WR File NR: CS4-300146CL
WR Doc ID: 4883534

DEPARTMENT OF ECOLOGY
State of Washington

State of Washington
REPORT OF EXAMINATION FOR WATER RIGHT CHANGE

Add Point of Withdrawal

PRIORITY DATE	CLAIM NUMBER	CHANGE APPLICATION NUMBER
1908	S4-300146CL	CS4-300146CL

MAILING ADDRESS
Adrienne Andersen
6446 Bortz Drive
Entiat, WA 98822

SITE ADDRESS (if different)

Total Quantity Authorized for Withdrawal or Diversion

WITHDRAWAL OR DIVERSION RATE	UNITS	ANNUAL QUANTITY (AF/YR)
180	gpm	24

Purpose

	WITHDRAWAL OR DIVERSION RATE			ANNUAL QUANTITY (AF/YR)		
PURPOSE	ADDITIVE	NON-ADDITIVE	UNITS	ADDITIVE	NON-ADDITIVE	PERIOD OF USE (mm/dd)
Irrigation of 5.1 acres	180		gpm	24		April 15–Sept 15

REMARKS
This water right change is to add a point of withdrawal.

IRRIGATED ACRES	
ADDITIVE	NON-ADDITIVE
5.1	

Source Location

COUNTY	WATERBODY	TRIBUTARY TO	WATER RESOURCE INVENTORY AREA
Chelan	Entiat River	Columbia River	Entiat WRIA 46

SOURCE FACILITY/DEVICE	PARCEL	WELL TAG	TWN	RNG	SEC	QQ Q	LATITUDE	LONGITUDE
Irrigation Well	252003340050	BCH050	25N	20E	03	SE SW	47.68673°	-120.31569°
Diversion/Pump	252003340050	--	25N	20E	03	SE SW	47.68702°	-120.31566°

Datum: WGS84

Place of Use (See Attached Map)

PARCELS (NOT LISTED FOR SERVICE AREAS)

252003340050

LEGAL DESCRIPTION OF AUTHORIZED PLACE OF USE

All that part of the southeast quarter of the southwest quarter and the southwest quarter of the southeast quarter of Section 3, Township 25 North, Range 20 East of the Willamette Meridian, Chelan County, Washington, lying and being west of the center of the Entiat River where the same now runs and south of the County Road where the same is now laid out, EXCEPT a tract of land described as follows: Beginning at the northwest corner of the southeast quarter of the southwest quarter of Section 3, Township 25 North, Range 20 E.W.M.; thence south 30 rods; thence east 24 rods; thence north 30 rods to the north line of said southeast quarter of the southwest quarter; thence west to the place of the beginning, AND ALSO EXCEPT the south 90 feet of the east 484 feet of the southeast quarter of the southwest quarter of said Section 3.

Proposed Works

The added Irrigation Well (Unique Well ID BCH050) was drilled in July 2011 with 8-inch-diameter casing to 68 feet. The existing irrigation system for the property consists of 3-inch-diameter underground pipes that convey water to the orchard rows, where water flows through above-ground sprinklers. Irrigation of the turf/pasture, lawn and garden areas is done manually.

Development Schedule

BEGIN PROJECT	COMPLETE PROJECT	PUT WATER TO FULL USE
Began	Completed	September 15, 2015

Measurement of Water Use

How often must water use be measured?	Monthly
How often must water use data be reported to Ecology?	Annually
What volume should be reported?	Total Annual Volume
What rate should be reported?	Annual Peak Rate of Withdrawal (gpm)

Provisions

Measurements, Monitoring, Metering and Reporting

An approved measuring device must 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", 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.

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

Non-Additive to Confirmed Claims
The tentative determination made by Ecology for this requested change is not an adjudication of the claim. Water use under this authorization will be considered non-additive to any water rights confirmed for this claim as a result of a general adjudication through Superior Court, should adjudication be undertaken.

Proof of Appropriation
The water right holder must file the notice of Proof of Appropriation of water (under which the Certificate of water right is issued) when the permanent distribution system has been constructed and the quantity of water required by the project has been put to full beneficial use. The Certificate will reflect the extent of the project perfected within the limitations of the superseding permit. Elements of a proof inspection may include, as appropriate, the source(s), system instantaneous capacity, beneficial use(s), annual quantity, place of use, and satisfaction of provisions.

Schedule and Inspections
Department of Ecology personnel, upon presentation of proper credentials, will have access at reasonable times, to the project location, and to inspect at reasonable times, records of water use, wells, diversions, measuring devices and associated distribution systems for compliance with water law.

Real Estate Excise Tax
This decision may indicate a Real Estate Excise Tax liability for the seller of water rights. The Department of Revenue has requested notification of potentially taxable water right related actions, and therefore will be given notice of this decision, including document copies. Please contact the state Department of Revenue to obtain specific requirements for your project.

Department of Revenue	Phone:	(360) 570-3265
Real Estate Excise Tax	Internet:	http://dor.wa.gov/
PO Box 47477	E-mail:	REETSP@DOR.WA.GOV
Olympia WA 98504-7477		

Findings of Facts
Upon reviewing the investigator's report, I find all facts, relevant and material to the subject application, have been thoroughly investigated. Furthermore, I concur with the investigator that water is available from the source in question; that there will be no impairment of existing rights; that the purpose(s) of use are beneficial; and that there will be no detriment to the public interest.

Therefore, I ORDER approval of Application No. CS4-300146CL subject to existing rights and the provisions specified above.

Your Right To Appeal

You have a right to appeal this Order to the Pollution Control Hearings 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.

Address and Location Information	
Street Addresses	**Mailing Addresses**
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503 **Pollution Control Hearings Board** 111 Israel Road SW STE 301 Tumwater, WA 98501	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 **Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

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://www.leg.wa.gov/CodeReviser

Signed at Yakima, Washington, this 24 day of APRIL 2014.

Mark Kemner, LHG, Section Manager
Water Resources Program/CRO

If you need this document in an alternate format, please call the Water Resources Program at 509-575-2490. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

INVESTIGATOR'S REPORT

BACKGROUND

On July 26, 2011, Adrienne Andersen submitted an Application for Change/Transfer of Water Right to the Washington State Department of Ecology (Ecology). The application was assigned Change Application No. CS4-300146CL. Andersen proposes to add a point of withdrawal (POW) located within the described place of use (POU) on parcel 252003340050 approximately 100 feet downstream of the existing point of diversion (POD). Attributes of the existing Claim and the Application for Change are presented below in Table 1. The proposed irrigation well has already been drilled and assigned the unique Ecology Well ID No. BCH050.

Table 1: Attributes of the Existing Water Right Claim and Proposed Change

Attributes	Existing	Proposed
Name	Timothy Holderness	Adrienne Andersen
Priority Date	1908	Same
Change Application Date	N/A	July 26, 2011
Instantaneous Quantity	0.4 cfs	180 gpm
Annual Quantity	24 acre-feet	24 acre-feet
Purpose of Use	Irrigation	Irrigation
Period of Use	April 15 to September 15	April 15 to September 15
Place of Use	SE¼ SW¼ of Sec. 03, T. 25 N./R. 20 E., Parcel 252003340050	Same
Point of Diversion	Entiat River SE¼ SW¼ of Sec. 03, T. 25 N., R. 20 E.W.M.	Entiat River (same), and Irrigation Well BCH050 in SE¼ SW¼ of Sec. 03, T. 25 N., R. 20 E.W.M.
Irrigated Acres	6	6

Stated in a letter from Trout Unlimited accompanying the Change Application, the POD change is part of a larger effort being conducted by the Cascadia Conservation District to decrease direct diversions from the Entiat River. The biological benefits to this are numerous and important to the long-term management goals for the Entiat River as laid out in the Entiat (WRIA 46) Watershed Plan. The intent is to fully use the groundwater source and only use the surface water source in case of emergency such as well failure.

Legal Requirements for Proposed Change

The following is a list of requirements that must be met prior to authorizing the proposed Change Application No. CS4-300146CL.

Public Notice

A public notice of the Change Application must be published in a local newspaper once a week for two consecutive weeks (RCW 90.03.280). The public notice of Change Application No. CS4-300146CL was published in the Wenatchee World during the weeks of December 27, 2012 and January 3, 2013.

State Environmental Policy Act (SEPA)
A water right application is subject to a SEPA threshold determination (i.e., an evaluation whether there are likely to be significant adverse environmental impacts) if any one of the following conditions are met.

- It is a surface water right application for more than 1 cubic-feet per second (cfs), unless that project is for agricultural irrigation, in which case the threshold is increased to 50-cfs, so long as that irrigation project will not receive public subsidies;
- It is a groundwater right application for more than 2,250 gallons per minute (gpm);
- It is an application that, in combination with other water right applications for the same project, exceeds the amounts above;
- It is a part of a larger proposal that is subject to SEPA for other reasons (e.g., the need to obtain other permits that are not exempt from SEPA);
- It is part of a series of exempt actions that, together, trigger the need to do a threshold determination, as defined under WAC 197-11-305.

Because this Change Application does not meet any of these conditions, it is categorically exempt from SEPA and a threshold determination is not required.

Water Resources Statutes and Case Law
Based on the provisions of RCW 43.21A.690 and RCW 90.03.265, this Change Application has been processed by Licensed Hydrogeologists with GeoEngineers, Inc. under Ecology Cost-Reimbursement Agreement No. GEO005 (master contract No. C1000187).

RCW 90.03.380(1) states that a water right that has been put to beneficial use may be changed. The point of diversion, place of use, and purpose of use may be changed if it would not result in harm or injury to other water rights.

The Washington Supreme Court has held that Ecology, when processing an Application for Change to a water right, is required to make a tentative determination of extent and validity of the Claim or Right. This is necessary to establish whether the Claim or Right is eligible for change. *R.D. Merrill v. PCHB* and *Okanogan Wilderness League v. Town of Twisp.*

The actual extent and validity of a water right claim can only be determined by a Superior Court in adjudication. Any tentative determination made on the extent and validity of a claim by Ecology as part of an Application for Change investigation is not an adjudication of the claim.

Administrative Status of Surface Water Bodies
Surface water bodies in the region are subject to administrative regulations governing the right to withdraw water for beneficial use. Minimum instream flow regulations for the Entiat watershed (Water Resource Inventory Area [WRIA] 46) have been adopted in WAC Chapter 173-546. Maximum future water right allocations in the Entiat River basin have been established for May 1 through July 15.

INVESTIGATION

The examination of the Application for Change of Surface Water Right Claim No. S4-300146CL submitted by Adrienne Andersen was led by consultants from GeoEngineers, Inc. contracted as part of Ecology's cost reimbursement program to facilitate the processing of the application. Kelsey Collins of the Water Resources Program, Ecology (Central Region), oversaw the examination and provided review.

The investigation included the review of:

- The State Water Code, specifically Title 173 Washington Administrative Code (WAC) and Title 90 Revised Code of Washington (RCW).
- United States Geological Survey (USGS) topographic maps.
- Washington State Department of Ecology, 2012, Washington State Well Log Viewer website, <http://apps.ecy.wa.gov/welllog/index.asp> (Accessed November 2012).
- Washington State Department of Ecology, 2012, Water Rights Tracking System (WRTS) website <http://www.ecy.wa.gov/programs/wr/rights/tracking-apps.html> (Accessed November 2012).
- Kirk, T., P. Kerr, and H. Riddle, 1995, Draft:
  Initial Watershed Assessment, Water Resources Inventory Area 46, Entiat River Watershed. Washington Department of Ecology Open File Report 95-02.
- Long, W. A., 1951, Glacial Geology of the Wenatchee-Entiat Area, Washington. Northwest Science 25, 3–16.
- Tabor, R. W., V. A. Frizzell, Jr., J. T. Whetten, R. B. Waitt, D. A. Swanson, G. R. Byerly, D. B. Booth, M. J. Hetherington, and R. E. Zartman, 1987, Geologic Map of the Chelan 30-Minute by 60-Minute Quadrangle, Washington. Map 1-1661. U.S. Geological Survey. Miscellaneous Investigations Series.
- Chelan County Conservation District (CCCD), October 2004, Entiat Water Resources Inventory Area (WRIA) 46 Management Plan.
- Walker, K., 2009, Technical Memorandum: Hydrogeologic technical analysis for Water Right Change Application Nos. CS4-069703CL@1, CS4-069703CL@2, CS4-069703CL@3, CS4-069703CL@4 and CS4-069703CL@5, Chelan County, Washington. Report by Kurt Walker and reviewed by Thomas Mackie.
- Schroeder, D. R., 1987, Analytical Stream Depletion Model:
  Ground Water Software Publication No. 1, Office of the State Engineer, Colorado Division of Water Resources.
- Google Earth aerial photographs from 1998, 2005, 2006, 2009 and 2011.
- Photocopies of aerial photographs of the Entiat River area from 1965, 1988 and 1994 were obtained from the Chelan County Assessor's office in Wenatchee.
- Photocopies of 1945 aerial photographs were provided by Ecology.
- Information submitted by and conversations and/or meetings with the applicant Adrienne Andersen, Jon Small, Kurt Hosman of Cascadia Conservation District and Jason Hatch of Trout Unlimited.
- A site visit on December 4, 2012.

History of Water Use

According to research conducted by CCCD (2004), the first orchard irrigation ditch in the Entiat River basin was built in 1887 By 1912-1913, about 40,000 fruit trees had been planted in this part of the valley. The Claim reports that the water was first put to use on the property in 1908.

The Andersen property is located in the Entiat River Valley, Water Resource Inventory Area (WRIA) 46. The single parcel (Parcel No. 252003340050) is 34 acres (ac) according to Chelan County Assessor data, comprised of a 4.3-ac pear orchard and a homestead with 0.8 ac of turf located at about river mile (RM) 6.1 (see Attachment 1). The Andersen property lies in the valley bottom bounded to the east by the Entiat River.

The Andersen pear orchard historically was irrigated using surface water from a diversion located approximately 80 feet southwest of the residence at 6446 Bortz Drive. On March 30, 1998, Timothy Holderness submitted to Ecology a Claim (No. S4-300146) that asserts a surface water right to 0.4 cfs, 3 acre foot per year (ac-ft/yr). Adrienne Andersen purchased the property in 2007. Ms. Andersen applied to correct the annual quantity, citing a ministerial error on the original claim by Timothy Holderness in which the 3 ac-ft/yr should be 30 ac-ft/yr. Ecology amended the claim to reflect this change on April 23, 2013.

The original claim lists 6 ac of irrigation from April 15 to September 15.. A review of aerial photos indicates that the irrigated area is approximately 5.1 ac.

Proposed Point of Withdrawal

The request is to add a new POW to the existing POD. The well has been drilled and a well log was obtained from Ecology's database. The proposed POW is an 8-inch-diameter irrigation well drilled in July 2011 to 68 ft and screened from 54 to 64.5 ft. The well was assigned Ecology unique well identification number BCH050, located approximately 170 ft north and 90 ft east of the south quarter of Section 3, T. 26 N., R. 20 E.W.M., approximately 65 ft west of the Entiat River. [Note that a typographic error on the Ecology Water Well Report has the well incorrectly located in Range 30 East.] A flow meter is installed at the well. The intent is to use the new POW as the main source and the existing POD is to be used only in the case of emergency, such as well pump failure.

Site Visit

A site visit was conducted by Joel Purdy, Senior Hydrogeologist with GeoEngineers, on December 4, 2012. Adrienne Andersen and Jon Small provided a tour of the POU, POW and irrigation system. The locations of the POW and POU were recorded using a GPS mapping system. Photographs were also taken of facilities.

The surface water is obtained from diversion off the Entiat River (the POD). The diversion includes a gate valve and fish screen. The groundwater is pumped from the well through two 4.8-gallon pressure tanks and 3-inch-diameter pipe to the existing irrigation water system of buried pipes.

Manually placed sprinklers and hoses are used for irrigating the turf/pasture, lawn and garden. Below-tree ¾-inch sprinklers are used on the main upper terrace and ¼-inch micro sprinklers are used on trees near the residence. A 3-inch totalizing flow meter was observed at the wellhead and it read 006216480 gallons. The irrigation well was not pumping at the time of the visit.

Extent and Validity

Aerial photographs from 1945 to 2011 were obtained from public sources. These aerial photographs were reviewed to assess the irrigated areas after 1967 per RCW 90.14.160. Based on the aerial photographs and the site visit, there are three main areas of irrigation on the Andersen parcel:

1) a main block of orchard on the terrace to the west of the residence;
2) fruit trees on the lower terrace near the driveway; and
3) the pasture/lawn, landscaping and miscellaneous trees surrounding and north of the residence. Areas 1 and 2 total approximately 4.3 ac and are irrigated using under-tree ¾-inch and ¼-inch sprinklers. Area 3, approximately 0.80 ac, is irrigated with hand-placed lawn sprinklers and impact sprinklers. There appears to be a total of 5.1 ac of irrigation.

It appears that all three areas have been irrigated consistantly for the period of available aerial photography. There was no definitive evidence found to indicate that the irrigation was discontinued for any five-year period.

Adrienne Andersen submitted a claim amendment request stating that annual usage should be 30 ac-ft/yr for the irrigation of 6 ac instead of 3 ac-ft/yr. On April 23, 2012 Ecology recognized the claim amendment request and admisistraively changed the annual quantity for the claim.

Ms. Andersen's application requested to withdraw 24 ac-ft/yr from a new well. According to the Entiat Rule WAC 173-546 and the Washington Irrigation Guide (WIG), 24 ac-ft for 5.1 ac is reasonable. The WIG allows 4.78 ac-ft/ac for irrigation of tree fruit (@ 65%efficiency) and 4.06 ac-ft/acre for irrigation of turf (@ 65% efficiency):

4.3 ac of tree fruits × 4.78 ac-ft/ac-yr = 20.6 ac-ft/yr
0.8 ac of turf × 4.06 ac-ft/ac-yr= 3.2 ac-ft/yr
20.6 ac-ft/yr (trees) + 3.2ac-ft/yr (turf) = 23.8 ac-ft/yr

Other Water Rights Appurtenant to the Proposed Place of Use

Information on water rights in the Entiat River valley was obtained from Ecology's Water Resources Explorer online database. There appear to be no other applications, water rights or claims for the subject POU. There are four surface water rights and five groundwater rights downstream of the Andersen POW within the Entiat River Valley. There are also 47 groundwater claims and 23 surface water claims downstream of the Andersen property.

Hydrologic/Hydrogeologic Evaluation

The following is a discussion of the hydrogeologic and hydrologic characteristics in the vicinity of the Change Application.

Well Location and Description

The irrigation well is located about 65 ft from the left bank of the Entiat River and about 200 ft from a potential domestic well (not observed) associated with the adjacent residence to the southwest. The well was drilled in July 2011 with 8-inch-diameter casing to 68 ft and is screened from a depth of 54 to 64.5 ft. The groundwater level in the Andersen irrigation well was reported on the log at a depth of 7 ft below the top of the well casing.

Hydrologic Setting

The Entiat River originates from the eastside of the Cascade Mountains, flows southeast through the valley between the Chelan and Entiat Mountains, and joins the Columbia River about 9.5 river miles downstream near Entiat, WA. A large portion of the annual precipitation in the basin falls as snow and forms the winter snowpack. Spring temperatures and rain release water accumulated in the snowpack. The snowpack runoff is the dominant source of streamflow and groundwater recharge in the basin. For the USGS stream gage (#12453000) at Entiat (R.M. 0.5) from 1911 through 1925 and 1951 through 1958, the mean annual flow ranged from 275 to 800 cfs, peak annual flow ranged from 1,100 to 10,800 cfs and the 7-day mean low-flow ranged from 45 to 120 cfs (CCCD, 2004). The Entiat River gage was moved to near Keystone (#12452990 at R.M. 1.4) in 1996. Runoff is highly variable within the watershed. Data from the USGS gage near Ardenvoir (#12452800) show that in the water year 1972 the annual streamflow was 451,140 af. The next year the flow was 178,970 af (Kirk et al., 1995)

Geologic Setting

The deeply incised Entiat River Valley is underlain by metamorphic and plutonic bedrock that is overlain by volcanic ash, regolith, and unconsolidated glacial and alluvial sediments. The bedrock was formed before the Tertiary period and consists mainly of gneiss, amphibolite, tonalite, gabbro, schist, marble and quartzite. The hillslopes at both sides of the river are mainly composed of tonalite and tonalite gneiss of the late Cretaceous Entiat Pluton (Tabor et al., 1987).

The unconsolidated sediments within the Entiat River valley include glacial tills and outwash originating from the Peshastin and Leavenworth Stage glaciers during the last Ice Age (Long, 1951) and younger surficial alluvium. The sediments mainly contain moderately sorted cobbles, sand and gravel (Long, 1951; Tabor et al., 1987). Below Ardenvoir, where the subject area is located, the valley is generally unglaciated and the unconsolidated deposits are generally reworked glacial material and alluvium consisting of moderately sorted cobbles, sand and gravel that overlie the bedrock. The thickness of the unconsolidated deposits is typically between 50 and 100 feet within the unglaciated portion of the Entiat River valley (Kirk et al., 1995).

Hydrogeologic Analysis

The Entiat River valley forms a laterally bounded system with groundwater in the alluvial flood plain in direct hydraulic continuity with the Entiat River. The aquifer tapped by the Andersen irrigation well is comprised of approximately 50- to 60-ft-thick deposits of unconsolidated alluvium. Water that is pumped from the Andersen irrigation well is derived in part from the river, and causes drawdown in the aquifer that intercepts a portion of (or reduces) groundwater discharge from the aquifer as baseflow to the river. Consequently, the net effect on river flow of changing to a groundwater source is generally less than if all the water came directly from the river, as is the case with the existing surface water diversion.

Estimates for transmissivity of the unconsolidated deposits in the upper Entiat River valley range from 12,000 to 60,000 gallons per day per foot (gpd/ft) based on analysis of pumping test data (Kirk et al., 1995). Four wells drilled for Gollaher located on the other side of the Entiat River were pumped at rates from 200 to 250 gpm, with drawdown ranging from 15 to 33 ft. The pumping test data also suggest a high transmissivity at the Andersen location as seen in the upper valley.

Impairment

The only pumping test data available for the Andersen irrigation well is as provided on the Ecology well log. The test data reported on the well log indicates that the well was air-lifted at 60 gpm for 1 hour.

However, aquifer transmissivities are assumed to be high based on pumping tests conducted elsewhere in the valley. An analysis of potential impairment was conducted assuming an aquifer transmissivity of between 12,000 and 60,000 gpd/ft. The interference drawdown at a distance of 200 feet is expected to be between 1 and 4 feet based on image well theory taking into account the positive boundary of the river and the negative boundary of the valley walls. Thus, the use of the Andersen irrigation well at a rate of 180 gpm will not impair other groundwater or surface water users in the vicinity based on available information.

Same Source Consideration

To change from a point of diversion to a point of withdrawal, the well must be in direct hydraulic continuity with the original surface water source. Direct hydraulic continuity exists when, as a result of pumping the proposed well, additional water from the original surface water source will flow into and recharge the aquifer where it can eventually be captured as ground water. Additionally, the proposed well must be located and constructed such that within a short time after pumping starts, the majority of the pumped water should be derived from, or replaced by, the surface water source; and within a short time after pumping stops, the ground water that has been removed from aquifer storage should be replaced by infiltration from the surface water source. This requirement ensures that the POW can be managed in the same manner as the POD. An analytical groundwater flow model that included representation of the river was used to evaluate the hydraulic relationship between the original source of water and the proposed well.

The Integrated Decision Support Alluvial Water Accounting System (IDS AWAS) was used to compute the amount and timing of pumping-induced stream flow depletion from operation of the proposed well based on the Analytical Stream Depletion Model (ASDM) (Schroeder, 1987). The rate and timing of stream depletion are dependent on the properties of the subject aquifer and the distance between the pumping well and the stream. In general, the greater the distance between the pumping well and the stream, the greater the time period is between pumping and stream flow impact. The aquifer characteristics and well properties described above were used to define the ASDM parameters. An average pumping rate of 180 gpm and a transmissivity of 30,000 gpd/ft were used to predict the rate and timing of stream depletion of the Entiat River. The model predicts that after one day of continuous pumping, stream depletion accounts for approximately 87% of the water drawn from the proposed well. Similarly, when the pumping ceases, stream depletion is expected to decrease by more than 87% within one day. As a result, the proposed well is considered to be in direct hydraulic continuity with the Entiat River, and the proposed well can be effectively managed in the same manner as the historic POD.

Availability

Precipitation and snowmelt within the drainage basin provide water to maintain streamflow and groundwater levels. The Andersen irrigation well (BCH050) was successfully air-tested after construction at over 60 gpm for 1 hour. Based on its location and shallow depth, the inferred source aquifer is considered to be in hydraulic continuity with the adjacent Entiat River. It is unknown what the capacity of the installed pump is. Since the capacity to pump the claimed 180 gpm from the well has not been demonstrated, it is unknown if water is physically available to meet the claimed withdrawal of 180 gpm (0.4 cfs) and 24 ac-ft/yr. However, based on nearby wells, high aquifer transmissivities and thickness of the aquifer, it is likely that 180 gpm can be obtained at the site from a well (or wells). Note that the manufacturer's suggested capacity for the well screen is approximately 245 gpm.

There are no closures on surface water bodies in WRIA 46. Therefore, surface water and groundwater is legally available for appropriation. The water use authorized under this change will be considered non-additive to any water rights confirmed for said Claim as a result of a general adjudication through Superior Court, should adjudication be undertaken.

Impairment

The requested change is for use from a well that is located approximately 200 ft from the nearest neighboring well and will not impair existing users. The change from a direct surface water diversion to a groundwater withdrawal will buffer the impacts to the Entiat River and the Claim will not be increased and therefore will not impair existing water rights.

Public Interest

RCW 90.03.290 requires that a proposed appropriation not be detrimental to the public interest. The seasonal withdrawal from April 15 through September 15 for irrigation is consistent with state policy without adversely impacting instream flows or other public needs and values. No detriment to public interest could be identified during the examination of the subject application.

In general, removing PODs and instream structures from a river has a positive impact on aquatic habitat. Diversions and instream pumps require frequent servicing that involves entering the river to repair structures, remove silt and debris from screens, and maintaining pushup dams. Replacing a POD with a POW alleviates the need for repeated construction in the river and the associated disturbances from increased silt loading and streambank modifications.

Consideration of Protests and Comments

No protests or comments have been filed.

CONCLUSIONS

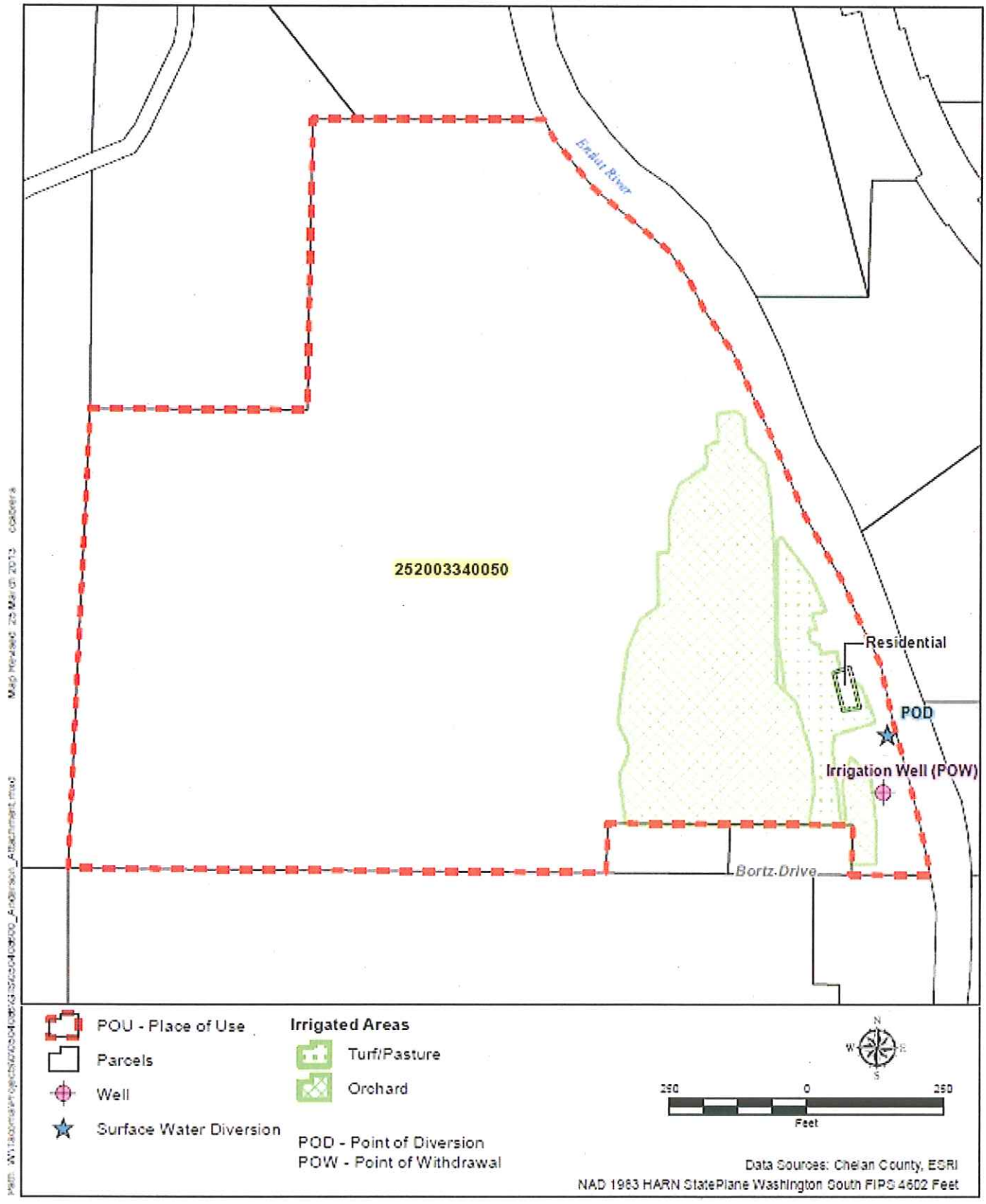
The request to add a point of withdrawl will not impair existing water users.

RECOMMENDATIONS

Based on the information presented above, the author recommends that:

> Change Application No. CS4-300146CL be approved in the amounts, and subject to the provisions described in the Order for Report of Examination No. CS4-300146CL, pages 2-3.

Report by: Joel W. Purdy _____ _____

Joel W. Purdy, LG, LHG Date

ATTACHMENT: Place of Use, Existing Point of Diversion, Proposed Point of Withdrawal and Irrigated Areas for the Andersen Change Application CS4-300146CL.