00	$ 104,400
			$ -
			$ 280,189

Subtotal	**$**	**280,189**
Sales Tax - 7.8%	**$**	**13,614**
Contingency - Add 15%	**$**	**42,028**
Engineering Cost	**$**	**53,236**
ROW or Easement Acquisition	**$**	**-**
Total	**$**	**389,067**
Say:	**$**	**390,000**

North Beach Water District **12/18/2014**
Project Cost Estimate

2014 WSP D-10 Install Water Main Loop - Joe Johns & Sandridge to 275th

Items	Quantity	Estimated Cost	Total Estimated
Trench Excavation Safety Systems	1	$ 500.00	$ 500
Erosion Control	1	$ 500.00	$ 500
Locate Existing Utilities	1	$ 250.00	$ 250
8-inch Water Pipe, Including Fittings	8100	$ 35.00	$ 283,500
Additional Pipe Fittings	2500	$ 2.75	$ 6,875
8-inch Gate Valves	15	$ 950.00	$ 14,250
Fire Hydrants	9	$ 2,800.00	$ 25,200
Service Connections	30	$ 450.00	$ 13,500
Sample Stations	2	$ 1,250.00	$ 2,500
Gravel Backfill	800	$ 12.00	$ 9,600
Foundation Gravel	80	$ 35.00	$ 2,800
Asphalt Concrete Pavement Repair	60	$ 210.00	$ 12,600
Cold Mix Asphalt	0	$ 200.00	$ -
Crushed Surfacing, Top Course	350	$ 15.00	$ 5,250
Surface Restoration	5500	$ 2.75	$ 15,125
Labor Burden For District Crew	1200	$ 120.00	$ 144,000
			$ -
			$ 536,450

Subtotal	**$**	**536,450**
Sales Tax - 7.8%	**$**	**30,514**
Contingency - Add 15%	**$**	**80,468**
Engineering Cost	**$**	**101,926**
ROW or Easement Acquisition	**$**	**-**
Total	**$**	**749,357**
Say:	**$**	**750,000**

North Beach Water District
Project Cost Estimate

12/18/2014

2014 WSP D-11 Install Water Main Loop - Sandridge Rd. from Bay Ave. to 227th

Items	Quantity	Estimated Cost	Total Estimated
Trench Excavation Safety Systems	1	$ 500.00	$ 500
Erosion Control	1	$ 500.00	$ 500
Locate Existing Utilities	1	$ 250.00	$ 250
8-inch Water Pipe, Including Fittings	12640	$ 35.00	$ 442,400
Additional Pipe Fittings	4000	$ 2.75	$ 11,000
8-inch Gate Valves	15	$ 950.00	$ 14,250
Fire Hydrants	18	$ 2,800.00	$ 50,400
Service Connections	6	$ 450.00	$ 2,700
Sample Stations	6	$ 1,250.00	$ 7,500
Gravel Backfill	2500	$ 12.00	$ 30,000
Foundation Gravel	150	$ 35.00	$ 5,250
Asphalt Concrete Pavement Repair	95	$ 210.00	$ 19,950
Cold Mix Asphalt	0	$ 200.00	$ -
Crushed Surfacing, Top Course	750	$ 15.00	$ 11,250
Surface Restoration	7500	$ 2.75	$ 20,625
Labor Burden For District Crew	1400	$ 120.00	$ 168,000
			$ -
			$ 784,575

Subtotal	**$**	**784,575**
Sales Tax - 7.8%	**$**	**47,995**
Contingency - Add 15%	**$**	**117,686**
Engineering Cost	**$**	**149,069**
ROW or Easement Acquisition	**$**	**-**
Total	**$**	**1,099,326**
Say:	**$**	**1,100,000**

North Beach Water District **12/18/2014**
Project Cost Estimate

2014 WSP D-12 Install Water Main Loop - U St. from 253rd Ln. to 227th St.

Items	Quantity	Estimated Cost	Total Estimated
Trench Excavation Safety Systems	1	$ 750.00	$ 750
Erosion Control	1	$ 1,500.00	$ 1,500
Locate Existing Utilities	1	$ 250.00	$ 250
8-inch Water Pipe, Including Fittings	7500	$ 35.00	$ 262,500
Additional Pipe Fittings	2500	$ 2.75	$ 6,875
8-inch Gate Valves	10	$ 950.00	$ 9,500
Fire Hydrants	8	$ 2,800.00	$ 22,400
Service Connections	12	$ 450.00	$ 5,400
Sample Stations	3	$ 1,250.00	$ 3,750
Gravel Backfill	450	$ 12.00	$ 5,400
Foundation Gravel	70	$ 35.00	$ 2,450
Asphalt Concrete Pavement Repair	30	$ 210.00	$ 6,300
Cold Mix Asphalt	0	$ 200.00	$ -
Crushed Surfacing, Top Course	250	$ 15.00	$ 3,750
Surface Restoration	1200	$ 2.75	$ 3,300
Labor Burden For District Crew	900	$ 120.00	$ 108,000
			$ -
			$ 442,125

Subtotal	**$**	**442,125**
Sales Tax - 7.8%	**$**	**25,867**
Contingency - Add 15%	**$**	**66,319**
Engineering Cost	**$**	**84,004**
ROW or Easement Acquisition	**$**	**-**
Total	**$**	**618,314**
Say:	**$**	**620,000**

North Beach Water District **12/18/2014**
Project Cost Estimate

2014 WSP D-13 Install Water Main Loop - 250th St. from U St. to Y Ln.

Items	Quantity	Estimated Cost	Total Estimated
Trench Excavation Safety Systems	1	$ 750.00	$ 750
Erosion Control	1	$ 1,500.00	$ 1,500
Locate Existing Utilities	1	$ 250.00	$ 250
8-inch Water Pipe, Including Fittings	1200	$ 35.00	$ 42,000
Additional Pipe Fittings	550	$ 2.75	$ 1,513
8-inch Gate Valves	2	$ 950.00	$ 1,900
Fire Hydrants	2	$ 2,800.00	$ 5,600
Service Connections	5	$ 450.00	$ 2,250
Sample Stations	0	$ 1,250.00	$ -
Gravel Backfill	50	$ 12.00	$ 600
Foundation Gravel	15	$ 35.00	$ 525
Asphalt Concrete Pavement Repair	20	$ 210.00	$ 4,200
Cold Mix Asphalt	0	$ 200.00	$ -
Crushed Surfacing, Top Course	90	$ 15.00	$ 1,350
Surface Restoration	650	$ 2.75	$ 1,788
Labor Burden For District Crew	460	$ 120.00	$ 55,200
			$ -
			$ 119,425

Subtotal	**$**	**119,425**
Sales Tax - 7.8%	**$**	**4,815**
Contingency - Add 15%	**$**	**17,914**
Engineering Cost	**$**	**22,691**
ROW or Easement Acquisition	**$**	**-**
Total	**$**	**164,844**
Say:	**$**	**165,000**

North Beach Water District
Project Cost Estimate

12/18/2014

2014 WSP M-01 - Complete AMR Meter Retofit Program

Items	Quantity	Estimated Cost	Total Estimated
5/8 X 3/4 Resetter	1449	$ 95.00	$ 137,655
1" Resetter	4	$ 105.00	$ 420
1.5" Resetter	2	$ 185.00	$ 370
2" Resetter	2	$ 545.00	$ 1,090
5/8 X 3/4 Meter	1449	$ 180.00	$ 260,820
1" Meter	4	$ 273.00	$ 1,092
1.5" Meter	2	$ 480.00	$ 960
2" Meter	2	$ 580.00	$ 1,160
Meter Box	400	$ 35.00	$ 14,000
Meter Box Lid marked "WATER"	400	$ 29.00	$ 11,600
Labor Burden For District Crew	1600	$ 30.00	$ 48,000
			$ 477,167

Subtotal	**$**	**477,167**
Sales Tax - 7.8%	**$**	**33,475**
Contingency - Add 2.5%	**$**	**11,929**
Engineering Cost	**$**	**-**
ROW or Easement Acquisition	**$**	**-**
Total	**$**	**522,571**
Say:	**$**	**525,000**

North Beach Water District **12/18/2014**
Project Cost Estimate

2014 WSP P-01 Booster Staion Birch Place and 227th (Sunset Sands)

Items	Quantity	Estimated Cost	Total Estimated
Trench Excavation Safety Systems	1	$ 500.00	$ 500
Erosion Control	1	$ 1,500.00	$ 1,500
Locate Existing Utilities	1	$ 500.00	$ 500
8-inch Water Pipe, Including Fittings	500	$ 35.00	$ 17,500
Additional Pipe Fittings	1000	$ 2.75	$ 2,750
8-inch Gate Valves	10	$ 950.00	$ 9,500
Fire Hydrants	1	$ 2,800.00	$ 2,800
Booster Pump Pitless Units	4	$ 5,000.00	$ 20,000
Domestic Booster Pumps	2	$ 2,250.00	$ 4,500
High Flow (fire) Booster Pumps	2	$ 7,500.00	$ 15,000
Gravel Backfill	50	$ 12.00	$ 600
Foundation Gravel	15	$ 35.00	$ 525
Asphalt Concrete Pavement Repair	20	$ 210.00	$ 4,200
Flow Meter	1	$ 5,000.00	$ 5,000
Electrical & Controls	1	$ 40,000.00	$ 40,000
Crushed Surfacing, Top Course	90	$ 15.00	$ 1,350
Surface Restoration	200	$ 2.75	$ 550
Labor Burden For District Crew	88	$ 120.00	$ 10,560
			$ -
			$ 137,335

Subtotal	**$**	**137,335**
Sales Tax - 7.8%	**$**	**9,651**
Contingency - Add 15%	**$**	**20,600**
Engineering Cost	**$**	**48,000**
ROW or Easement Acquisition	**$**	**32,000**
Total	**$**	**247,586**
Say:	**$**	**250,000**

APPENDIX K

FINANCIAL MODEL

North Beach Water District
Comprehensive Rate Study
Summary

Revenue Requirement	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Revenues																					
Rate Revenues Under Existing Rates	$ 1,576,410	$ 1,579,301	$ 1,582,203	$ 1,585,115	$ 1,588,037	$ 1,590,970	$ 1,593,913	$ 1,596,867	$ 1,599,832	$ 1,602,807	$ 1,605,792	$ 1,608,789	$ 1,611,796	$ 1,614,813	$ 1,617,841	$ 1,620,880	$ 1,623,930	$ 1,626,990	$ 1,630,061	$ 1,633,143	$ 1,636,236
Non-Rate Revenues	119,600	127,500	127,285	127,609	127,935	128,261	128,588	128,781	129,234	129,574	129,905	130,236	130,568	130,901	131,235	131,570	131,906	132,242	132,580	132,918	133,257
Total Revenues	**$ 1,696,010**	**$ 1,706,801**	**$ 1,709,487**	**$ 1,712,724**	**$ 1,715,972**	**$ 1,719,231**	**$ 1,722,501**	**$ 1,725,648**	**$ 1,729,065**	**$ 1,732,381**	**$ 1,735,697**	**$ 1,739,025**	**$ 1,742,364**	**$ 1,745,715**	**$ 1,749,077**	**$ 1,752,450**	**$ 1,755,836**	**$ 1,759,233**	**$ 1,762,641**	**$ 1,766,061**	**$ 1,769,493**
Expenses																					
Cash Operating Expenses	$ 864,800	$ 922,400	$ 888,206	$ 910,309	$ 932,523	$ 955,335	$ 1,058,764	$ 996,825	$ 1,021,535	$ 1,046,913	$ 1,072,977	$ 1,099,745	$ 1,127,237	$ 1,155,473	$ 1,184,473	$ 1,214,258	$ 1,244,849	$ 1,276,269	$ 1,308,541	$ 1,341,687	$ 1,375,732
Existing Debt Service	387,037	448,564	545,918	542,073	533,530	533,860	532,641	531,696	527,751	523,606	524,262	519,517	414,309	409,491	408,037	406,114	403,720	405,152	400,834	126,015	124,197
New Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rate Funded System Reinvestment	316,000	316,000	316,000	344,000	372,000	395,000	420,000	440,000	470,000	500,000	530,000	560,000	690,000	720,000	740,000	790,000	820,000	850,000	890,000	1,200,000	1,220,000
Total Expenses	**$ 1,567,837**	**$ 1,686,964**	**$ 1,750,124**	**$ 1,796,382**	**$ 1,838,053**	**$ 1,884,196**	**$ 2,011,404**	**$ 1,968,521**	**$ 2,019,286**	**$ 2,070,520**	**$ 2,127,239**	**$ 2,179,262**	**$ 2,231,547**	**$ 2,284,964**	**$ 2,332,510**	**$ 2,410,372**	**$ 2,468,570**	**$ 2,531,421**	**$ 2,599,374**	**$ 2,667,702**	**$ 2,719,928**
Net Surplus (Deficiency)	**$ 128,173**	**$ 19,838**	**$ (40,636)**	**$ (83,658)**	**$ (122,081)**	**$ (164,965)**	**$ (288,903)**	**$ (242,873)**	**$ (290,221)**	**$ (338,139)**	**$ (391,541)**	**$ (440,237)**	**$ (489,183)**	**$ (539,249)**	**$ (583,434)**	**$ (657,921)**	**$ (712,734)**	**$ (772,189)**	**$ (836,733)**	**$ (901,641)**	**$ (950,435)**
Additions to Meet Coverage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Surplus (Deficiency)	**$ 128,173**	**$ 19,838**	**$ (40,636)**	**$ (83,658)**	**$ (122,081)**	**$ (164,965)**	**$ (288,903)**	**$ (242,873)**	**$ (290,221)**	**$ (338,139)**	**$ (391,541)**	**$ (440,237)**	**$ (489,183)**	**$ (539,249)**	**$ (583,434)**	**$ (657,921)**	**$ (712,734)**	**$ (772,189)**	**$ (836,733)**	**$ (901,641)**	**$ (950,435)**
% of Rate Revenue	**0.00%**	**0.00%**	**2.57%**	**5.28%**	**7.69%**	**10.37%**	**18.13%**	**15.21%**	**18.14%**	**21.10%**	**24.38%**	**27.36%**	**30.35%**	**33.39%**	**36.06%**	**40.59%**	**43.89%**	**47.46%**	**51.33%**	**55.21%**	**58.09%**
Annual Rate Adjustment	**0.00%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**
Cumulative Annual Rate Adjustment	**0.00%**	**2.50%**	**5.06%**	**7.69%**	**10.38%**	**13.14%**	**15.97%**	**18.87%**	**21.84%**	**24.89%**	**28.01%**	**31.21%**	**34.49%**	**37.85%**	**41.30%**	**44.83%**	**48.45%**	**52.16%**	**55.97%**	**59.87%**	**63.86%**
Rate Revenues After Rate Increase	$ 1,576,410	$ 1,618,784	$ 1,662,302	$ 1,706,995	$ 1,752,896	$ 1,800,036	$ 1,848,451	$ 1,898,173	$ 1,949,240	$ 2,001,686	$ 2,055,550	$ 2,110,870	$ 2,167,686	$ 2,226,038	$ 2,285,967	$ 2,347,518	$ 2,410,733	$ 2,475,658	$ 2,542,339	$ 2,610,825	$ 2,681,163
Additional Taxes from Rate Increase	$ -	$ 1,986	$ 4,028	$ 6,129	$ 8,291	$ 10,514	$ 12,801	$ 15,153	$ 17,572	$ 20,060	$ 22,618	$ 25,250	$ 27,956	$ 30,738	$ 33,600	$ 36,543	$ 39,568	$ 42,680	$ 45,878	$ 49,168	$ 52,549
Net Cash Flow After Rate Increase	**128,173**	**57,335**	**35,435**	**32,093**	**34,487**	**33,588**	**(47,166)**	**43,281**	**41,615**	**40,681**	**35,598**	**36,594**	**38,752**	**41,237**	**51,092**	**32,174**	**34,501**	**33,800**	**29,666**	**26,873**	**41,943**
Coverage After Rate Increases	**3.15**	**3.07**	**3.32**	**3.41**	**3.51**	**3.56**	**3.34**	**3.72**	**3.83**	**3.94**	**3.99**	**3.67**	**3.73**	**3.88**	**3.97**	**4.09**	**4.19**	**4.26**	**4.43**	**n/a**	**n/a**
Sample Residential Monthly Bill (3/4" meter, 3.6 ccf)	**$ 47.61**	**$ 48.80**	**$ 50.02**	**$ 51.28**	**$ 52.56**	**$ 53.87**	**$ 55.22**	**$ 56.60**	**$ 58.01**	**$ 59.46**	**$ 60.95**	**$ 62.47**	**$ 64.04**	**$ 65.64**	**$ 67.28**	**$ 68.96**	**$ 70.68**	**$ 72.45**	**$ 74.26**	**$ 76.12**	**$ 78.02**
Monthly Average Increase ($)	$ -	$ 1.19	$ 1.22	$ 1.25	$ 1.28	$ 1.31	$ 1.35	$ 1.38	$ 1.41	$ 1.45	$ 1.49	$ 1.52	$ 1.56	$ 1.60	$ 1.64	$ 1.68	$ 1.72	$ 1.77	$ 1.81	$ 1.86	$ 1.90

Fund Balance	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
OPERATING FUND																					
Beginning Balance	$ 450,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 452,834	$ 496,114	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000
plus: Net Cash Flow after Rate Increase	128,173	57,335	35,435	32,093	34,487	33,588	(47,166)	43,281	41,615	40,681	35,598	36,594	38,752	41,237	51,092	32,174	34,501	33,800	29,666	26,873	41,943
less: Transfer of Surplus to Capital Fund	(78,173)	(57,335)	(35,435)	(32,093)	(34,487)	(33,588)	-	-	(37,729)	(40,681)	(35,598)	(36,594)	(38,752)	(41,237)	(51,092)	(32,174)	(34,501)	(33,800)	(29,666)	(26,873)	(41,943)
Ending Balance	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 452,834**	**$ 496,114**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**
Minimum Target Balance	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*
Days	*211*	*198*	*206*	*200*	*196*	*191*	*157*	*182*	*179*	*174*	*171*	*166*	*162*	*158*	*154*	*150*	*147*	*143*	*140*	*136*	*133*
CAPITAL FUND																					
Beginning Balance	$ 2,785,143	$ 2,862,435	$ 1,084,768	$ 655,707	$ 554,552	$ 291,439	$ 335,731	$ 357,299	$ 156,900	$ 13,885	$ 7,937	$ 583,393	$ 195,716	$ 934,916	$ 475,075	$ 1,277,468	$ 170,560	$ 1,035,540	$ 1,932,326	$ 2,867,577	$ 4,112,744
plus: Rate Funded System Reinvestment/ Equipment Transfers	316,000	316,000	316,000	344,000	372,000	395,000	420,000	440,000	470,000	500,000	530,000	560,000	690,000	720,000	740,000	790,000	820,000	850,000	890,000	1,200,000	1,220,000
plus: Transfers from Operating Fund	78,173	57,335	35,435	32,093	34,487	33,588	-	-	37,729	40,681	35,598	36,594	38,752	41,237	51,092	32,174	34,501	33,800	29,666	26,873	41,943
plus: General Facility Charges	15,000	15,000	9,634	9,659	9,684	9,709	9,734	9,759	9,785	9,810	9,836	9,861	9,887	9,913	9,938	9,964	9,990	10,016	10,042	10,068	10,094
plus: Grants/ Donations/ CIAC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Additional Proceeds (Costs)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Transfer from Rate Stabilization Account	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Net Debt Proceeds Available for Projects	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Interest Earnings	7,989	8,210	3,111	1,881	1,591	836	963	1,025	450	40	23	1,673	561	2,682	1,363	3,664	489	2,970	5,543	8,225	11,797
Total Funding Sources	**$ 3,202,305**	**$ 3,258,980**	**$ 1,448,947**	**$ 1,043,339**	**$ 972,314**	**$ 730,571**	**$ 766,428**	**$ 808,084**	**$ 674,864**	**$ 564,416**	**$ 583,393**	**$ 1,191,522**	**$ 934,916**	**$ 1,708,747**	**$ 1,277,468**	**$ 2,113,270**	**$ 1,035,540**	**$ 1,932,326**	**$ 2,867,577**	**$ 4,112,744**	**$ 5,396,578**
less: Capital Expenditures	(339,870)	(2,174,212)	(793,241)	(488,787)	(680,875)	(394,840)	(409,129)	(651,184)	(660,979)	(556,480)	-	(995,806)	-	(1,233,672)	-	(1,942,710)	-	-	-	-	-
Ending Capital Fund Balance	**$ 2,862,435**	**$ 1,084,768**	**$ 655,707**	**$ 554,552**	**$ 291,439**	**$ 335,731**	**$ 357,299**	**$ 156,900**	**$ 13,885**	**$ 7,937**	**$ 583,393**	**$ 195,716**	**$ 934,916**	**$ 475,075**	**$ 1,277,468**	**$ 170,560**	**$ 1,035,540**	**$ 1,932,326**	**$ 2,867,577**	**$ 4,112,744**	**$ 5,396,578**
Minimum Target Balance	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*

North Beach Water District
Comprehensive Rate Study
Assumptions

Economic & Financial Factors

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
1	**General Cost Inflation**	2.39%	2.39%	2.39%	2.39%	2.39%	2.39%	2.39%	2.39%	2.39%	2.39%	2.39%	2.39%	2.39%	2.39%	2.39%	2.39%	2.39%	2.39%	2.39%	2.39%	2.39%
2	**Construction Cost Inflation**	3.62%	3.62%	3.62%	3.62%	3.62%	3.62%	3.62%	3.62%	3.62%	3.62%	3.62%	3.62%	3.62%	3.62%	3.62%	3.62%	3.62%	3.62%	3.62%	3.62%	3.62%
3	**Labor Cost Inflation**	2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	2.86%
4	**Benefit Cost Inflation**	10.00%	8.00%	6.00%	4.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
5	**Customer Growth**	0.26%	0.26%	0.26%	0.26%	0.26%	0.26%	0.26%	0.26%	0.26%	0.26%	0.26%	0.26%	0.26%	0.26%	0.26%	0.26%	0.26%	0.26%	0.26%	0.26%	0.26%
6	**Assumed Change in Demand per ERU**	-3.00%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%
7	**Demand Growth**	-2.75%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%
8	**General Inflation plus Composite Growth**	-0.42%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%
9	**No Escalation**	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
10	**[Extra]**	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Investment Interest	0.29%	0.29%	0.29%	0.29%	0.29%	0.29%	0.29%	0.29%	0.29%	0.29%	0.29%	0.29%	0.29%	0.29%	0.29%	0.29%	0.29%	0.29%	0.29%	0.29%	0.29%
	State Excise Tax	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%
	B&O Tax	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%

Accounting Assumptions

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
FISCAL POLICY RESTRICTIONS																						
	Min. Op. Fund Balance Target (days of O&M expense)	190	178	185	180	176	172	155	165	161	157	153	149	146	142	139	135	132	129	126	122	119
	Max. Op. Fund Balance (days of O&M expense)	211	198	205	200	196	191	172	183	179	174	170	166	162	158	154	150	147	143	139	136	133
	Minimum Capital Fund Balance Target																					
	Select Minimum Capital Fund Balance Target: **2**	**User Input**																				
	1 - Defined as % of Plant																					
	Plant-in-Service in 2013: $ 8,233,776	Estimated Net Assets																				
	Minimum Capital Fund Balance - % of plant assets	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
	2 - Amount at Right ==>	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
RATE FUNDED SYSTEM REINVESTMENT																						
	Select Reinvestment Funding Strategy: **3**	**User Input**																				
	Amount of Annual Cash Funding from Rates																					
	1 - Equal to Annual Depreciation Expense	$ 163,523	$ 207,007	$ 222,872	$ 232,648	$ 246,265	$ 254,162	$ 262,345	$ 275,368	$ 288,588	$ 299,717	$ 299,717	$ 319,634	$ 319,634	$ 344,307	$ 344,307	$ 383,161	$ 383,161	$ 383,161	$ 383,161	$ 383,161	$ 383,161
	2 - Equal to Annual Depreciation less Annual Debt Principal Payments	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 18,079	$ 8,079	$ 36,933	$ 26,933	$ 11,933	$ 1,933	$ 261,933	$ 383,161
	3 - Equal to Amount at Right ==>	$ 316,000	$ 316,000	$ 316,000	$ 344,000	$ 372,000	$ 395,000	$ 420,000	$ 440,000	$ 470,000	$ 500,000	$ 530,000	$ 560,000	$ 690,000	$ 720,000	$ 740,000	$ 790,000	$ 820,000	$ 850,000	$ 890,000	$ 1,200,000	$ 1,220,000
	4 - Do Not Fund System Reinvestment																					

Capital Financing Assumptions

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
General Facility Charge (GFC)																						
	Select GFC Alternative: 1																					
	1 - User Input (Current Charge): **$ 1,243**	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243
	2 - Calculated Charge: -																					
	Total Equivalent Residential Units (Estimate)	2,957	2,969	2,981	2,989	2,996	3,004	3,012	3,020	3,028	3,036	3,043	3,051	3,059	3,067	3,075	3,083	3,091	3,099	3,107	3,115	3,123
	Additional Units Per Year	12	12	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	GFC Revenues	$ 15,000	$ 15,000	$ 9,634	$ 9,659	$ 9,684	$ 9,709	$ 9,734	$ 9,759	$ 9,785	$ 9,810	$ 9,836	$ 9,861	$ 9,887	$ 9,913	$ 9,938	$ 9,964	$ 9,990	$ 10,016	$ 10,042	$ 10,068	$ 10,094
FUNDING SOURCES																						
	Grants	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Additional Proceeds (Costs)																					
	[Extra line]	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	[Extra line]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	[Extra line]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	[Extra line]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	[Extra line]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total Additional Proceeds	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
REVENUE BONDS																						
	Term (years)	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	Interest Cost	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%
	Issuance Cost	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
	Revenue Bond Coverage Requirement: **1.25**																					
PWTF LOAN																						
	Term (years; no more than 20 years)	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	Interest Cost	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
	Required Local Match	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
GO BONDS																						
	Term (years)	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	Interest Cost	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
	Issuance Cost	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

North Beach Water District
Comprehensive Rate Study
Operating Revenue and Expenditure Forecast

Revenues/Expenses		FORECAST BASIS	Budget 2014	Budget 2015	Projection 2016	Projection 2017	Projection 2018	Projection 2019	Projection 2020	Projection 2021	Projection 2022	Projection 2023	Projection 2024	Projection 2025	Projection 2026	Projection 2027	Projection 2028	Projection 2029	Projection 2030	Projection 2031	Projection 2032	Projection 2033	Projection 2034
Rate Revenues																							
Base Rate	5	Customer Growth	$ 1,335,510	$ 1,338,983	$ 1,342,464	$ 1,345,954	$ 1,349,454	$ 1,352,962	$ 1,356,480	$ 1,360,007	$ 1,363,543	$ 1,367,088	$ 1,370,643	$ 1,374,206	$ 1,377,779	$ 1,381,361	$ 1,384,953	$ 1,388,554	$ 1,392,164	$ 1,395,784	$ 1,399,413	$ 1,403,051	$ 1,406,699
Metered Water Sales	7	Demand Growth	240,900	240,319	239,739	239,160	238,583	238,008	237,433	236,860	236,289	235,719	235,150	234,582	234,016	233,452	232,888	232,326	231,766	231,207	230,649	230,092	229,537
[Extra]	5	Customer Growth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Rate Revenue			$ 1,576,410	$ 1,579,301	$ 1,582,203	$ 1,585,115	$ 1,588,037	$ 1,590,970	$ 1,593,913	$ 1,596,867	$ 1,599,832	$ 1,602,807	$ 1,605,792	$ 1,608,789	$ 1,611,796	$ 1,614,813	$ 1,617,841	$ 1,620,880	$ 1,623,930	$ 1,626,990	$ 1,630,061	$ 1,633,143	$ 1,636,236
Non-Rate Revenues																							
New Customer Fees	5	Customer Growth	$ 8,000	$ 9,000	$ 9,023	$ 9,047	$ 9,070	$ 9,094	$ 9,118	$ 9,141	$ 9,165	$ 9,189	$ 9,213	$ 9,237	$ 9,261	$ 9,285	$ 9,309	$ 9,333	$ 9,357	$ 9,382	$ 9,406	$ 9,431	$ 9,455
Delinquent Lock-off Fees	5	Customer Growth	30,000	35,000	35,091	35,182	35,274	35,365	35,457	35,550	35,642	35,735	35,828	35,921	36,014	36,108	36,202	36,296	36,390	36,485	36,580	36,675	36,770
Interest on Funds on Deposit	5	Customer Growth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Connection Fees	5	Customer Growth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Surfside Management Contract	5	Customer Growth	60,000	60,000	60,156	60,312	60,469	60,626	60,784	60,942	61,101	61,259	61,419	61,578	61,738	61,899	62,060	62,221	62,383	62,545	62,708	62,871	63,034
Surfside Reimbursements	5	Customer Growth	1,800	2,000	2,005	2,010	2,016	2,021	2,026	2,031	2,037	2,042	2,047	2,053	2,058	2,063	2,069	2,074	2,079	2,085	2,090	2,096	2,101
Customer Service Charges	5	Customer Growth	15,000	15,000	15,039	15,078	15,117	15,157	15,196	15,236	15,275	15,315	15,355	15,395	15,435	15,475	15,515	15,555	15,596	15,636	15,677	15,718	15,759
Surplus Income	5	Customer Growth	2,000	2,500	2,507	2,513	2,520	2,526	2,533	2,539	2,546	2,552	2,559	2,566	2,572	2,579	2,586	2,593	2,599	2,606	2,613	2,620	2,626
Good Neighbor	5	Customer Growth	1,000	1,000	1,003	1,005	1,008	1,010	1,013	1,016	1,018	1,021	1,024	1,026	1,029	1,032	1,034	1,037	1,040	1,042	1,045	1,048	1,051
[Extra]	5	Customer Growth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Non-Rate Revenues			$ 117,800	$ 124,500	$ 124,824	$ 125,148	$ 125,474	$ 125,800	$ 126,127	$ 126,455	$ 126,784	$ 127,113	$ 127,444	$ 127,775	$ 128,107	$ 128,440	$ 128,774	$ 129,109	$ 129,445	$ 129,781	$ 130,119	$ 130,457	$ 130,796
TOTAL REVENUES			$ 1,694,210	$ 1,703,801	$ 1,707,026	$ 1,710,263	$ 1,713,511	$ 1,716,770	$ 1,720,040	$ 1,723,322	$ 1,726,615	$ 1,729,920	$ 1,733,236	$ 1,736,564	$ 1,739,903	$ 1,743,253	$ 1,746,616	$ 1,749,989	$ 1,753,375	$ 1,756,772	$ 1,760,180	$ 1,763,600	$ 1,767,032

Revenues/Expenses		FORECAST BASIS	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
EXCISE TAXES		Calculation	$ 79,000	$ 81,636	$ 81,787	$ 81,940	$ 82,092	$ 82,246	$ 82,400	$ 82,554	$ 82,709	$ 82,864	$ 83,020	$ 83,177	$ 83,334	$ 83,492	$ 83,650	$ 83,809	$ 83,968	$ 84,128	$ 84,288	$ 84,449	$ 84,611
B&O TAXES		Calculation	1,000	1,380	1,303	1,306	1,309	1,313	1,316	1,320	1,323	1,326	1,330	1,333	1,337	1,340	1,344	1,347	1,351	1,354	1,358	1,361	1,365
FIELD OPERATIONS																							
Field Payroll																							
Wages - Field	3	Labor Cost Inflation	172,000	198,000	203,656	209,474	215,458	221,613	227,944	234,456	241,154	248,043	255,128	262,417	269,913	277,624	285,555	293,712	302,103	310,733	319,610	328,740	338,131
Taxes & Benefits - Field	4	Benefit Cost Inflation	59,000	58,500	62,010	64,490	66,425	68,418	70,470	72,585	74,762	77,005	79,315	81,695	84,145	86,670	89,270	91,948	94,706	97,548	100,474	103,488	106,593
Common Expenses																							
Vehicle	1	General Cost Inflation	25,000	25,000	25,598	26,211	26,838	27,480	28,137	28,811	29,500	30,206	30,929	31,669	32,426	33,202	33,997	34,810	35,643	36,496	37,369	38,263	39,179
Cellular Phones	1	General Cost Inflation	3,500	6,000	6,144	6,291	6,441	6,595	6,753	6,915	7,080	7,249	7,423	7,600	7,782	7,969	8,159	8,354	8,554	8,759	8,969	9,183	9,403
Equipment Rental	1	General Cost Inflation	1,000	1,000	1,024	1,048	1,074	1,099	1,125	1,152	1,180	1,208	1,237	1,267	1,297	1,328	1,360	1,392	1,426	1,460	1,495	1,531	1,567
Tools/Equipment Purchase	1	General Cost Inflation	5,000	5,000	5,120	5,242	5,368	5,496	5,627	5,762	5,900	6,041	6,186	6,334	6,485	6,640	6,799	6,962	7,129	7,299	7,474	7,653	7,836
Safety Equipment & PPE	1	General Cost Inflation	5,000	5,000	5,120	5,242	5,368	5,496	5,627	5,762	5,900	6,041	6,186	6,334	6,485	6,640	6,799	6,962	7,129	7,299	7,474	7,653	7,836
Maintenance - General	1	General Cost Inflation	10,000	10,000	10,239	10,484	10,735	10,992	11,255	11,524	11,800	12,082	12,371	12,667	12,971	13,281	13,599	13,924	14,257	14,598	14,948	15,305	15,671
Other Common Expenses	1	General Cost Inflation	3,000	3,000	3,072	3,145	3,221	3,298	3,376	3,457	3,540	3,625	3,711	3,800	3,891	3,984	4,080	4,177	4,277	4,379	4,484	4,592	4,701
Distribution Expenses																							
Meter/Service Box	1	General Cost Inflation	1,500	3,000	3,072	3,145	3,221	3,298	3,376	3,457	3,540	3,625	3,711	3,800	3,891	3,984	4,080	4,177	4,277	4,379	4,484	4,592	4,701
Distribution Lines	1	General Cost Inflation	15,000	15,000	15,359	15,726	16,103	16,488	16,882	17,286	17,700	18,124	18,557	19,001	19,456	19,921	20,398	20,886	21,386	21,897	22,421	22,958	23,507
Contract Labor	1	General Cost Inflation	1,500	1,500	1,536	1,573	1,610	1,649	1,688	1,729	1,770	1,812	1,856	1,900	1,946	1,992	2,040	2,089	2,139	2,190	2,242	2,296	2,351
Other Distribution Expenses	1	General Cost Inflation	500	500	512	524	537	550	563	576	590	604	619	633	649	664	680	696	713	730	747	765	784
Production/Treatment Plant Expenses																							
Electricity	1	General Cost Inflation	36,000	36,000	36,861	37,743	38,646	39,571	40,518	41,487	42,480	43,496	44,537	45,603	46,694	47,811	48,955	50,127	51,326	52,554	53,811	55,099	56,417
Treatment Maintenance	1	General Cost Inflation	1,000	2,000	2,048	2,097	2,147	2,198	2,251	2,305	2,360	2,416	2,474	2,533	2,594	2,656	2,720	2,785	2,851	2,920	2,990	3,061	3,134
Production Maintenance	1	General Cost Inflation	14,500	10,000	10,239	10,484	10,735	10,992	11,255	11,524	11,800	12,082	12,371	12,667	12,971	13,281	13,599	13,924	14,257	14,598	14,948	15,305	15,671
Treatment Parts/Supplies	1	General Cost Inflation	2,500	5,000	5,120	5,242	5,368	5,496	5,627	5,762	5,900	6,041	6,186	6,334	6,485	6,640	6,799	6,962	7,129	7,299	7,474	7,653	7,836
Water Testing	1	General Cost Inflation	6,000	5,000	5,120	5,242	5,368	5,496	5,627	5,762	5,900	6,041	6,186	6,334	6,485	6,640	6,799	6,962	7,129	7,299	7,474	7,653	7,836
Production Parts/Supplies	1	General Cost Inflation	-	1,500	1,536	1,573	1,610	1,649	1,688	1,729	1,770	1,812	1,856	1,900	1,946	1,992	2,040	2,089	2,139	2,190	2,242	2,296	2,351
Other Production/Treatment	1	General Cost Inflation	2,500	1,500	1,536	1,573	1,610	1,649	1,688	1,729	1,770	1,812	1,856	1,900	1,946	1,992	2,040	2,089	2,139	2,190	2,242	2,296	2,351
ADMINISTRATIVE EXPENSES																							
Administrative Payroll Expenses																							
Office Wages	3	Labor Cost Inflation	152,500	159,000	163,542	168,214	173,019	177,962	183,046	188,275	193,654	199,186	204,876	210,729	216,748	222,940	229,309	235,860	242,598	249,528	256,656	263,988	271,530
Surfside Management	3	Labor Cost Inflation	24,000	24,000	24,686	25,391	26,116	26,862	27,630	28,419	29,231	30,066	30,925	31,808	32,717	33,651	34,613	35,601	36,619	37,665	38,741	39,847	40,986
Employment Taxes and Benefits	4	Benefit Cost Inflation	38,500	36,000	38,160	39,686	40,877	42,103	43,366	44,667	46,007	47,388	48,809	50,274	51,782	53,335	54,935	56,583	58,281	60,029	61,830	63,685	65,596
Office Expenses																							
Office Supplies	1	General Cost Inflation	12,000	12,000	12,287	12,581	12,882	13,190	13,506	13,829	14,160	14,499	14,846	15,201	15,565	15,937	16,318	16,709	17,109	17,518	17,937	18,366	18,806
Computer Expense	1	General Cost Inflation	4,500	4,500	4,608	4,718	4,831	4,946	5,065	5,186	5,310	5,437	5,567	5,700	5,837	5,976	6,119	6,266	6,416	6,569	6,726	6,887	7,052
Technical Services	1	General Cost Inflation	1,000	2,500	2,560	2,621	2,684	2,748	2,814	2,881	2,950	3,021	3,093	3,167	3,243	3,320	3,400	3,481	3,564	3,650	3,737	3,826	3,918
Billing Supplies	8	General Inflation plus Composite Growth	27,000	27,000	27,579	28,171	28,776	29,393	30,024	30,668	31,326	31,998	32,684	33,386	34,102	34,834	35,581	36,345	37,124	37,921	38,735	39,566	40,415
Office Telephones	1	General Cost Inflation	8,000	8,000	8,191	8,387	8,588	8,794	9,004	9,219	9,440	9,666	9,897	10,134	10,376	10,625	10,879	11,139	11,406	11,679	11,958	12,244	12,537
Public Relations	1	General Cost Inflation	3,000	3,000	3,072	3,145	3,221	3,298	3,376	3,457	3,540	3,625	3,711	3,800	3,891	3,984	4,080	4,177	4,277	4,379	4,484	4,592	4,701
Office Rent	1	General Cost Inflation	15,600	15,600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Office Machine Rental	1	General Cost Inflation	10,500	8,000	8,191	8,387	8,588	8,794	9,004	9,219	9,440	9,666	9,897	10,134	10,376	10,625	10,879	11,139	11,406	11,679	11,958	12,244	12,537
Electricity - Office	1	General Cost Inflation	1,700	1,800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Office	1	General Cost Inflation	1,500	2,500	2,560	2,621	2,684	2,748	2,814	2,881	2,950	3,021	3,093	3,167	3,243	3,320	3,400	3,481	3,564	3,650	3,737	3,826	3,918
Professional Services																							
Meter Readers Services	8	General Inflation plus Composite Growth	20,000	24,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Engineering Services	1	General Cost Inflation	1,000	16,000	1,024	1,048	1,074	1,099	1,125	1,152	1,180	1,208	1,237	1,267	1,297	1,328	1,360	1,392	1,426	1,460	1,495	1,531	1,567
Legal Services	1	General Cost Inflation	20,000	12,000	12,287	12,581	12,882	13,190	13,506	13,829	14,160	14,499	14,846	15,201	15,565	15,937	16,318	16,709	17,109	17,518	17,937	18,366	18,806
Accounting Services	1	General Cost Inflation	8,000	4,000	4,096	4,194	4,294	4,397	4,502	4,610	4,720	4,833	4,949	5,067	5,188	5,312	5,439	5,570	5,703	5,839	5,979	6,122	6,269
Other Professional Services	1	General Cost Inflation	1,500	1,000	1,024	1,048	1,074	1,099	1,125	1,152	1,180	1,208	1,237	1,267	1,297	1,328	1,360	1,392	1,426	1,460	1,495	1,531	1,567
Other Service Expenses																							
Dues & Subscriptions	1	General Cost Inflation	3,500	3,500	3,584	3,669	3,757	3,847	3,939	4,033	4,130	4,229	4,330	4,434	4,540	4,648	4,760	4,873	4,990	5,109	5,232	5,357	5,485
Commissioner Education & Travel	1	General Cost Inflation	4,000	2,500	2,560	2,621	2,684	2,748	2,814	2,881	2,950	3,021	3,093	3,167	3,243	3,320	3,400	3,481	3,564	3,650	3,737	3,826	3,918
Employee Education & Travel	1	General Cost Inflation	8,000	8,500	8,703	8,912	9,125	9,343	9,567	9,796	10,030	10,270	10,516	10,767	11,025	11,289	11,559	11,835	12,119	12,409	12,705	13,009	13,321
Liability Insurance	1	General Cost Inflation	34,500	35,000	35,837	36,695	37,573	38,472	39,392	40,335	41,300	42,288	43,300	44,336	45,397	46,483	47,595	48,734	49,900	51,094	52,317	53,568	54,850
Taxes, Fees & Permit	1	General Cost Inflation	10,000	16,984	17,391	17,807	18,233	18,669	19,116	19,573	20,041	20,521	21,012	21,515	22,029	22,557	23,096	23,649	24,215	24,794	25,387	25,995	26,617
Other Services	1	General Cost Inflation	1,000	500	512	524	537	550	563	576	590	604	619	633	649	664	680	696	713	730	747	765	784
Commissioner Compensation	1	General Cost Inflation	8,000	10,000	10,239	10,484	10,735	10,992	11,255	11,524	11,800	12,082	12,371	12,667	12,971	13,281	13,599	13,924	14,257	14,598	14,948	15,305	15,671
Good Neighbor	5	Customer Growth	1,000	1,000	1,003	1,005	1,008	1,010	1,013	1,016	1,018	1,021	1,024	1,026	1,029	1,032	1,034	1,037	1,040	1,042	1,045	1,048	1,051
Add'l O&M from CIP		*From CIP*	-	8,000	6,500	6,000	6,000	6,000	86,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Cash O&M Expenditures			$ 864,800	$ 922,400	$ 888,206	$ 910,309	$ 932,523	$ 955,335	$ 1,058,764	$ 996,825	$ 1,021,535	$ 1,046,913	$ 1,072,977	$ 1,099,745	$ 1,127,237	$ 1,155,473	$ 1,184,473	$ 1,214,258	$ 1,244,849	$ 1,276,269	$ 1,308,541	$ 1,341,687	$ 1,375,732
Depreciation Expense in	2013	$ 163,523																					
Depreciation Expense		*Last year's plus annual additions from CIP*	$ 163,523	$ 207,007	$ 222,872	$ 232,648	$ 246,265	$ 254,162	$ 262,345	$ 275,368	$ 288,588	$ 299,717	$ 299,717	$ 319,634	$ 319,634	$ 344,307	$ 344,307	$ 383,161	$ 383,161	$ 383,161	$ 383,161	$ 383,161	$ 383,161
TOTAL EXPENSES			$ 1,028,323	$ 1,129,407	$ 1,111,078	$ 1,142,957	$ 1,178,788	$ 1,209,497	$ 1,321,108	$ 1,272,193	$ 1,310,123	$ 1,346,631	$ 1,372,694	$ 1,419,379	$ 1,446,871	$ 1,499,780	$ 1,528,780	$ 1,597,419	$ 1,628,011	$ 1,659,431	$ 1,691,702	$ 1,724,848	$ 1,758,893

North Beach Water District
Comprehensive Rate Study
Existing Debt Input

Existing Debt Service - Revenue Bonds	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Use Bond Reserve to Make Final Payments?	No																				
If Yes, Enter Payment Amount:	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Revenue Bond																					
Annual Interest Payment	$ 126,060	$ 125,190	$ 124,065	$ 122,565	$ 120,765	$ 118,440	$ 114,565	$ 110,965	$ 104,365	$ 97,565	$ 90,565	$ 83,165	$ 75,565	$ 67,565	$ 57,930	$ 47,825	$ 37,250	$ 25,500	$ 13,000	$ -	$ -
Annual Principal Payment	145,000	150,000	150,000	150,000	150,000	155,000	160,000	165,000	170,000	175,000	185,000	190,000	200,000	205,000	215,000	225,000	235,000	250,000	260,000	-	-
Total Annual Payment	$ 271,060	$ 275,190	$ 274,065	$ 272,565	$ 270,765	$ 273,440	$ 274,565	$ 275,965	$ 274,365	$ 272,565	$ 275,565	$ 273,165	$ 275,565	$ 272,565	$ 272,930	$ 272,825	$ 272,250	$ 275,500	$ 273,000	$ -	$ -
TOTAL REVENUE BONDS																					
Annual Interest Payment	$ 126,060	$ 125,190	$ 124,065	$ 122,565	$ 120,765	$ 118,440	$ 114,565	$ 110,965	$ 104,365	$ 97,565	$ 90,565	$ 83,165	$ 75,565	$ 67,565	$ 57,930	$ 47,825	$ 37,250	$ 25,500	$ 13,000	$ -	$ -
Annual Principal Payment	145,000	150,000	150,000	150,000	150,000	155,000	160,000	165,000	170,000	175,000	185,000	190,000	200,000	205,000	215,000	225,000	235,000	250,000	260,000	-	-
Total Annual Payment	$ 271,060	$ 275,190	$ 274,065	$ 272,565	$ 270,765	$ 273,440	$ 274,565	$ 275,965	$ 274,365	$ 272,565	$ 275,565	$ 273,165	$ 275,565	$ 272,565	$ 272,930	$ 272,825	$ 272,250	$ 275,500	$ 273,000	$ -	$ -
Use of Debt reserve for Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual Debt Reserve Target on Existing Revenue Bonds	275,965	275,965	275,965	275,965	275,965	275,965	275,965	275,965	275,565	275,565	275,565	275,565	275,565	275,500	275,500	275,500	275,500	275,500	273,000	-	-

Existing Debt Service - PWTF Loans	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
PWTF Loan #117																					
Annual Interest Payment	$ 3,158	$ 2,895	$ 2,632	$ 2,368	$ 2,105	$ 1,842	$ 1,579	$ 1,316	$ 1,053	$ 789	$ 526	$ 263	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payment	52,632	52,632	52,632	52,632	52,632	52,632	52,632	52,632	52,632	52,632	52,632	52,632	-	-	-	-	-	-	-	-	-
Total Annual Payment	$ 55,789	$ 55,526	$ 55,263	$ 55,000	$ 54,737	$ 54,474	$ 54,211	$ 53,947	$ 53,684	$ 53,421	$ 53,158	$ 52,895	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
PWTF Loan #129																					
Annual Interest Payment	$ 3,158	$ 2,895	$ 2,632	$ 2,368	$ 2,105	$ 1,842	$ 1,579	$ 1,316	$ 1,053	$ 789	$ 526	$ 263	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payment	52,632	52,632	52,632	52,632	52,632	52,632	52,632	52,632	52,632	52,632	52,632	52,632	-	-	-	-	-	-	-	-	-
Total Annual Payment	$ 55,789	$ 55,526	$ 55,263	$ 55,000	$ 54,737	$ 54,474	$ 54,211	$ 53,947	$ 53,684	$ 53,421	$ 53,158	$ 52,895	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Bias Software																					
Annual Interest Payment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payment	4,398	4,398	4,398	4,398	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Annual Payment	$ 4,398	$ 4,398	$ 4,398	$ 4,398	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TOTAL PWTF LOANS																					
Annual Interest Payment	$ 6,316	$ 5,789	$ 5,263	$ 4,737	$ 4,211	$ 3,684	$ 3,158	$ 2,632	$ 2,105	$ 1,579	$ 1,053	$ 526	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payment	109,661	109,661	109,661	109,661	105,263	105,263	105,263	105,263	105,263	105,263	105,263	105,263	-	-	-	-	-	-	-	-	-
Total Annual Payment	$ 115,977	$ 115,451	$ 114,924	$ 114,398	$ 109,474	$ 108,947	$ 108,421	$ 107,895	$ 107,368	$ 106,842	$ 106,316	$ 105,789	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Existing Debt Service - Other Loans	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
DWSRF Loan #121																					
Annual Interest Payment	$ -	$ 13,367	$ 12,699	$ 12,030	$ 11,362	$ 10,693	$ 10,025	$ 9,357	$ 8,688	$ 8,020	$ 7,352	$ 6,683	$ 6,015	$ 5,347	$ 4,678	$ 4,010	$ 3,342	$ 2,673	$ 2,005	$ 1,337	$ 668
Annual Principal Payment	-	44,556	44,556	44,556	44,556	44,556	44,556	44,556	44,556	44,556	44,556	44,556	44,556	44,556	44,556	44,556	44,556	44,556	44,556	44,556	44,556
Total Annual Payment	$ -	$ 57,923	$ 57,255	$ 56,586	$ 55,918	$ 55,250	$ 54,581	$ 53,913	$ 53,245	$ 52,576	$ 51,908	$ 51,240	$ 50,571	$ 49,903	$ 49,235	$ 48,566	$ 47,898	$ 47,230	$ 46,561	$ 45,893	$ 45,224
DWSRF Loan #129																					
Annual Interest Payment	$ -	$ -	$ 23,002	$ 21,852	$ 20,701	$ 19,551	$ 18,401	$ 17,251	$ 16,101	$ 14,951	$ 13,801	$ 12,651	$ 11,501	$ 10,351	$ 9,201	$ 8,051	$ 6,900	$ 5,750	$ 4,600	$ 3,450	$ 2,300
Annual Principal Payment	-	-	76,672	76,672	76,672	76,672	76,672	76,672	76,672	76,672	76,672	76,672	76,672	76,672	76,672	76,672	76,672	76,672	76,672	76,672	76,672
Total Annual Payment	$ -	$ -	$ 99,674	$ 98,524	$ 97,374	$ 96,223	$ 95,073	$ 93,923	$ 92,773	$ 91,623	$ 90,473	$ 89,323	$ 88,173	$ 87,023	$ 85,873	$ 84,723	$ 83,573	$ 82,422	$ 81,272	$ 80,122	$ 78,972
TOTAL OTHER LOANS																					
Annual Interest Payment	$ -	$ 13,367	$ 35,700	$ 33,882	$ 32,063	$ 30,245	$ 28,426	$ 26,608	$ 24,790	$ 22,971	$ 21,153	$ 19,334	$ 17,516	$ 15,697	$ 13,879	$ 12,061	$ 10,242	$ 8,424	$ 6,605	$ 4,787	$ 2,969
Annual Principal Payment	-	44,556	121,228	121,228	121,228	121,228	121,228	121,228	121,228	121,228	121,228	121,228	121,228	121,228	121,228	121,228	121,228	121,228	121,228	121,228	121,228
Total Annual Payment	$ -	$ 57,923	$ 156,928	$ 155,110	$ 153,292	$ 151,473	$ 149,655	$ 147,836	$ 146,018	$ 144,199	$ 142,381	$ 140,563	$ 138,744	$ 136,926	$ 135,107	$ 133,289	$ 131,470	$ 129,652	$ 127,834	$ 126,015	$ 124,197

Total Existing Debt Service - All Loans	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
TOTAL WATER LOANS																					
Annual Interest Payment	$ 132,376	$ 144,346	$ 165,028	$ 161,184	$ 157,039	$ 152,369	$ 146,149	$ 140,205	$ 131,260	$ 122,115	$ 112,770	$ 103,026	$ 93,081	$ 83,262	$ 71,809	$ 59,886	$ 47,492	$ 33,924	$ 19,605	$ 4,787	$ 2,969
Annual Principal Payment	254,661	304,217	380,889	380,889	376,491	381,491	386,491	391,491	396,491	401,491	411,491	416,491	321,228	326,228	336,228	346,228	356,228	371,228	381,228	121,228	121,228
Total Annual Payment	$ 387,037	$ 448,564	$ 545,918	$ 542,073	$ 533,530	$ 533,860	$ 532,641	$ 531,696	$ 527,751	$ 523,606	$ 524,262	$ 519,517	$ 414,309	$ 409,491	$ 408,037	$ 406,114	$ 403,720	$ 405,152	$ 400,834	$ 126,015	$ 124,197

North Beach Water District
Comprehensive Rate Study
Capital Improvement Program

Project Costs and O&M Impacts in Year:	2014

No	Description	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Specific Funding Source 1-Enterprise Fund, 2-Grants & Developer Donations
1	**2014 Budget**																						1 Enterprise Fund
2	AMR Meter Replacements	130,000	-	-	-	-	-																1 Enterprise Fund
3	245th Water Main Project	20,000																					1 Enterprise Fund
4	227th Lane Water Main Extension	35,000																					1 Enterprise Fund
5	Water System Plan	61,000																					1 Enterprise Fund
6	Rate Study	30,000																					1 Enterprise Fund
7	5-Yard Dump Truck	40,000																					1 Enterprise Fund
8	Incident Trailer w/ Equipment	12,000																					1 Enterprise Fund
9																							1 Enterprise Fund
10	**DWSRF Loan #121**		-																				1 Enterprise Fund
11	"U" Street Water Main																						1 Enterprise Fund
12	Z Street Water Main																						1 Enterprise Fund
13	Birch Place Water Main																						1 Enterprise Fund
14	**DWSRF Loan #129**		-	-																			1 Enterprise Fund
15	North Wellfield - Wells																						1 Enterprise Fund
16	North Wellfield - Treatment Plant																						1 Enterprise Fund
17	North Wellfield - Booster Station																						1 Enterprise Fund
18	South Wellfield - Wells																						1 Enterprise Fund
19	South Wellfield - Treatment Plant																						1 Enterprise Fund
20																							1 Enterprise Fund
21	**CIP Schedule**																						1 Enterprise Fund
22	M-01 AMR Meter Replacements		525,000																				1 Enterprise Fund
23	S-01 SWF and NWF Wells		1,500,000	500,000																			1 Enterprise Fund
24	D-02 Install fire hydrant at SR 103 and 179th			12,000																			1 Enterprise Fund
25	D-03 Relocate service for "Free by the Sea"			30,000																			1 Enterprise Fund
26	D-04 Add 4 distribution system sample stations			9,000	9,000	9,000	9,000	9,000															1 Enterprise Fund
27	E-01 Construction Equipment			162,000																			1 Enterprise Fund
28	P-01 New booster pumping system at Birch Pl & 227th				250,000																		1 Enterprise Fund
29	D-05 Water main on Ash Pl and Birch Pl					338,000																	1 Enterprise Fund
30	D-01 Water main on 245th Lane					223,000																	1 Enterprise Fund
31	D-13 Water main on 253rd Place				165,000																		1 Enterprise Fund
32	D-08 Water main on Vernon Ave										390,000												1 Enterprise Fund
33	D-09 Water main on Joe John's Rd and U Street												650,000										1 Enterprise Fund
34	D-06 Water main in Tides W Div 1 and Jolly Roger								490,000														1 Enterprise Fund
35	D-07 Water main in Tides W Div 2 and Sea Lake Ranch									480,000													1 Enterprise Fund
36	D-10 Water main on Joe John's Rd and Sandridge Rd														750,000								1 Enterprise Fund
37	D-11 Water main on Sandridge Rd, 227th Pl and 250th																1,100,000						1 Enterprise Fund
38	D-12 Water main on U Street						310,000	310,000															1 Enterprise Fund
39																							1 Enterprise Fund
	Total Capital Projects	**$ 328,000**	**$ 2,025,000**	**$ 713,000**	**$ 424,000**	**$ 570,000**	**$ 319,000**	**$ 319,000**	**$ 490,000**	**$ 480,000**	**$ 390,000**	**$ -**	**$ 650,000**	**$ -**	**$ 750,000**	**$ -**	**$ 1,100,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	
	Projects by Grants / Developer Donations																						
	Projects by Enterprise Fund																						

North Beach Water District
Comprehensive Rate Study
Capital Improvement Program

Project Costs and O&M Impacts in Year:	2014

TOTAL FORECASTED PROJECT COSTS

No	Description	TOTAL ESCALATED COSTS	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
1	**2014 Budget**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	AMR Meter Replacements	134,704	134,704	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	245th Water Main Project	20,724	20,724	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	227th Lane Water Main Extension	36,267	36,267	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Water System Plan	63,207	63,207	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Rate Study	31,086	31,086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	5-Yard Dump Truck	41,448	41,448	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Incident Trailer w/ Equipment	12,434	12,434	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	**DWSRF Loan #121**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	"U" Street Water Main	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	Z Street Water Main	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Birch Place Water Main	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	**DWSRF Loan #129**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	North Wellfield - Wells	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	North Wellfield - Treatment Plant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	North Wellfield - Booster Station	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	South Wellfield - Wells	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	South Wellfield - Treatment Plant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	**CIP Schedule**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	M-01 AMR Meter Replacements	563,685	-	563,685	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	S-01 SWF and NWF Wells	2,166,797	-	1,610,528	556,270	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	D-02 Install fire hydrant at SR 103 and 179th	13,350	-	-	13,350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	D-03 Relocate service for "Free by the Sea"	33,376	-	-	33,376	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	D-04 Add 4 distribution system sample stations	53,821	-	-	10,013	10,375	10,751	11,140	11,543	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	E-01 Construction Equipment	180,231	-	-	180,231	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	P-01 New booster pumping system at Birch Pl & 227th	288,200	-	-	-	288,200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	D-05 Water main on Ash Pl and Birch Pl	403,747	-	-	-	-	403,747	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	D-01 Water main on 245th Lane	266,377	-	-	-	-	266,377	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	D-13 Water main on 253rd Place	190,212	-	-	-	190,212	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	D-08 Water main on Vernon Ave	556,480	-	-	-	-	-	-	-	-	-	556,480	-	-	-	-	-	-	-	-	-	-	-
33	D-09 Water main on Joe John's Rd and U Street	995,806	-	-	-	-	-	-	-	-	-	-	-	995,806	-	-	-	-	-	-	-	-	-
34	D-06 Water main in Tides W Div 1 and Jolly Roger	651,184	-	-	-	-	-	-	-	651,184	-	-	-	-	-	-	-	-	-	-	-	-	-
35	D-07 Water main in Tides W Div 2 and Sea Lake Ranch	660,979	-	-	-	-	-	-	-	-	660,979	-	-	-	-	-	-	-	-	-	-	-	-
36	D-10 Water main on Joe John's Rd and Sandridge Rd	1,233,672	-	-	-	-	-	-	-	-	-	-	-	-	-	1,233,672	-	-	-	-	-	-	-
37	D-11 Water main on Sandridge Rd, 227th Pl and 250th	1,942,710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,942,710	-	-	-	-	-
38	D-12 Water main on U Street	781,286	-	-	-	-	-	383,701	397,586	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total Capital Projects	**$11,321,784**	**$ 339,870**	**$ 2,174,212**	**$ 793,241**	**$ 488,787**	**$ 680,875**	**$ 394,840**	**$ 409,129**	**$ 651,184**	**$ 660,979**	**$ 556,480**	**$ -**	**$ 995,806**	**$ -**	**$ 1,233,672**	**$ -**	**$ 1,942,710**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
	Projects by Grants / Developer Donations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Projects by Enterprise Fund	11,321,784	339,870	2,174,212	793,241	488,787	680,875	394,840	409,129	651,184	660,979	556,480	-	995,806	-	1,233,672	-	1,942,710	-	-	-	-	-

North Beach Water District
Comprehensive Rate Study
Revenue Requirements Analysis

Cash Flow Sufficiency Test	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
EXPENSES																					
Cash Operating Expenses	$ 864,800	$ 922,400	$ 888,206	$ 910,309	$ 932,523	$ 955,335	$ 1,058,764	$ 996,825	$ 1,021,535	$ 1,046,913	$ 1,072,977	$ 1,099,745	$ 1,127,237	$ 1,155,473	$ 1,184,473	$ 1,214,258	$ 1,244,849	$ 1,276,269	$ 1,308,541	$ 1,341,687	$ 1,375,732
Existing Debt Service	387,037	448,564	545,918	542,073	533,530	533,860	532,641	531,696	527,751	523,606	524,262	519,517	414,309	409,491	408,037	406,114	403,720	405,152	400,834	126,015	124,197
New Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rate Funded System Reinvestment	316,000	316,000	316,000	344,000	372,000	395,000	420,000	440,000	470,000	500,000	530,000	560,000	690,000	720,000	740,000	790,000	820,000	850,000	890,000	1,200,000	1,220,000
Total Expenses	$ 1,567,837	$ 1,686,964	$ 1,750,124	$ 1,796,382	$ 1,838,053	$ 1,884,196	$ 2,011,404	$ 1,968,521	$ 2,019,286	$ 2,070,520	$ 2,127,239	$ 2,179,262	$ 2,231,547	$ 2,284,964	$ 2,332,510	$ 2,410,372	$ 2,468,570	$ 2,531,421	$ 2,599,374	$ 2,667,702	$ 2,719,928
REVENUES																					
Retail Rate Revenue	$ 1,576,410	$ 1,579,301	$ 1,582,203	$ 1,585,115	$ 1,588,037	$ 1,590,970	$ 1,593,913	$ 1,596,867	$ 1,599,832	$ 1,602,807	$ 1,605,792	$ 1,608,789	$ 1,611,796	$ 1,614,813	$ 1,617,841	$ 1,620,880	$ 1,623,930	$ 1,626,990	$ 1,630,061	$ 1,633,143	$ 1,636,236
Other Non Rate Revenue	117,800	124,500	124,824	125,148	125,474	125,800	126,127	126,455	126,784	127,113	127,444	127,775	128,107	128,440	128,774	129,109	129,445	129,781	130,119	130,457	130,796
Rate Stabilization Transfer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating Fund & Debt Reserve Fund Interest Earnings	1,800	3,000	2,461	2,461	2,461	2,461	2,461	2,326	2,450	2,461	2,461	2,461	2,461	2,461	2,461	2,461	2,461	2,461	2,461	2,461	2,461
Total Revenue	$ 1,696,010	$ 1,706,801	$ 1,709,487	$ 1,712,724	$ 1,715,972	$ 1,719,231	$ 1,722,501	$ 1,725,648	$ 1,729,065	$ 1,732,381	$ 1,735,697	$ 1,739,025	$ 1,742,364	$ 1,745,715	$ 1,749,077	$ 1,752,450	$ 1,755,836	$ 1,759,233	$ 1,762,641	$ 1,766,061	$ 1,769,493
NET CASH FLOW (DEFICIENCY)	**$ 128,173**	**$ 19,838**	**$ (40,636)**	**$ (83,658)**	**$ (122,081)**	**$ (164,965)**	**$ (288,903)**	**$ (242,873)**	**$ (290,221)**	**$ (338,139)**	**$ (391,541)**	**$ (440,237)**	**$ (489,183)**	**$ (539,249)**	**$ (583,434)**	**$ (657,921)**	**$ (712,734)**	**$ (772,189)**	**$ (836,733)**	**$ (901,641)**	**$ (950,435)**
% of Rate Revenue	-8.13%	-1.26%	2.57%	5.28%	7.69%	10.37%	18.13%	15.21%	18.14%	21.10%	24.38%	27.36%	30.35%	33.39%	36.06%	40.59%	43.89%	47.46%	51.33%	55.21%	58.09%

Coverage Sufficiency Test	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
EXPENSES																					
Total Cash Operating Expenses (less Capital Outlay)	$ 864,800	$ 922,400	$ 888,206	$ 910,309	$ 932,523	$ 955,335	$ 1,058,764	$ 996,825	$ 1,021,535	$ 1,046,913	$ 1,072,977	$ 1,099,745	$ 1,127,237	$ 1,155,473	$ 1,184,473	$ 1,214,258	$ 1,244,849	$ 1,276,269	$ 1,308,541	$ 1,341,687	$ 1,375,732
Revenue Bond Debt Service	271,060	275,190	274,065	272,565	270,765	273,440	274,565	275,965	274,365	272,565	275,565	273,165	275,565	272,565	272,930	272,825	272,250	275,500	273,000	-	-
Revenue Bond Coverage Requirement at 1.25	67,765	68,798	68,516	68,141	67,691	68,360	68,641	68,991	68,591	68,141	68,891	68,291	68,891	68,141	68,233	68,206	68,063	68,875	68,250	-	-
Total Expenses	$ 1,203,625	$ 1,266,388	$ 1,230,787	$ 1,251,015	$ 1,270,979	$ 1,297,135	$ 1,401,970	$ 1,341,781	$ 1,364,491	$ 1,387,619	$ 1,417,433	$ 1,441,201	$ 1,471,694	$ 1,496,179	$ 1,525,636	$ 1,555,289	$ 1,585,162	$ 1,620,644	$ 1,649,791	$ 1,341,687	$ 1,375,732
ALLOWABLE REVENUES																					
Rate Revenue	$ 1,576,410	$ 1,579,301	$ 1,582,203	$ 1,585,115	$ 1,588,037	$ 1,590,970	$ 1,593,913	$ 1,596,867	$ 1,599,832	$ 1,602,807	$ 1,605,792	$ 1,608,789	$ 1,611,796	$ 1,614,813	$ 1,617,841	$ 1,620,880	$ 1,623,930	$ 1,626,990	$ 1,630,061	$ 1,633,143	$ 1,636,236
Other Revenue	117,800	124,500	124,824	125,148	125,474	125,800	126,127	126,455	126,784	127,113	127,444	2,461	2,461	2,461	2,461	2,461	2,461	2,461	2,461	2,461	2,461
GFC Revenue	15,000	15,000	9,634	9,659	9,684	9,709	9,734	9,759	9,785	9,810	9,836	9,861	9,887	9,913	9,938	9,964	9,990	10,016	10,042	10,068	10,094
Interest Earnings - All Funds	9,789	11,210	5,573	4,342	4,052	3,297	3,424	3,351	2,900	2,501	2,484	4,134	3,022	5,143	3,824	6,125	2,950	5,431	8,004	10,686	14,258
Total Revenue	$ 1,718,999	$ 1,730,012	$ 1,722,232	$ 1,724,263	$ 1,727,246	$ 1,729,776	$ 1,733,198	$ 1,736,432	$ 1,739,300	$ 1,742,231	$ 1,745,556	$ 1,625,245	$ 1,627,166	$ 1,632,329	$ 1,634,064	$ 1,639,431	$ 1,639,331	$ 1,644,899	$ 1,650,568	$ 1,656,359	$ 1,663,049
Coverage Realized	3.15	2.93	3.04	2.99	2.94	2.83	2.46	2.68	2.62	2.55	2.44	1.92	1.81	1.75	1.65	1.56	1.45	1.34	1.25	n/a	n/a
COVERAGE SURPLUS (DEFICIENCY)	**$ 515,374**	**$ 463,624**	**$ 491,445**	**$ 473,248**	**$ 456,267**	**$ 432,640**	**$ 331,228**	**$ 394,651**	**$ 374,809**	**$ 354,612**	**$ 328,123**	**$ 184,044**	**$ 155,472**	**$ 136,150**	**$ 108,429**	**$ 84,141**	**$ 54,169**	**$ 24,254**	**$ 777**	**$ 314,672**	**$ 287,318**

Maximum Revenue Deficiency	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Sufficiency Test Driving the Deficiency	*None*	*None*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*
Maximum Deficiency From Tests	$ -	$ -	$ 40,636	$ 83,658	$ 122,081	$ 164,965	$ 288,903	$ 242,873	$ 290,221	$ 338,139	$ 391,541	$ 440,237	$ 489,183	$ 539,249	$ 583,434	$ 657,921	$ 712,734	$ 772,189	$ 836,733	$ 901,641	$ 950,435
less: Net Revenue From Prior Rate Increases	-	-	(37,566)	(76,211)	(115,964)	(156,857)	(198,920)	(242,185)	(286,685)	(332,453)	(379,525)	(427,936)	(477,723)	(528,923)	(581,575)	(635,718)	(691,393)	(748,643)	(807,510)	(868,038)	(930,272)
Revenue Deficiency	$ -	$ -	$ 3,070	$ 7,447	$ 6,117	$ 8,108	$ 89,983	$ 688	$ 3,536	$ 5,685	$ 12,016	$ 12,301	$ 11,460	$ 10,326	$ 1,859	$ 22,204	$ 21,341	$ 23,546	$ 29,223	$ 33,603	$ 20,163
Plus: Adjustment for State Excise Tax	-	-	163	394	324	429	4,765	36	187	301	636	651	607	547	98	1,176	1,130	1,247	1,547	1,779	1,068
Total Revenue Deficiency	**$ -**	**$ -**	**$ 3,233**	**$ 7,841**	**$ 6,440**	**$ 8,537**	**$ 94,748**	**$ 724**	**$ 3,724**	**$ 5,986**	**$ 12,652**	**$ 12,953**	**$ 12,066**	**$ 10,873**	**$ 1,958**	**$ 23,379**	**$ 22,471**	**$ 24,793**	**$ 30,771**	**$ 35,382**	**$ 21,230**

Rate Increases	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Rate Revenue with no Increase	$ 1,576,410	$ 1,579,301	$ 1,582,203	$ 1,585,115	$ 1,588,037	$ 1,590,970	$ 1,593,913	$ 1,596,867	$ 1,599,832	$ 1,602,807	$ 1,605,792	$ 1,608,789	$ 1,611,796	$ 1,614,813	$ 1,617,841	$ 1,620,880	$ 1,623,930	$ 1,626,990	$ 1,630,061	$ 1,633,143	$ 1,636,236
Revenues from Prior Rate Increases	-	-	39,555	80,246	122,105	165,163	209,453	255,009	301,865	350,058	399,622	450,597	503,020	556,931	612,371	669,381	728,005	788,286	850,270	914,003	979,533
Rate Revenue Before Rate Increase (Incl. previous increases)	1,576,410	1,579,301	1,621,758	1,665,361	1,710,142	1,756,133	1,803,367	1,851,876	1,901,697	1,952,864	2,005,415	2,059,385	2,114,815	2,171,744	2,230,212	2,290,261	2,351,935	2,415,276	2,480,331	2,547,146	2,615,769
Required Annual Rate Increase	0.00%	0.00%	0.20%	0.47%	0.38%	0.49%	5.25%	0.04%	0.20%	0.31%	0.63%	0.63%	0.57%	0.50%	0.09%	1.02%	0.96%	1.03%	1.24%	1.39%	0.81%
Number of Months New Rates Will Be In Effect	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Info: Percentage Increase to Generate Required Revenue	*0.00%*	*0.00%*	*0.20%*	*0.47%*	*0.38%*	*0.49%*	*5.25%*	*0.04%*	*0.20%*	*0.31%*	*0.63%*	*0.63%*	*0.57%*	*0.50%*	*0.09%*	*1.02%*	*0.96%*	*1.03%*	*1.24%*	*1.39%*	*0.81%*
Policy Induced Rate Increases	0.00%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
ANNUAL RATE INCREASE	**0.00%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**	**2.50%**
CUMULATIVE RATE INCREASE	**0.00%**	**2.50%**	**5.06%**	**7.69%**	**10.38%**	**13.14%**	**15.97%**	**18.87%**	**21.84%**	**24.89%**	**28.01%**	**31.21%**	**34.49%**	**37.85%**	**41.30%**	**44.83%**	**48.45%**	**52.16%**	**55.97%**	**59.87%**	**63.86%**

Impacts of Rate Increases	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Rate Revenues After Rate Increase	$ 1,576,410	$ 1,618,784	$ 1,662,302	$ 1,706,995	$ 1,752,896	$ 1,800,036	$ 1,848,451	$ 1,898,173	$ 1,949,240	$ 2,001,686	$ 2,055,550	$ 2,110,870	$ 2,167,686	$ 2,226,038	$ 2,285,967	$ 2,347,518	$ 2,410,733	$ 2,475,658	$ 2,542,339	$ 2,610,825	$ 2,681,163
Full Year Rate Revenues After Rate Increase	*1,576,410*	*1,618,784*	*1,662,302*	*1,706,995*	*1,752,896*	*1,800,036*	*1,848,451*	*1,898,173*	*1,949,240*	*2,001,686*	*2,055,550*	*2,110,870*	*2,167,686*	*2,226,038*	*2,285,967*	*2,347,518*	*2,410,733*	*2,475,658*	*2,542,339*	*2,610,825*	*2,681,163*
Additional State and City Taxes Due to Rate Increases	-	1,986	4,028	6,129	8,291	10,514	12,801	15,153	17,572	20,060	22,618	25,250	27,956	30,738	33,600	36,543	39,568	42,680	45,878	49,168	52,549
Net Cash Flow After Rate Increase	128,173	57,335	35,435	32,093	34,487	33,588	(47,166)	43,281	41,615	40,681	35,598	36,594	38,752	41,237	51,092	32,174	34,501	33,800	29,666	26,873	41,943
Coverage After Rate Increase	3.15	3.07	3.32	3.41	3.51	3.56	3.34	3.72	3.83	3.94	3.99	3.67	3.73	3.88	3.97	4.09	4.19	4.26	4.43	n/a	n/a

North Beach Water District
Comprehensive Rate Study
Fund Activity

Funds	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
OPERATION FUND Perform Transfer?	Yes																				
Beginning Balance	$ 450,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 452,834	$ 496,114	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000
plus: Net Cash Flow after Rate Increase	128,173	57,335	35,435	32,093	34,487	33,588	(47,166)	43,281	41,615	40,681	35,598	36,594	38,752	41,237	51,092	32,174	34,501	33,800	29,666	26,873	41,943
less: Transfer of Surplus to Capital Fund	(78,173)	(57,335)	(35,435)	(32,093)	(34,487)	(33,588)	-	-	(37,729)	(40,681)	(35,598)	(36,594)	(38,752)	(41,237)	(51,092)	(32,174)	(34,501)	(33,800)	(29,666)	(26,873)	(41,943)
Ending Balance	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 452,834**	**$ 496,114**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**	**$ 500,000**
Minimum Target Balance	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*	*$ 450,000*
Maximum Funds to be Kept as Operating Reserves	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*
Info: No of Days of Cash Operating Expenses	*211*	*198*	*206*	*200*	*196*	*191*	*157*	*182*	*179*	*174*	*171*	*166*	*162*	*158*	*154*	*150*	*147*	*143*	*140*	*136*	*133*
CAPITAL FUND																					
Beginning Balance	$ 2,785,143	$ 2,862,435	$ 1,084,768	$ 655,707	$ 554,552	$ 291,439	$ 335,731	$ 357,299	$ 156,900	$ 13,885	$ 7,937	$ 583,393	$ 195,716	$ 934,916	$ 475,075	$ 1,277,468	$ 170,560	$ 1,035,540	$ 1,932,326	$ 2,867,577	$ 4,112,744
plus: Rate Funded System Reinvestment	316,000	316,000	316,000	344,000	372,000	395,000	420,000	440,000	470,000	500,000	530,000	560,000	690,000	720,000	740,000	790,000	820,000	850,000	890,000	1,200,000	1,220,000
plus: Transfers from Operating Fund	78,173	57,335	35,435	32,093	34,487	33,588	-	-	37,729	40,681	35,598	36,594	38,752	41,237	51,092	32,174	34,501	33,800	29,666	26,873	41,943
plus: General Facility Charges	15,000	15,000	9,634	9,659	9,684	9,709	9,734	9,759	9,785	9,810	9,836	9,861	9,887	9,913	9,938	9,964	9,990	10,016	10,042	10,068	10,094
plus: Grants/ Donations/ CIAC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Additional Proceeds (Costs)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Transfer from Rate Stabilization Account	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Revenue Bond Proceeds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: PWTF Loans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Other Low Interest Loan Proceeds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Interest Earnings	7,989	8,210	3,111	1,881	1,591	836	963	1,025	450	40	23	1,673	561	2,682	1,363	3,664	489	2,970	5,543	8,225	11,797
Total Funding Sources	**$ 3,202,305**	**$ 3,258,980**	**$ 1,448,947**	**$ 1,043,339**	**$ 972,314**	**$ 730,571**	**$ 766,428**	**$ 808,084**	**$ 674,864**	**$ 564,416**	**$ 583,393**	**$ 1,191,522**	**$ 934,916**	**$ 1,708,747**	**$ 1,277,468**	**$ 2,113,270**	**$ 1,035,540**	**$ 1,932,326**	**$ 2,867,577**	**$ 4,112,744**	**$ 5,396,578**
less: Capital Expenditures	(339,870)	(2,174,212)	(793,241)	(488,787)	(680,875)	(394,840)	(409,129)	(651,184)	(660,979)	(556,480)	-	(995,806)	-	(1,233,672)	-	(1,942,710)	-	-	-	-	-
Ending Capital Fund Balance	**$ 2,862,435**	**$ 1,084,768**	**$ 655,707**	**$ 554,552**	**$ 291,439**	**$ 335,731**	**$ 357,299**	**$ 156,900**	**$ 13,885**	**$ 7,937**	**$ 583,393**	**$ 195,716**	**$ 934,916**	**$ 475,075**	**$ 1,277,468**	**$ 170,560**	**$ 1,035,540**	**$ 1,932,326**	**$ 2,867,577**	**$ 4,112,744**	**$ 5,396,578**
DEBT RESERVE																					
Beginning Balance	$ 358,000	$ 358,000	$ 358,000	$ 358,000	$ 358,000	$ 358,000	$ 358,000	$ 358,000	$ 358,000	$ 358,000	$ 358,000	$ 358,000	$ 358,000	$ 358,000	$ 358,000	$ 358,000	$ 358,000	$ 358,000	$ 358,000	$ 358,000	$ 358,000
plus: Reserve Funding from New Debt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
less: Use of Reserves for Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ending Balance	**$ 358,000**	**$ 358,000**	**$ 358,000**	**$ 358,000**	**$ 358,000**	**$ 358,000**	**$ 358,000**	**$ 358,000**	**$ 358,000**	**$ 358,000**	**$ 358,000**	**$ 358,000**	**$ 358,000**	**$ 358,000**	**$ 358,000**	**$ 358,000**	**$ 358,000**	**$ 358,000**	**$ 358,000**	**$ 358,000**	**$ 358,000**
Minimum Target Balance	*$ 275,965*	*$ 275,965*	*$ 275,965*	*$ 275,965*	*$ 275,965*	*$ 275,965*	*$ 275,965*	*$ 275,965*	*$ 275,565*	*$ 275,565*	*$ 275,565*	*$ 275,565*	*$ 275,565*	*$ 275,500*	*$ 275,500*	*$ 275,500*	*$ 275,500*	*$ 275,500*	*$ 273,000*	*$ -*	*$ -*
RATE STABILIZATION RESERVE																					
Beginning Balance	$ 1,003,000	$ 1,003,000	$ 1,003,000	$ 1,003,000	$ 1,003,000	$ 1,003,000	$ 1,003,000	$ 1,003,000	$ 1,003,000	$ 1,003,000	$ 1,003,000	$ 1,003,000	$ 1,003,000	$ 1,003,000	$ 1,003,000	$ 1,003,000	$ 1,003,000	$ 1,003,000	$ 1,003,000	$ 1,003,000	$ 1,003,000
less: Transfer to Operating Fund	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
less: Transfer to Capital Fund	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ending Balance	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**	**$ 1,003,000**

APPENDIX L

SEPA CHECKLIST

NOTICE OF DETERMINATION OF NONSIGNIFICANCE

North Beach Water District issued a determination of non-significance (DNS) under the State Environmental Policy Act Rules (Chapter 197-11 WAC) for the following project:

2014 Water System Plan Update.

After a review of a completed environmental checklist and other information on file with the District, North Beach Water District has determined this proposal will not have a probable significant adverse impact on the environment.

Copies of the DNS are available at no charge from North Beach Water District 25902 Vernon Avenue Suite C, PO Box 618 Ocean Park, WA 98640 360.665.4144. Copies of the DNS may be downloaded from the District's website at www.northbeachwater.com.

The public is invited to comment on this DNS by submitting written comments no later than April 15, 2015 to William Neal at PO Box 618 Ocean Park, WA 98640 or by public comment at a public hearing to be held on 6:00 PM Monday, April 20, 2015 at 25902 Vernon Avenue Suite D Ocean Park, WA 98640.

DETERMINATION OF NONSIGNIFICANCE (DNS)
WAC 197-11-970

Description of proposal:

The Water System Plan (Plan) is being prepared to meet the requirement of WAC 246-290-100 (Planning Requirements) and as further detailed in the Washington State Department of Health (DOH) Water Systems Planning Handbook. The Plan will also address the needs and concerns of the North Beach Water District (NBWD) Board of Commissioners (Board) and Management. Additionally, WAC 246-290-100(4)(k)(i) requires the Plan document State Environmental Protection Act (SEPA) compliance. The plan may be viewed at the following website:

www.northbeachwater.com

The Plan addresses the following elements:

- **Water System Description** including ownership and management, system background, policies and procedures, water rights, inventory of existing facilities, planning documents, existing services characteristics, District's service area, customer compliant management;
- **Basic Planning Data** including historic water use data, water use forecasts, historic water source production and source production forecasts, to ensure current and future water system capabilities will be met;
- **Water System Analysis** including water quality analysis, System description and analysis, water rights analysis, summary of deficiencies, selection and justification of proposed improvements;
- **Water Use Efficiency** including an evaluation of past water conservation efforts and describe NBWD's future water conservation goals and measures;
- **Wellhead Protection Program** including a review of DOH Susceptibility Assessments of District water wells and delineations of the Districts Wellhead Protection Area;
- **Operation and Maintenance Program** including an evaluation of the District's operation and maintenance program and their ability to assure satisfactory management of the water system operations in accordance with WAC 246-290;
- **Distribution Facilities Design and Construction Standards** including documentation of the District's design and construction standards establishing the District's ability to obtain DOH

approval to utilize the alternate review process for construction of new and replaced water distribution facilities;
- **Capital Improvement Program** including descriptions and cost estimates for capital improvement projects to address deficiencies identified in previous chapters;
- **Financial Plan** including historical and current data related to the financial health of the District demonstrating the District's ability to meet all of their current and future financial responsibilities. Furthermore, a review of the District's current and future rate structure related to adequacy, promotion of conservation and affordability will be performed.

Proponent/Applicant:

North Beach Water District
William Neal, General Manager
25902 Vernon Avenue
PO Box 618
Ocean Park, WA 98640
360.665.4144

Location of proposal, including street address, if any:

The North Beach Water District is located in Pacific County, in the unincorporated community of Ocean Park.

Lead Agency:

North Beach Water District

NBWD has determined that adopting and implementing the Plan does not have a probable significant adverse impact on the environment. Therefore Washington State law[i] does not require an environmental impact statement (EIS). This decision was made after review of a completed environmental check list and other information on file with NBWD. This information is available to the public on request.

NBWD issued this DNS according to state rules[ii] NBWD will **not act on this proposal for 14 days** from the date we issue the DNS. Agencies, affected tribes, and members of the public are invited to comment on this proposal or DNS. We must receive your comments within 14 days of the date of this letter. This means we must receive your comments by **April 15, 2015.**

Method of Comment:

The following procedures shall govern the method of comment on NBWD SEPA proposals. Comments received through these procedures are part of the official SEPA record for this proposal.

You can submit your comments by any of the following ways:

- Email to bneal@northbeachwater.com
- Fax to 360.665.4641
- USPS to:
  PO Box 618
  Ocean Park, WA 98640
- UPS, FedEx, or hand deliver to:
  25902 Vernon Avenue Suite C
  Ocean Park, WA 98640

Responsible Official:

William Neal

Position/ Title:

General Manager

Address:

PO Box 618 Ocean Park, WA 98640

After the comment period closes, applicants may view the updated status of the proposal on the NBWD website: www.northbeachwater.com. Once the status is posted as final, applicants and permittees may take action on the proposal. When a proposal is modified or withdrawn, notices will be given in accordance with state law.

If you have any questions about this DNS or the details of the proposal, contact William Neal at the address, e-mail, or fax number above.

Date of Issue: March 30, 2015

Signature: _____

William Neal, NBWD General Manager

[i] RCW 43.21C.030(2)(c)

[ii] WAC 197-11-340(2)

ENVIRONMENTAL CHECKLIST

A. BACKGROUND

1. Name of proposed project, if applicable:

Water System Plan Update

2. Name of applicant:

North Beach Water District

3. Address and phone number of applicant and contact person:

William Neal, General Manager
North Beach Water District
Po Box 618
Ocean Park, Washington 98640
(360) 665-4144

4. Date checklist prepared:

February 2015

5. Agency requesting checklist:

Washington State Department of Health

6. Proposed timing or schedule (including phasing, if applicable):

Approval of Draft Plan:	March 2015
Adoption of Final Plan:	July, 2015
Planning Horizon:	Six Years

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

This plan establishes recommended capital improvements for North Beach Water District water system, which may be implemented as individual projects at the District's discretion.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

None Known

9. **Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.**

   None Known

10. **List any government approvals or permits that will be needed for your proposal, if known.**

    Washington State Department of Health: Water System Plan Approval
    Washington State Department of Ecology: Water Rights Concurrence
    Pacific County: Water System Plan Consistency Statement

11. **Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)**

    The Water System Plan is a planning document for the North Beach Water District water system, which has been prepared in accordance with the requirements of WAC 246-290. The plan addresses the ability of the water system to provide potable water supply within the District's service area. The plan identifies recommended water system capital improvement projects according to a prioritization schedule. These identified projects are anticipated to be necessary to provide adequate water service for anticipated growth and development over a 20-year planning horizon. As required, each individual water system capital improvement project will be subject to environmental evaluation and assessment as the projects are implemented in their various stages.

12. **Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.**

    The Water System Plan has been developed to address the anticipated potable water service needs for the District's water service area.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site (check one):

☐ flat, ☐ rolling, ☒ hilly, ☐ steep slope, ☐ other. . . .

b. What is the steepest slope on the site (approximate percent slope)?

Elevations range from a low of approximately Sea Level adjacent to the Pacific Ocean, to a high of approximately 45 feet. Slopes of any magnitude fall within these elevations and are very localized.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

The soils on the North Beach peninsula are composed of deeply weathered and eroded basalt-derived fine sand, gravel, and clay. The upper soil strata is predominately 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 700 feet.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

No grading or filling is expressly proposed by the Water System Plan. Grading and or filling associated with individual recommended capital improvement projects may be required during the construction and implementation of individual projects. Such impacts will be evaluated on a project specific basis.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Construction associated with recommended water system capital improvement projects will include protective measures for erosion control where necessary.

Appropriate best management, erosion control, and mitigative measures will be determined on a project specific basis prior to the actual time of construction.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

To be determined on a project specific basis prior to the actual time of construction for recommended water system capital improvement projects.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

No earth impacts are anticipated as a result of Water System Plan adoption. Project specific impacts will be evaluated on a project specific basis.

2. Air

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Recommended water system capital improvement construction projects should not result in impacts to air quality with the possible exception of dust and vehicle emissions from construction equipment. Specific impacts will be evaluated on a project specific basis.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

None.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

No air impacts are anticipated as a result of Water System Plan adoption. Project specific impacts will be evaluated on a project specific basis.

3. **Water**

a. **Surface Water:**

1) **Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.**

Yes, there are several small lakes in the District's water service area, including Loomis Lake, Lake Rushton, and other small un-named lakes and ponds, wetland areas, and man-made canals. The Pacific Ocean is immediately to the west of the District and Willapa Bay to the east of the water service area.

2) **Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.**

No. The proximity of recommended improvements to surface water will be more specifically evaluated on a project specific basis.

3) **Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.**

None anticipated.

4) **Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.**

No.

5) **Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.**

No.

6) **Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.**

No.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

The District's water system uses groundwater supplies exclusively. Groundwater is currently and will continue to be withdrawn from six existing active groundwater wells, and possible future groundwater wells, under existing water rights. Wells are located in a wellfield on 272nd Street between U Street and Sandridge Road and a wellfield on 255th Lane east of U Street. No new water rights are anticipated to be necessary within the planning horizon.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

The water treatment discharges filter backwash water to shallow infiltration ponds. The backwash water contains insoluble particles of iron and manganese oxides, naturally occurring in the local groundwater and removed from the water by a filtration process. These particles are retained in the sandy soil of the percolation basins and clean water percolates to the water table. The backwash water is periodically monitored to ensure its quality. Accumulated iron and manganese oxide particles are periodically removed from the backwash basins. The materials are inorganic, odorless, and are generally suitable for land spreading as a soil amendment.

The District's water system served a total of 3,194 customers as of the end of 2013. The Water System Plan projects a total of 3,989 connections by the end of 2035, and 4,250 total connections at system buildout. All connections are on septic tank/drainfield wastewater disposal systems.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Not Applicable. Project specific impacts will be evaluated on a project specific basis.

2) **Could waste materials enter ground or surface waters? If so, generally describe.**

No.

3) **Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.**

No.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

None.

4. Plants

a. Check the types of vegetation found on the site:

- ☒ Deciduous tree: alder, maple, aspen, other
- ☒ Evergreen tree: fir, cedar, pine, other
- ☒ Shrubs
- ☒ Grass
- ☐ Pasture
- ☒ Crop or grain
- ☒ Wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
- ☒ Water plants: water lily, eelgrass, milfoil, other
- ☐ Other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

None. Project specific impacts will be evaluated on a project specific basis.

c. List threatened and endangered species known to be on or near the site.

To be determined on a project specific basis.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

To be determined on a project specific basis.

e. List all noxious weeds and invasive species known to be on or near the site.

To be determined on a project specific basis.

5. Animals

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. Examples include:

☐ Not applicable.
☒ Birds: hawk, heron, eagle, songbirds, other:
☒ Mammals: deer, bear, elk, beaver, other:
☒ Fish: bass, salmon, trout, herring, shellfish, other;

The Washington Department Fish and Wildlife (WDFW) provided maps and data sheets relating to fish and bird species in the vicinity of North Beach Water District. The maps and data show numerous mollusk and shellfish species that reside on the west and east coastline of the North Beach Peninsula.

"Regular large concentrations" of Trumpeter Swan and Tundra Swan were noted, along with "regular large concentrations" of wintering waterfowl including mallards, pintails, bufflehead, teal, and Canada geese. In 1982 one "breeding occurrence" was noted for great blue heron and in 1998 an "individual occurrence" was noted for peregrine falcon.

Of the bird species noted above, only great blue heron and peregrine falcon are listed by Washington State as "sensitive species" and federally listed as "priority" species. However, sensitive and priority species receive no protection under the Endangered Species Act (ESA). In addition, the great blue heron and peregrine falcon occurrences were over a mile from the North Beach Water District water service area.

Deer, squirrels, mice, rabbits and other common wild mammals are common in the area. Black bears have been occasionally reported in the area. No known rare or endangered mammals are known in the area.

Numerous fish species are common in the Pacific Ocean and in Willapa Bay near the project site.

b. List any threatened and endangered species known to be on or near the site.

None known.

c. Is the site part of a migration route? If so, explain.

The entire Washington Coast and Puget Sound basin is a part of the Pacific Flyway.

d. Proposed measures to preserve or enhance wildlife, if any:

None Required.

e. List any invasive animal species known to be on or near the site.

None known.

6. Energy and natural resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

All water treatment, pumping and operations equipment, building lighting and heating is accomplished with electrical energy. Electrical power is provided by Pacific County PUD.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

The District's water system plan addresses Water Use Efficiency, including Water Use Efficiency Goals and Measures adopted by the District's Board of Commissioners. Since all at the District's water system water is pumped using electrical energy, all water conservation is directly related to energy conservation.

7. Environmental health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

This will need to be evaluated on a case by case basis for individual projects as they are implemented.

1) Describe any known or possible contamination at the site from present or past uses.

None known.

2) **Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.**

None known.

3) **Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.**

No.

4) **Describe special emergency services that might be required.**

None.

5) **Proposed measures to reduce or control environmental health hazards, if any:**

None Required

b. **Noise**

1) **What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?**

None anticipated.

2) **What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.**

Project specific impacts will be evaluated on a project specific basis.

3) **Proposed measures to reduce or control noise impacts, if any:**

None.

8. **Land and shoreline use**

a. **What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.**

A variety of land uses exist in the District's water service area. Land uses are identified in Figure 1-13 in the water system plan. The predominant land use is identified as General Rural. Other land uses in or adjacent to the area are Community Crossroads and Public Reserve. The majority of the service area has been subdivided for residential development.

b. **Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?**

No agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal.

1) **Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:**

No.

c. **Describe any structures on the site.**

There are approximately 2,570 residential structures, 105 commercial structures in the District's water service area.

d. **Will any structures be demolished? If so, what?**

No.

e. **What is the current zoning classification of the site?**

Zoning within the District's water service area include Restricted Residential (R1), General Residential (R2), Rural Residential (RR), Community Commercial (CC), and Resort (R3).

f. **What is the current comprehensive plan designation of the site?**

Pacific County Comprehensive Plan designations within the District's water service area include General Rural, Community Crossroads, and Public Reserve.

g. If applicable, what is the current shoreline master program designation of the site?

Not Applicable.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

No.

i. Approximately how many people would reside or work in the completed project?

It is estimated that the current residential population of the District's water service area is approximately 4,010. In addition is it estimated that approximately 3,000 individuals use the system seasonally, and up to 10,000 transient users may visit per month. The water system plan projects occupancy to increase by approximately 20 percent by 2035, and by 33 percent by system buildout.

j. Approximately how many people would the completed project displace?

None.

k. Proposed measures to avoid or reduce displacement impacts, if any:

None.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The District must obtain a concurrently statement from the Pacific County Planning Department, specifically stating that the water system plan is consistent with the county land use plans.

m. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any:

None.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

The proposal will not provide any high, middle or low income housing. The Water system plan does, however, provide planning for the water supply needs for all housing within the District's water service area.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

None.

c. Proposed measures to reduce or control housing impacts, if any:

None.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

Not Applicable,

b. What views in the immediate vicinity would be altered or obstructed?

Not Applicable.

c. Proposed measures to reduce or control aesthetic impacts, if any:

None

11. Light and glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Not Applicable.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

Not Applicable.

c. What existing off-site sources of light or glare may affect your proposal?

Not Applicable.

d. Proposed measures to reduce or control light and glare impacts, if any:

None.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

Beach, ocean, wildlife refuge, golf course, lakes, camping, fishing, picnic grounds, play fields.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

None.

13. Historic and cultural preservation

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers located on or near the site? If so, specifically describe.

No.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

This will be evaluated on a project specific basis.

c. **Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.**

Assessment will be completed on a project specific basis.

d. **Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.**

This will be evaluated on a project specific basis.

14. Transportation

a. **Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.**

The District's water service area is served by a number of County Roads as shown in the Water System Plan Figures 1-11 and 1-12.

b. **Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?**

The Pacific Transit System stops at Jacks County Store on Vernon Avenue and also at the Post Office. Pacific Transit will stop for citizens along the road who wave their hand and where there is enough space for the bus to pull over.

c. **How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?**

Not applicable

d. **Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).**

No.

e. **Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.**

No.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

Not applicable.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

No.

h. Proposed measures to reduce or control transportation impacts, if any:

None.

15. Public services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

No.

b. Proposed measures to reduce or control direct impacts on public services, if any.

None.

16. Utilities

a. Check utilities currently available at the site:

- ☒ electricity
- ☐ natural gas
- ☒ water
- ☒ refuse service
- ☐ sanitary service
- ☒ septic system
- ☐ other:

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Electrical power is provided by Pacific County PUD. Water is provided by the District. Septic systems are the responsibility of individual property owners.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: _____

Name of signee: William Ward

Position and Agency/Organization: General Manager

Date Submitted: 3/30/2015

D. SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. **How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?**

   Not applicable.

   Proposed measures to avoid or reduce such increases are:

   Not applicable.

2. **How would the proposal be likely to affect plants, animals, fish, or marine life?**

   Not applicable.

   Proposed measures to protect or conserve plants, animals, fish, or marine life are:

   Not applicable.

3. **How would the proposal be likely to deplete energy or natural resources?**

   Not applicable.

   Proposed measures to protect or conserve energy and natural resources are:

   Not applicable.

4. **How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?**

   Not applicable.

Proposed measures to protect such resources or to avoid or reduce impacts are:

Not applicable.

5. **How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?**

   Not applicable.

   Proposed measures to avoid or reduce shoreline and land use impacts are:

   Not applicable.

6. **How would the proposal be likely to increase demands on transportation or public services and utilities?**

   Not applicable.

   Proposed measures to reduce or respond to such demand(s) are:

   Not applicable.

7. **Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.**

   Not applicable.