DEPARTMENT OF ECOLOGY
State of Washington

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
REPORT OF EXAMINATION
To Appropriate Public Waters of the State of Washington

APPLICATION DATE	APPLICATION NO.
July 9, 2008	G2-30482

NAME

Clark Public Utilities

ADDRESS/STREET	CITY/STATE	ZIP CODE
PO Box 8900	Vancouver, WA	98668

PUBLIC WATERS TO BE APPROPRIATED

SOURCE

Wellfield

TRIBUTARY OF (IF SURFACE WATERS)

NA

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	10,000	11,200

QUANTITY, TYPE OF USE, PERIOD OF USE

11,200 acre-fee per year for municipal water supply, year round as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL

960 feet south and 1320 feet west from the northeast corner of the southwest quarter of Section 32, T. 5 N., R. 1 E.W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP	RANGE	WRIA	COUNTY
SW1/4	32	5 N.	1 E.W.M.	27	Clark

PARCEL NUMBER	LATITUDE	LONGITUDE	DATUM
258225000	45.871052 N	122.716749 W	WGS84

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED
[Attachment 1 shows location of the authorized place of use and point(s) of diversion or withdrawal.]

The place of use (POU) of this water right is the service area described in the most recent Water System Plan approved by the Washington State Department of Health, so long as the water system 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

The wellfield, consisting of four 20-inch wells, will be constructed on a 15.76-acre site on Parcel No. 258225000. A 24-inch transmission line or two 18-inch lines will convey untreated water from the wellfield approximately 8,000 feet southeast to the water filtration and treatment plant. The pipeline will probably follow easements under the East Fork Lewis River and easements east of the Interstate 5 freeway right-of-way to the treatment plant complex, which will be located northeast of the NW 319th Street/I-5 interchange. The treatment plant will be constructed on a portion of an 8.7-acre site on Parcel No. 210123000 located in the southeast 1/4 of Section 5, T4N, R1 EWM. An 18- to 24-inch water main will convey finished drinking water from the treatment plant complex approximately 5,000 feet southeast following NW 31st Avenue, Paradise Park Road, and La Center Road right-of-way to the utility's existing distribution system near NW 18th Avenue.

DEVELOPMENT SCHEDULE		
BEGIN PROJECT BY THIS DATE	COMPLETE PROJECT BY THIS DATE	WATER PUT TO FULL USE BY THIS DATE
Begun	2020	2030

PROVISIONS

Measurements, Monitoring, Metering and Reporting

An approved measuring device shall be installed and maintained for the source identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", WAC 173-173, which 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.

Ecology is requiring the recording and reporting of meter data as described above to collect seasonal information for water resource planning and compliance.

Water use shall be recorded weekly. Recorded water use data may be submitted via the Internet. To set up an Internet reporting account, contact the Southwest Regional Office. If you do not have Internet access, you can still submit hard copies by contacting the Southwest Regional Office for forms to submit your water use data.

Findings of Facts

Upon reviewing the investigator's report, I find all facts, relevant and material to the subject application, have been thoroughly investigated.

Therefore, I ORDER approval of Application No.G2-30482, subject to existing rights and the provisions specified above.

Signed at Olympia, Washington, this 20th day of September 2011.

Sincerely,

Michael J. Gallagher

Michael J. Gallagher
Water Resources Section Manager

Your Right To Appeal

You have a right to appeal this Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do the following within 30 days of the date of receipt of the Order.

File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.

- Serve a copy of your appeal and this Order on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.
- You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Street Addresses	Mailing Addresses
Pollution Control Hearings Board 1111 Israel RD SW Ste 301 Tumwater, WA 98501	**Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608

For additional information visit the Environmental Hearings Office Website: http://www.eho.wa.gov. To find laws and agency rules visit the Washington State Legislature Website: http://www1.leg.wa.gov/CodeReviser.

BACKGROUND

Project Description

Clark Public Utilities (CPU) filed water right application G2-30482 (priority date of July 9, 2008) for a permit to appropriate public groundwater from a proposed wellfield near the confluence of the East Fork and North Fork of the Lewis River (Paradise Point wellfield). The application requests 10,000 gpm of instantaneous supply and 11,200 ac-ft/yr of annual supply from up to four supply wells that would be completed in the Pleistocene Alluvial Aquifer. The water would be used on a year-round basis for municipal supply in the area served by CPU.

The proposed wellfield site is located on property owned by CPU at 34908 NW Toenjes Road, Woodland, Washington (Figure 1). The site is located in the SW1/4 of Section 32, Township 5 North, Range 1 East W.M. The 15.74 acre site lies in Clark County is located about three miles south of Woodland and about four miles north of Ridgefield, Washington. The site is located in area of an extensive, low-gradient floodplain formed by the erosional and depositional processes of the Lewis River and Columbia River drainage systems. The Lewis River discharges into the Columbia River about 3.2 miles west of the site. The site is surrounded by a dike which prevents flooding of the area. The site lies about 15 to 20 feet above mean seal level (msl).

The project will include construction of a wellfield supply source, water treatment facility, and transmission line that would interconnect the source to CPU existing facilities near Ridgefield. Future engineering studies will be used to assess the transmission line route and configuration as well as the location of treatment plant.

Table 1 Summary of Application No. G2-30482

Attributes	*Proposed*
Applicant	Clark Public Utilities (CPU)
Date of Application	July 9, 2008
Instantaneous Quantity	10,000 gallons per minute
Annual Quantity	11,200 acre feet per year
Source	Pleistocene Alluvial Aquifer
Point of Diversion/Withdrawal	Up to 4 supply wells
Purpose of Use	Municipal water supply
Period of Use	Year Round
Place of Use	Service area of Clark Public Utilities as well as service areas of City of Ridgefield and City of Battle Ground (via interties)

Legal Requirements for Application Processing

The following requirements must be met prior to processing a water right application:

- **Public Notice**
  Public notice of the application must be published in a local legal record of notice. There is a 30-day public comment period. A public notice of this application was published in The Columbian newspaper on June 30th and July 7th of 2011. No protests were received as a result of this notice.

- **State Environmental Policy Act (SEPA)**
  The subject water right application is subject to SEPA because the instantaneous quantity is greater than the 2,250 gallons per minute threshold. Clark Public Utilities as lead agency has reviewed the proposed project under the provisions of the State Environmental Policy Act (SEPA). It has determined that the proposal will probably not have a significant adverse impact on the environment and, therefore, an environmental impact statement is not required under RCW 43.21C.030(2)(c). This determination of non-significance (DNS) was issued under WAC 197.11.340(2) on July 12, 2010.

- **Water Resources Statutes and Case Law**
  Chapters 90.03 and 90.44 RCW authorize the appropriation of public water for beneficial use and describe the process for obtaining water rights. Laws governing the water right permitting process are contained in RCW 90.02.250 through 90.03.050. In accordance with RCW 90.02.290, determinations must be made on the following four criteria in order for an application for water rights to be approved:
  a) Water must be available;
  b) There must be no impairment of existing rights;
  c) The water use must be beneficial; and
  d) The water use must not be detrimental to the public interest.

INVESTIGATION

This investigation included, but was not limited to, research and/or review of the following:

- Records of water rights and well logs in the vicinity from Ecology.
- Notes from the site visit on February 28, 2011.
- Topographic maps including Ridgefield and Woodland United States Geological Survey (USGS) 7.5 minute topographic maps.
- Evarts, R.C, 2004a. Geologic Map of the Ridgefield Quadrangle, Clark and Cowlitz Counties, Washington. USGS Scientific Investigations Map 2844.
- Evarts, R.C. 2004b. Geologic Map of the Woodland Quadrangle, Clark and Cowlitz Counties, Washington. USGS Scientific Investigations Map 2827.
- Geographic Setting of the Place of Use and Point of Withdrawal.
- McFarland and Morgan, 1996. Description of the Ground-Water Flow System in the Portland Basin, Oregon and Washington. USGS Water Supply Paper 2470-A.
- Mundorff, M.J. 1964. Geology and Ground-Water Conditions of Clark County Washington, with a Description of a Major Alluvial Aquifer along the Columbia River. USGS Water-Supply Paper 1600.
- Pacific Groundwater Group, 2008. Lewis River Lowland Exploration and Testing Program. Prepared for Clark Public Utilities. February 13, 2008.
- Pacific Groundwater Group, 2009. Phase 1 Report - Clark Public Utilities Water Right Application G2-30482. Prepared for Phil Crane, Washington State Department of Ecology, December 18, 2009.
- Swanson and others, 1993. A Description of Hydrogeologic Units in the Portland Basin, Oregon and Washington. USGS Water Resources Investigation Report 90-4196.

HYDROLOGIC/HYDROGEOLOGIC EVALUATION

The regional geologic and hydrogeologic framework for Clark County was first developed by Mundorff (1964). Evarts (2004a and 2004b) mapped the Ridgefield and Woodland Quadrangles. Additional regional hydrogeologic investigation and interpretation was performed on the Portland Basin, including Clark County, by Swanson and others (1993), McFarland and Morgan (1996), and Everts (2004a, 2004b). Hydrostratigraphic cross sections of west-central Clark County were developed by Pacific Groundwater Group (2009).

The proposed wellfield lies along the northern edge of the Portland Basin. The basin encompasses the cities of Portland, Oregon, and Vancouver, Washington, and extends over an area of about 900 square miles. The basin is filled with approximately 1,400 feet of lacustrine and fluvial sedimentary deposits; these deposits are the primary source of groundwater in the region.

The hydrogeologic framework for the site was established by PGG (2009) based on earlier work by Mundoff (1964), Evarts (2004a and b) and the Portland Basin study project (Swanson 1993; McFarland and Morgan 1996). The site is located in the Lewis River floodplain (lowlands), which is incised into older Portland Basin deposits (uplands). The hydrogeologic units beneath the site, from youngest to oldest, are described below.

- **Recent Alluvium (RA).** Recent alluvium (RA) is generally encountered within the floodplains and low terraces along the floodplains of the rivers and creeks. The alluvium is relatively fine-grained in the tidally influenced areas and is more coarse-grained in the non-tidal reaches. The Recent alluvial deposits that blanket the lowland consist primarily of fine-grained silt and sand, which are typically 100 feet thick. These deposits contain two subunits. The upper subunit is about 50 to 75 feet thick and is composed of silt and silty fine sand with abundant organic matter. The lower subunit consist is about 25 to 50 feet thick and consists of cleaner fine sand with minor gravel. Both subunits appear to extend over most of the lowlands. The Recent alluvium deposits form the Recent Alluvial Aquifer (RAA), which is the uppermost aquifer within the Lewis River

lowland vicinity. The RAA is unconfined with water levels typically occurring within 10 to 20 feet of ground surface. The RAA is in direct hydraulic continuity with the Lewis River. Groundwater level fluctuations are highly correlated with changes in river stage. Because of its relatively low permeability, this aquifer is not an important water supply source. There appear to be a few wells in the lowland that use this aquifer for domestic and limited irrigation supply.

- **Pleistocene Alluvium (PA).** The Pleistocene alluvial (PA) deposits are a result of catastrophic flood events of the Columbia River during the last ice age (12,000 to 16,000 years ago). Sometimes referred to as the "Missoula" or "Bretz" flood deposits, these sediments are over 140 feet thick in the project area. They consist primarily of sand, gravel and cobbles with variable amounts of silt. The upper water bearing horizons generally cleaner and contain a smaller percentage of silt. Within the study area, these deposits mantle the upland plains and in the lowland, they occur beneath the recent alluvium. In the uplands, the deposits consist of fine-grained sand, silt, and clay, which is typically less than 100 feet in thickness. In the lowlands, the deposits are typically much coarser, consisting of sand, gravel and cobbles with varying amounts of silt. The Pleistocene Alluvium forms the Pleistocene Alluvial Aquifer (PAA). At the site, the PAA is about 120 to 150 feet thick. The most productive water bearing zones occur within the upper 70 feet where the deposits contain a lower percentage of silt. Testing at the Paradise Point wellfield site indicated that the PAA is confined and has relatively high transmissivity. Groundwater levels are highly correlated with changes in river stage suggesting that the aquifer is in hydraulic continuity with the Lewis River.

- **Troutdale Formation (TF).** The Troutdale Formation (TF) underlies the Pleistocene alluvium deposits and is composed of unlithified and semi-lithified sediments. In the study area, the Troutdale Formation is exposed along the steeper canyon walls of major drainage features, which have been eroded over time. The unit appears to be largely absent in the lowland vicinity where it has been eroded during periods of lower sea level.

- **Sandy River Mudstone (SRM).** The Sandy River Mudstone (SRM) deposits include all of the finer grained unconsolidated sediments beneath the Troutdale Formation. The deposits are exposed along the base of the steep canyon walls of the lower Lewis River drainage system. These deposits may be as much as 900 feet thick just southeast of the Ridgefield Junction (Swanson, et. al., 1993). The deposits are considerably thinner in the lowland vicinity where they have been partially removed by erosional processes of the Lewis River. The deposits correspond to Mundorff's lower member of the Troutdale Formation and Swanson's (1993) lower sedimentary system which includes Confining Unit 1, the Troutdale Sandstone Aquifer, Confining Unit 2, and the Sand and Gravel Aquifer. In the project vicinity, the deposits consist primarily of fine sand, silt, and clay. Coarse sand subunits encountered in surrounding areas serve as an important source of supply to wells in the Ridgefield area and many other areas of the county. The SRM deposits form a lateral boundary to the PAA deposits.

- **Older Rocks (Bedrock).** Within the study area, the Older Rocks (bedrock) crop out along the lower portions of the East Fork Lewis River between LaCenter and I-5 and within a localized area just north of the Ridgefield Wildlife Refuge. The older rocks include older Eocene to Oligocene age (about 40 to 24 million years old) partly metamorphosed andesitic to basaltic lava flows and somewhat younger Miocene (15 million years old) Columbia River basalts. These rocks usually yield only small amounts of water to domestic wells due to their low permeability. Bedrock serves as a no-flow hydraulic boundary to the PAA.

The Lewis River acts as a hydraulic boundary to the groundwater flow system west and south of the wellfield site. The North and East Forks exert strong influences on groundwater levels within both the RAA and PAA systems. Both rivers are tidally influenced through their connection with the Columbia River and the tidal and seasonal runoff variations cause variation in the stage of the Lewis River, which in turn cause variations in groundwater levels.

Recharge to the aquifer system comes from local precipitation, river connections, and deeper subflow from the upland areas south of the site.

SITE VISIT

On February 28, 2011 Roy Jensen of Hart Crowser met with Mr. Steve Prather of CPU and visited the well site and the surrounding area. During the site visit, he observed topography, surficial hydrologic conditions, well locations, and place of use, and discuss the project with the applicant representative.

WELL INFORMATION AND PUMPING TEST RESULTS

In 2007, two 8-inch test wells drilled at the site by CPU and pumping tests were performed by Pacific Groundwater Group. A 2-inch monitoring well was also installed at the site to assess surface water and groundwater interactions. Based on these tests, transmissivity of the PAA in this area ranges between about 230,000 and

416,000 gpd/ft and storage coefficient ranges between 0.0005 and 0.0007. Early drawdown data from the tests reflect the presence of a discharge boundary (interpreted as the influence of bedrock that occurs east of the site) while later drawdown data reflected the presence of a recharge boundary (interpreted as recharge from the Lewis River). Groundwater levels in the PAA at the site are highly correlated with changes in river stage, suggesting that the aquifer is in hydraulic continuity with the East and North Forks of the Lewis River, which are tidally influenced in this area by the Columbia River.

DRAWDOWN MODELING

The hydrogeologic impacts of pumping from the PAA aquifer is limited by the presence of bedrock deposits within the upland areas east of the wellfield site and by the hydraulic continuity of the river and groundwater. Therefore, Pacific Groundwater Group (2009) modeled the drawdown affect from pumping in the PAA at the proposed wellfield location.

The model is based on an assumed 10 million gallon per day supply option using the average aquifer properties that were derived from the pumping tests (transmissivity of 301,800 gpd/ft (40,200 ft2/d); storativity of 0.00059). The analysis included the affects of the no-flow boundary east of the site and the recharge boundaries that lie west and south of the site. The analysis revealed that total drawdown beyond a half mile of the wellfield should be less than 10 feet with little measurable drawdown expected to occur beyond a mile. Our additional analysis confirmed that drawdown depends on the amount of recharge from the Lewis River. If the amount of recharge from the Lewis River is less than expected then the amount of drawdown will be greater than predicted by Pacific Groundwater Group (2009).

EXISTING WATER RIGHTS AND WATER WELLS IN THE VICINITY OF THE PROPOSED PARADISE POINT WELLFIELD

Senior Water Rights

There are no senior permitted or certificated groundwater rights that lie within 1.5 miles of the wellfield site.

Permit Exempt Wells

A review of Ecology well log files indicate that there are over a 180 wells completed within a mile of the proposed wellfield site. Most of these wells are located in the upland areas that lie east and south of the wellfield and are assumed to be exempt withdrawals. The wells in the eastern upland (north of the East Fork Lewis River and east of I-5) are mostly completed in bedrock deposits, which are not know to have a significant connection with the PAA aquifer that occurs within the lowland. Most of the wells in the southern upland area are completed in sediments correlated to the Sandy River Mudstone and would have sufficient available drawdown to accommodate the expected level of interference drawdown projected by PGG from the proposed wellfield. There are only about eight wells in the lowland area within the immediate vicinity of the site. The closest wells are located along Toenjes Road, east of the site. The total predicted interference drawdown in this area at full build out of the wellfield would be less than 10 to 15 feet. Construction details indicate that most of the actively used wells in this area are completed at depths greater than 200 feet and have more than sufficient available drawdown to accommodate the expected level of interference. Therefore, it is projected that operation of the wellfield is not expected to adversely impact performance of existing wells in the vicinity of the proposed wellfield.

Watershed Planning

The proposed point of withdrawal lies in an area addressed by the Salmon-Washougal and Lewis Watershed Management Plan (Plan). The Plan was developed in accordance with RCW 90.82.130 by the Salmon-Washougal and Lewis Planning Unit and was approved in 2006. (The planning unit is a group made up of Clark, Skamania, and Cowlitz county commissioners and a broad range of water use interests. Ecology uses the plan as the framework for making water resource decisions in the Lewis watershed. Ecology relies upon the plan as a primary consideration in determining the public interest related to such decisions, including adoption of WAC 173-527.)

In accordance with the Plan, Ecology has closed much of the Lewis River basin to further appropriations (WAC 173-527-070). However, certain areas in the watershed—including the area in which the proposed withdrawal is located—are identified as regional supply areas. Ecology finds that withdrawals in these regional supply areas are unlikely to affect closed surface waters or protected instream flow values and that these areas are supported by the public interest as preferred locations for developing future water supply. Under WAC 173-527-070(2)(a), the proposed point of withdrawal for the subject application lies within an identified regional supply area, the area west of Interstate Highway 5, north of the East Fork Lewis River, and east of the Lewis River mainstem.

WATER AVAILABILITY

Tests wells located in the proposed Paradise Point wellfield were tested at 680 gpm for 24 and 6 hours with less than 10 feet of drawdown. Based on the highly transmissive nature of the PAA (in which the wells will be screened), we conclude that water is available for appropriation in the requested quantity.

IMPAIRMENT TO EXISTING WATER RIGHTS

The proposed use does not impact exempt wells, senior water rights, or surface water closures in the area.

BENEFICIAL USE

The proposed use is considered to be beneficial under RCW 90.54.020(1).

PUBLIC INTEREST CONSIDERATIONS

No detriment to the public interest was identified in evaluating this application.

CONCLUSIONS

In accordance with chapters 90.03 and 90.44 RCW, we find that there is water available for this beneficial appropriation from the source in question and that the appropriation as authorized will not impair existing rights or be detrimental to the public interest. Therefore, a permit should be issued, subject to the above-indicated provisions.

RECOMMENDATIONS

Based on the above investigation and conclusions, I recommend that the Application No. G2-30482 be authorized in the amounts and within the limitations listed below and subject to the provisions beginning on Page 2.

Purpose of Use and Authorized Quantities

The amount of water recommended is a maximum limit and the water user may only use that amount of water within the specified limit that is reasonable and beneficial.

- 10,000 gallons per minute (Qi);
- 11,200 acre-feet per year (Qa); and
- For municipal water supply.

Point of Withdrawal

Up to 4 proposed wells located in area 960 feet south and 1320 feet west from the northeast corner of the southwest quarter of Section 32, T. 5 N., R. 1 E.W.M.

Place of Use

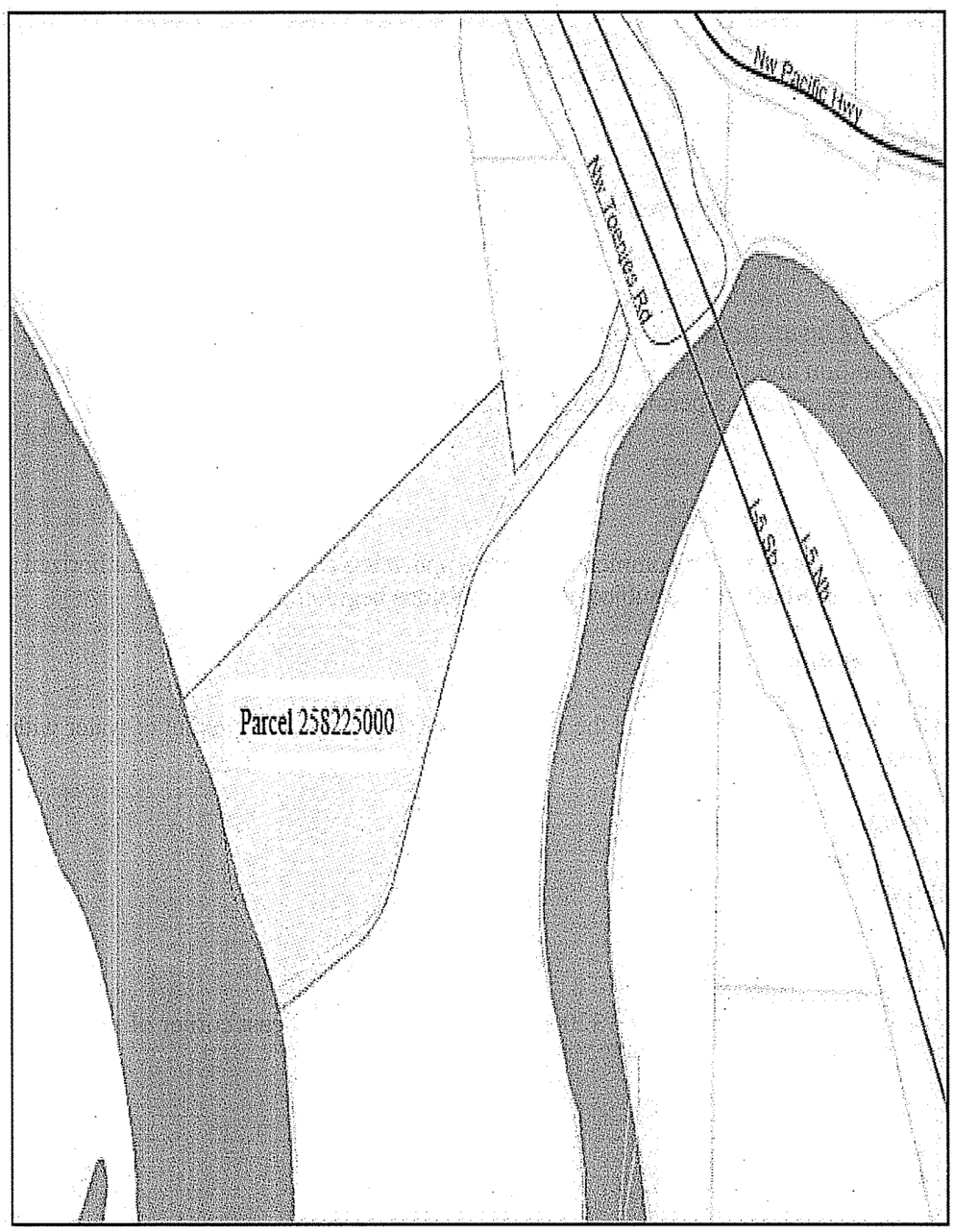
As described on Page 1 of this Report of Examination.

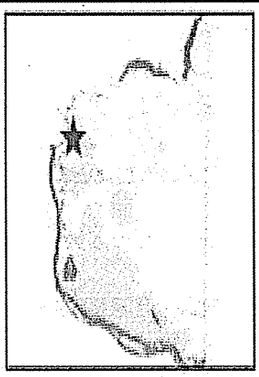
Reviewed by: Phil Crane
Phil Crane, Water Resources Program

9/20/2011
Date

If you need this publication in an alternate format, please call Water Resources Program at 360 407-6600. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

Paradise Point Parcel





Legend

- Parcels
- Roads
- Alley
- Arterial
- DNR
- DNR (Private Land)
- Driveway
- Interstate
- Interstate Ramp
- Primary Arterial
- Private Roads
- Private Roads w/o Names
- Public Roads
- SR Ramp
- State Route
- Waterbodies
- Rural Centers
- City Boundaries
- Urban Growth Boundaries
- County Boundary

Scale: 1:5,217

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Figure 1