STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION
Change of: Point of Diversion
WRTS File No. CS4-WRC158608@1

PRIORITY DATE	CLAIM NO.	PERMIT NO.	CERTIFICATE NO.
1910	WRC158608		

NAME

Bruce and Sandra Wick

ADDRESS/STREET	CITY/STATE	ZIP CODE
5696 Entiat River Road	Entiat, Washington	98822

PUBLIC WATERS TO BE APPROPRIATED

SOURCE

A Well

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND (cfs)	MAXIMUM GALLONS PER MINUTE (gpm)	MAXIMUM ACRE FEET PER YEAR (ac-ft/yr)
	175	12.2

QUANTITY, TYPE OF USE, PERIOD OF USE

175 gpm, 12.2 ac-ft/yr, from April 1 through September 30 for the irrigation of 3 acres.

Use under Water Right Claim No. 158608 (A) and (B), and Water Right Claim No. 153189 (A) and (B) are limited to a combined maximum instantaneous rate of withdrawal of 175 gallons per minute and a combined maximum annual quantity of 28 acre-feet per year for the irrigation of 6.9 acres.

Use under Water Right Claim No. 158608(A) and Water Right Claim No. 153189(A) are limited to a maximum annual quantity of 14.2 ac-ft/yr, for the irrigation of 3.5 acres from April 1 through September 30.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

600 feet east and 150 feet north of the southwest corner of Section 11.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP	RANGE	WRIA	COUNTY
SW¼SW¼	11	25 N.	20 E.W.M.	46	Chelan

PARCEL NUMBER	LATITUDE	LONGITUDE	DATUM
2520113300250	47.6717°	-120.3031°	WGS84

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

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

Lot 1 of Gibson Short Plat, Subdivision No. 1171, Chelan County, located in Section 11, T. 25 N., R. 20 E.W.M. Parcel No. 252011330150.

DESCRIPTION OF PROPOSED WORKS

The well (AEG337) is an 8" diameter drilled well completed to a depth of 75 feet. The well is equipped with a 7.5 horsepower submersible pump and a Siemens MAG8000 flow meter.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE	COMPLETE PROJECT BY THIS DATE	WATER PUT TO FULL USE BY THIS DATE
Begun	Completed	In Use

PROVISIONS

1. **Limitations of Use**
   1.1. Use under Water Right Claim No. 158608 (A) and (B), and Water Right Claim No. 153189 (A) and (B) are limited to a combined maximum instantaneous rate of withdrawal of 175 gallons per minute and a combined maximum annual quantity of 28 acre-feet per year for the irrigation of 6.9 acres.

   1.2. Use under Water Right Claim No. 158608(A) and Water Right Claim No. 153189(A) are limited to a maximum annual quantity of 14.2ac-ft/yr, for the irrigation of 3.5 acres from April 1 through September 30.

2. **Measurements, Monitoring, Metering and Reporting**
   2.1. 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

   2.2. Water use data shall be recorded weekly. The maximum rate of diversion/withdrawal and the annual total volume shall be submitted to the Department of Ecology by January 31st of each calendar year.

   2.3. 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.

   2.4. Chapter 173-173 WAC 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 entitled "Water Measurement Device Installation and Operation Requirements". http://www.ecy.wa.gov/programs/wr/measuring/measuringhome.html

   2.5. Ecology prefers water use data submitted via e-mail in the form on an electronic spreadsheet. However, hard copies are still accepted. In the future, recorded water use data may be submitted via the Internet. Contact the Central Regional Office for forms or information on available options for submittals.

3. **Water Use Efficiency**
   Use of water under this authorization shall be contingent upon the water right holder's maintenance of efficient water delivery systems and use of up-to-date water conservation practices consistent with established regulation requirements and facility capabilities.

4. **Non-Additive to Confirmed Claims**
   The water use authorized under this filing shall 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.

5. **Schedule and Inspections**
   Department of Ecology personnel, upon presentation of proper credentials, shall 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.

6. **Easement Right-of-Way**
   The water source and/or water transmission facilities are not wholly located upon land owned by the applicant. Issuance of a water right determination by Ecology does not convey a right of access to, or other right to use, land which the applicant does not legally possess. Obtaining such a right is a private matter between applicant and owner of that land.

FINDINGS OF FACT AND ORDER

Upon reviewing the investigator's report, I find all facts relevant and material to the subject application have been thoroughly investigated. Furthermore, I find the change of water right as recommended will not be detrimental to existing rights or the public welfare.

Therefore, I ORDER approval of the recommended change to a point of withdrawal proposed under Change Application No. CS4-WRC158608CL@1, subject to existing rights and the provisions listed above.

You have a right to appeal this decision. To appeal this you must:

- File your appeal with the Pollution Control Hearing Board within 30 days of the "date of receipt" of this document. Filing means actual receipt by the Board during regular office hours.
- Serve your appeal on the Department of Ecology within 30 days of the "date of receipt" of this document. Service may be accomplished by any of the procedures identified in WAC 371-08-305(10). "Date of receipt" is defined at RCW 43.21B.001(2).

Be sure to do the following:

- Include a copy of this document that you are appealing with your Notice of Appeal.
- Serve and file your appeal in paper form; electronic copies are not accepted.

1. To file your appeal with the Pollution Control Hearings Board:

Mail appeal to:	OR	Deliver your appeal in person to:
The Pollution Control Hearings Board PO Box 40903 Olympia WA 98504-0903		The Pollution Control Hearings Board 4224 – 6th Ave SE Rowe Six, Bldg 2 Lacey WA 98503

2. To serve your appeal on the Department of Ecology:

Mail appeal to:	OR	Deliver your appeal in person to:
The Department of Ecology Appeals & Application for Relief Coordinator PO Box 47608 Olympia WA 98504-7608		The Department of Ecology Appeals & Application for Relief Coordinator 300 Desmond Dr SE Lacey WA 98503

3. And send a copy of your appeal packet to:

Mark C. Schuppe, Section Manager
Water Resources Program, Dept. of Ecology
Central Region Office
15 W Yakima Ave Ste 200
Yakima WA 98902-3452

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 14 Th day of January 2010.

Mark C. Schuppe

Mark Schuppe, Section Manager
Water Resources Program
Central Region Office

BACKGROUND

Description and Purpose of Proposed Change

On November 16, 2006, Bruce and Sandra Wick (the Wicks) and Ed and Pat Tippen (the Tippens) all of Entiat, Washington, filed two *Applications for Change* with the Department of Ecology (Ecology) requesting authorization to change the point of diversion for Water Right Claim No. 158608 from the Entiat River to a nearby well. Each party owns a portion of the place of use and the applicants filed separate applications to reflect their desire for the issuance of separate water right documents. The Tippens and the Wicks are the only landowners who irrigate under this claim. The applications were accepted and assigned change application control numbers CS4-WRC158608@1 (the Wicks) and CS4-WRC158608@2 (the Tippens). A second claim, Water Right Claim No. 153189, is also appurtenant to the same place of use (POU) and two Applications for Change were filed by the Wicks and the Tippens as well; these *Applications for Change* are discussed in a separate Report of Examination (ROE).

Furthermore, the four *Applications for Change* (CS4-WRC158608@1, CS4-WRC158608@2, CS4-WRC153189@1, and CS4-WRC153189@2) were filed in conjunction with two change applications from adjoining property owner Russell Griffith (CS4-WRC144674 and CS4-WRC144676). All three parties used the same surface water diversion point on the Entiat River and have proposed to shift to two wells located approximately 100 feet from each other on property owned by the Tippens. Mr. Griffith plans to use one of the wells, and the second will be shared by the Tippens and the Wicks. The Tippens and Wicks intend to use the proposed POW to withdraw water claimed under Water Right Claim Nos. 158608 (the subject of this report) and 153189. This project site is located approximately 4 miles upstream from the confluence of the Entiat River with the Columbia River in WRIA 46.

The applicants state that the original diversion consisted of a push-up dam that diverted water into an off-channel pond. Water was then pumped into a pressurized system for irrigation. The applicants' lands are presently being irrigated for pasture, and this use is projected to continue in the future.

The project is located in the Entiat River valley and will benefit Upper Columbia steelhead, spring Chinook salmon and bull trout. Discontinuing the direct surface water diversion will prevent Endangered Species Act listed juvenile salmon and other fish from death by being sucked into the irrigation system and eliminate water quality impacts associated with the annual maintenance of the instream pushup dam. This project is consistent with the goals of the Entiat WRIA 46 Watershed Management Plan approved in 2004 as well as the draft Upper Columbia Salmon Recovery Plan. This project is being funded by the Bureau of Reclamation and the Cascadia (formerly Chelan) Conservation District.

Based on the provisions of RCW 43.21A.690 and RCW 90.03.265, Pacific Groundwater Group (PGG) prepared a first draft this report under contract to Ecology. PGG reviewed all available documents pertaining to this and other related *Applications for Change*, including site conditions, hydrogeological considerations, historical water use, and standing of existing rights. Taylor C. Horne of Ecology significantly modified and enhanced the report to produce the final version of this Report of Examination for Change of Water Right.

This ROE will address the changes proposed in Change Application No. CS4-WRC158608@1. If approved, a discrete superseding document (i.e. Certificates of Change) should be issued to the Wicks.

As stated in the change applications, the purposes of the proposed changes is to change the point of diversion from the Entiat River to a well constructed adjacent to the river, and to split the claim amongst the two landowners.

Attributes of the Claim and Proposed Change

Table 1 Summary of Proposed Changes to Water Right Claim 158608

Attributes	*Existing*	*Proposed*
Name	John A. Bortz	Bruce & Sandra Wick
Priority Date | Date of Application for Change	"12-10" 1910	November 22, 2006
Instantaneous Quantity	1.0 cfs	175 gpm
Annual Quantity	24 ac-ft/yr	No change
Source	Entiat River	Well
Point of Diversion/Withdrawal	SW¼SW¼SW¼ of Section 11, T. 25 N., R. 20 E.W.M.	Section 11, T. 25 N., R. 20 E.W.M.
Purpose of Use	Irrigation of 6 acres	No change
Period of Use	April 1 to October 1	No change
Place of Use	Part of the southwest quarter of southwest quarter of Section 11, Township 25 North, Range 20 E.W.M, Chelan County, Washington, described specifically in claim document.	Lot 1 of Gibson Short Plat, Subdivision No. 1171, Chelan County

Legal Requirements for Proposed Change

The following is a list of requirements that must be met prior to authorizing the proposed changes in the *Application for Change.*

- **Public Notice**
  A public notice of the proposed changes was published in the Wenatchee World on October 2 and 9, 2008. No protests or comments were submitted during the thirty-day protest period.

- **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 foot per second, unless that project is for agricultural irrigation, in which case the threshold is increased to 50 cubic feet per second, 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;
  - It is an application that, in combination with other water right applications for the same project, collectively 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 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

- The validity of a claim can only be determined by a Superior Court in an adjudication. Any tentative determination made on a claim by Ecology as part of an application for change investigation is not an adjudication of the claim. *Rettkowski v. Department of Ecology, 219 122 Wn.2d 219, 858 P.2d 232 (1993).*

- 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 the extent and validity of the claim or right. This is necessary to establish the extent to which the claim or right is eligible for change. *R.D. Merrill v. PCHB* and *Okanogan Wilderness League v. Town of Twisp.*

- A point of diversion for a surface water right may be changed to a ground water point of withdrawal. The authority is derived from RCW 90.03.380, RCW 90.44.020-030, RCW 90.44.100 and RCW 90.54.020(9). RCW 90.03.380(1) states that a water right that has been put to beneficial use may be changed if it would not result in detriment or injury to other water rights. Additionally, moving the point of diversion to a groundwater withdrawal requires compliance with the groundwater code (RCW 90.44), including a finding that there be no detriment to the public welfare and that the source of the existing diversion and the proposed point of withdrawal be part of the same water body.

INVESTIGATION

Information for this investigation was obtained during a site visit conducted on October 22, 2008, by Jill Van Hulle and Doug Kelly of Pacific Groundwater Group and Ecology representative Taylor C. Horne. Applicants, Ed Tippen and Bruce Wick, were present during the site investigations and provided information regarding the historical and current use of water on their sites. Additional information was obtained from:

- applicable RCW and WAC chapters,
- Ecology records,
- historical aerial photographs and maps,
- Geographic Information System (GIS) data,
- Chelan County records, and
- documents listed in the *References* section of this report.

History of Water Use

The property subject to the *Applications for Change* is located in the Entiat River valley approximately four river miles upstream of the Entiat River's confluence with the Columbia River, Water Resource Inventory Area (WRIA) 46.

The property once supported orchards; currently, both applicants irrigate pasture. The Wicks raise and maintain horses, mules, and donkeys; these the animals graze the pastured area. Water is applied via a hand-line irrigation system with impact sprinkler heads. The Tippens grow pasture grass and irrigate with a hand-line irrigation system with impact sprinkler heads.

Water Right Claim No. 158608 was filed by John A. Bortz, asserting a right to 1.0 cubic feet per second (cfs), 24 acre-feet per year (ac-ft/yr), for the irrigation of 6 acres from April 1 to October 1 from a point of diversion on the Entiat River located 130 feet north and 590 feet east from the southwest corner of Section 11, in the SW¼SW¼SW¼ of Section 11, T. 25, R. 20 E.W.M. The claimed date of first use is listed as "12-10" in 1910. The claim was not signed or dated. Ecology received the claim on June 5, 1974.

The claimed place of use (POU) under Water Right Claim No. 158608 corresponds to the Tippens' parcel (Assessor No. 252011330250), the Wicks' parcel (Assessor No. 252011330150), a parcel to the north of the Wicks owned by Russell Griffith (Assessor No. 252011330100), and portions of another parcel owned by Russell Griffith (Assessor No. 252011330050). Until 2006, Russell Griffith shared a POD with the Tippens and Wick, but irrigated his parcels with two different claims (Water Right Claim Nos. 144674 and 144676). Mr. Griffith's claims are the subject of discrete ROEs.

Historic aerial photographs indicate that irrigation under Water Right Claim No. 158608 has occurred on both the Tippens' and Wicks' parcels. Water diverted under Water Right Claim No. 158608 was comingled with water diverted under Water Right Claim No. 153189 as both claims assert the same POU (refer to *Other Rights Appurtenant to the Place of Use* section). A 1945 aerial photograph indicates that both the Tippens' and Wicks' property was planted with orchard. A 1998 aerial photograph indicates the Wick's property was in orchard, while the Tippen's property was not planted with orchard and sparsely irrigated. A 2005 aerial photograph indicates pasture irrigation on the Wicks' property and sparse pasture irrigation on the Tippens' property. 2006 aerial photography indicates pasture irrigation on both parcels. The site visit was conducted after the end of irrigation season; however, lush grass was evident on both parcels, indicating irrigation had occurred during the preceding irrigation season.

Historic Points of Diversion and Withdrawal

As mentioned above, Water Right Claim No. 153189 is the second claim that is asserted for the same POU as Water Right Claim No. 158608. A map filed with Water Right Claim No. 153189 indicates the location of point of diversion from the Entiat River in the SW¼NE¼ of Section 10, T. 25 N., R. 20 E.W.M. On the map, a note states "previous P.O.D. filed Dec 3, 1910". This may have been the location of a ditch that delivered water to the POU prior to the advent of electric pumps and the 1974 claims registry. According to the applicants, water diverted under the two claims was delivered to the POU via a gravity-fed ditch and that ditch was removed prior to the 1974 claims registry. This ditch POD location is approximately 0.75 miles upstream from the claimed PODs for Water Right Claim Nos. 158608 and 153189.

In Water Right Claim No. 158608, the claimed point of diversion was located in the SW¼ of the SW¼ of Section 11, Township 25 N., Range 20 E.W.M. The applicants indicated that the POD consisted of a 5 horsepower (hp) centrifugal pump which pumped water diverted into a pool off the Entiat River into a 2000 gallon tank, from which a 25 hp pump distributed water to the fields. This claimed point of diversion has not been used since 2007 and is now decommissioned.

Proposed Point of Withdrawal

The water quantities asserted by Water Right Claim Nos. 158608 and 153189 are proposed to be withdrawn from the proposed point of withdrawal (POW).

The well (Ecology well tag ID AEG337) is shared by the Tippens and the Wicks. Construction of the well was completed in August 2006. The well was in use for the 2007 and 2008 irrigation season. A pumping test suggests that the Tippen/Wick well is capable of producing 175 gpm.

The well is situated in the SW¼ of the SW¼ of Section 11, Township 25 N., Range 20 E.W.M., less than 50 feet from the Entiat River on pastured property owned by the Tippens. The Tippen/Wick well was constructed with a 6 inch casing and is equipped with a 10-hp submersible pump capable of producing 175 gpm. The well is shared between the two property owners, who report that they generally have enough water to keep their properties irrigated.

Place of Use

As previously mentioned, Water Right Claim No. 158608 is appurtenant to both the Tippens' and the Wicks' property, and the well is shared between the two applicants. Since not all the land covered by these rights can be irrigated at the same time the applicants coordinate their irrigation timing and are generally able to share the well without issue. At the time of the visit in mid-October the site appeared green. The claimed irrigation season ends October 1.

Wick Site

The Wicks irrigate 3.5 acres within the POU (Parcel No. 252011330150). Mr. Wick acquired the property in 1985, at which time most of the property was in orchard production. The present use of the property is for hay/alfalfa production, pasture, and a few fruit trees. Mr. Wick operates an outfitting business and the land is heavily grazed by horses, mules and donkeys.

The Wicks' irrigation system uses 83 sprinklers on hand-lines and risers to irrigate the 3.4 acres, operated on 12-hours sets in coordination with the Tippens.

Tippen

The Tippens' site was originally acquired by the Tippen family in 1910. The property was in orchard production up until the mid-1960s when the trees were removed.

The Tippens irrigate 3.4 acres of grassy pastured areas and plantings within the POU (Parcel No. 252011330250). The irrigation system includes 28 sprinklers on hand-lines, and the applicant generally applies water in 12 hours sets.

Proposed Use

No change in purpose of use is proposed in the change application. Agricultural irrigation is considered a beneficial use of water (RCW 90.54.020(1)).

Water Quantities

The Water Resources Management Program for the Entiat River Basin (Chapter 173-546 WAC) estimates the water requirements for pasture at 31.68 inches (2.64 feet) per acre per irrigation season as a standard Crop Irrigation Requirement. The applicants have older irrigation systems which both should be at least 65% efficient.

The Wicks irrigate a total of 3.5 acres which includes 3.2 acres of pasture (alfalfa and hay) and several fruit trees estimated to amount to 0.3 acres. Their Total Irrigation Requirement (TIR) is estimated to be 14.2 ac-ft/yr (2.64*3.5/0.65). While we note that trees have slightly different water needs than pasture, the applicants' fruit trees are not part of a commercial project, and are watered consistently with the rest of the property; thus no special water duty has been assigned based on orchard production.

The Tippens irrigate 3.4 acres of mixed pasture, hay and alfalfa, with a TIR of 13.8 ac-ft/yr (2.64*3.4/0.65).

It is noted that these calculations are only a tentative determination of the extent and validity of the claim, and intended only to approximate water use based on our current understanding of installed infrastructure. The tentative determination represents the quantities of water that may be available for change by Ecology. The quantities ultimately established in an adjudication process will be determined by a superior court. Ecology lacks the authority to conduct adjudications.

Other Rights Appurtenant to the Place of Use

Water Right Claim No. 153189 – John A. Bortz

Water Right Claim 153189 was filed by John A. Bortz, asserting a right to 1.0 cfs, 24 ac-ft/yr, for the irrigation of 6 acres from April through September from a point of diversion on the Entiat River located 190 feet north and 430 feet east of the southwest corner of section 11, in the SW¼ of the SW¼ of Section 11, T. 25 N., R. 20 E.W.M; this POD location is different from the claimed POD in Water Right Claim No. 158608. The claimed date of first putting water to use is April 1911. The claim form states that 1 cfs, 12 ac-ft/yr, for the irrigation of 3 acres was used at the time the claim was filed. Water diverted under this claim has been combined with diversions under the subject claim, Water Right Claim No. 158608.

Water Right Claim No. 099107 – John A. Bortz

Water Right Claim No. 099107 was filed by John A. Bortz asserting a right to 3 gpm, unknown annual quantity, from a well for continuous domestic supply. The claim lists the well location as within Section 11, T. 25 N., R. 20 E.W.M. A map submitted with the claim shows the well located within the SW¼SW¼ of Section 11. This claim likely asserts a right to the domestic supply for the Wick household.

Hydrologic/Hydrogeologic Evaluation

Located in Chelan County, the Entiat River Basin (WRIA 46) encompasses both the Entiat River and the Mad River watersheds and minor tributaries, consisting of approximately 305,641 acres. The Entiat River flows 43 miles in a southeasterly direction from its headwaters in glaciated basins 4.5 miles east of the Cascade crest to its confluence with the Columbia River near the city of Entiat. Numerous tributaries flow into the Entiat River during its course to the confluence at river mile 483 on the Columbia, approximately 20 miles north of Wenatchee. The topography of the area varies between rolling hills near the river mouth to steep uplifted mountains near the headwaters, with glaciated features most evident in the upper half of the Entiat basin.

Alluvial fans are present where tributaries transported eroded soil and bedrock downhill to the Entiat River floodplain. Mean annual runoff for the Entiat basin varies widely throughout the period of measurement, indicating a snowmelt dominated system that relies on the alluvial and glacially derived sediments in the valley bottoms as primary storage for groundwater in the Entiat basin (EWPU 2004).

Hydrologic/Hydrogeologic Evaluation

Location
The Entiat and Mad River Basins combine to form Water Resources Inventory Area (WRIA) 46 on the eastern slopes of the Cascade Mountain Range, Chelan County, Washington. The Entiat River flows approximately 43 miles from its headwaters in glaciated basins near the Cascade Crest to its confluence with the Columbia River (Columbia RM 482.7) near the Town of Entiat.

Topography
Topography within the Entiat Basin varies significantly, with rolling hills and alluvial deposits found in the lower elevations, while upper elevations are characterized by steeper, glacially modified valleys. Maximum elevations of approximately 6000 feet are found near the headwaters, falling to approximately 700 feet at the river's confluence with the Columbia.

Hydrology
The Entiat River experiences very high stream flows in the late spring and early summer (May and June mean monthly streamflow in the order of 1500 cfs), and very low flows during late summer to early spring (September to February mean flows in the order of 170 cfs). Snowmelt is the predominant source of both surface and ground water in the Entiat, and generally there is a high degree of connectivity between ground and surface water sources in the watershed. The watershed also includes several perennial (year-round) and intermittent (seasonal) streams that flow into the larger rivers.

Land Ownership and Use
The majority of land within WRIA 46 is publicly owned (Federal, State and Local), with less than 9% being privately held. Current land uses include agriculture (primarily fruit orchards), livestock, timber, residential housing and recreation. Over 60% of the watershed falls within various types of reserves (wilderness, old growth, wildlife etc).

Climate
Climate in WRIA 46 is strongly influenced by orographic effects of the Cascade Range, with lower temperatures and higher rates of precipitation in the higher elevation (western) portions of the watershed. Precipitation ranges from up to 90 inches per year near the crest of the Cascades, to less than 10 inches per year near the confluence. The majority of precipitation (75%) falls between the months of October and March, with most precipitation falling as snow, especially in the higher elevations.

Geology / Hydrogeology
The Entiat River Valley is bounded by igneous and metamorphic bedrock, including gneiss, schist, granite, gabbro, diorite and granodiorite. Permeability of the bedrock units is typically low, although aquifers can be formed in more fractured and or weathered units. Unconsolidated glacio-fluvial deposits composed of cobbles, gravels, sands, with lesser quantities silt and clay are common in the valleys, especially in the lower elevations.

The coarse nature of these deposits results in a relatively high hydraulic conductivity. Riverbed materials appear to be derived from the same parent material (glacio-fluvial deposits), and as a result a very high level of interconnectivity between the alluvial sediments and the river is expected. The high hydraulic conductivity of the alluvial aquifer, coupled with a strong connection to the Entiat River result in the alluvial deposits locally forming highly productive aquifers.

The lateral and vertical bounding of the unconsolidated glacio-fluvial aquifer by lower permeability igneous and metamorphic rocks, coupled with the high level of connectivity between the unconsolidated aquifer and the river, likely result in a semi-closed system, where the river and the adjacent unconsolidated aquifer essentially perform as a single hydraulic unit. During the wet season, when river levels are higher, the river likely loses water to the aquifer (recharge) while during the dry (irrigation) season, the aquifer likely loses this water back to the river in most areas.

The proposed source of supply for the change application is a shallow drilled well completed in the unconsolidated alluvial aquifer at a depth of 75 feet. The distance between the well and the Entiat River is approximately 50 feet. Stratigraphic descriptions from the water well report, coupled with a 4 hour duration pump test confirm the highly permeable nature of the unconsolidated aquifer in which the well is completed. The high permeability of the aquifer material and a significant saturated thickness (in excess of 70 feet) result in a highly transmissive aquifer in which large quantities of water can be pumped with relatively minimal drawdown. The Entiat River creates a boundary constant head condition that further restricts potential drawdown impacts to the aquifer and other existing wells.

Tippen/Wick Well
The Tippen/Wick well (AEG337) was drilled in September of 2006 by Irrigation Technology and Control Inc., to a depth of 75 feet. The well is screened between 60 and 70 feet below ground surface in a sand and gravel aquifer. Static depth to water at the time of construction was 9.25 feet. Pump testing at various discharge rates was performed a few weeks after construction, yielding specific capacities ranging from 6.1 gpm per foot of drawdown to 7.2 gpm per foot of drawdown. These relatively high specific capacity numbers are indicative of a high transmissivity aquifer.

Impairment Considerations

Impairment of Minimum Instream Flow Water Rights

Adopted in 2005, Chapter 173-546 WAC established a minimum instream flow for the three stream management units in the Entiat River Basin WRIA 46. The applicant's project is located within the Lower Entiat stream management unit that extends from the confluence of the Entiat and Columbia Rivers to Entiat river mile 16.2. The subject claim predates the September 3, 2005 priority date of the minimum instream flow; therefore, withdrawals asserted under the claim are not subject to curtailment when minimum instream flow levels are not met.

Impairment of Other Water Right Holders

As discussed previously, during the irrigation season, the river is likely receiving recharge from the adjacent unconsolidated aquifer. Thus water pumped from the proposed POW will either be water that would have ended up in the river shortly thereafter, or could in fact be water that is being pulled from the river if hydraulic gradients are reversed by pumping. In either case, no significant change in the overall water budget is expected, with an essentially identical quantity of water being available in the river downstream from the point of withdrawal regardless of whether the source water is removed via surface water diversion or the groundwater point of withdrawal.

The proposed POW location is less than 50 feet inland from the claimed POD. No points of diversion are in the vicinity. The closest POW is the proposed POW owned by Russell Griffith, approximately 110 feet to the northwest.

Regulation of Water Rights

All water rights are subject to curtailment based on the priority system, whereby senior rights must be satisfied before a junior right may divert water. In order to preserve the integrity of the priority system when a surface water intake is changed to a well, water use at the new well must managed in the same manner as the original diversion point.

If a situation occurs in which the priority system mandates that diversions under the subject rights must be curtailed, all withdrawals from the authorized well must be curtailed until all senior water rights downstream of the original point of diversion are fulfilled. Given the close connection of ground water and surface water in this project, stopping withdrawals from the well should have a fairly immediate effect on stream flows. We note that it appears that water shortages and curtailment of junior water rights in favor of senior rights has not been an issue in this immediate area, and this proposed change is unlikely to result in any new supply problems.

Public Interest Considerations

The project is located in the Enitat subbasin and will benefit Upper Columbia steelhead, spring Chinook and bull trout. Discontinuing the direct surface water diversion will prevent ESA listed juvenile salmon and other fish death from being sucked into the irrigation system and eliminate water quality impacts associated with the annual maintenance of the instream pushup dam. This project is consistent with the goals of the Entiat WRIA 46 Watershed Management Plan approved in 2004 as well as the draft Upper Columbia Salmon Recovery Plan.

In general, removing 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 maintain pushup dams. Use of the new well alleviates the need for repeated construction in the river and the associated disturbances from increased silt loading and streambank modifications.

CONCLUSIONS

After consideration of the facts presented in this report, the author makes a tentative determination that:

- Water has been put to beneficial use as asserted under Water Right Claim No. 158608.
- The subject water right claim will not be enlarged by approving the change to a point of withdrawal. The quantities of water withdrawn at the authorized point of withdrawal are limited to the quantities historically put to beneficial use, as listed on the cover page of this report.
- A change to a point of withdrawal of water for beneficial use is allowed by law.
- The proposed changes will not impair existing water rights or claims.
- The proposed changes are not detrimental to the public interest.

RECOMMENDATIONS

Based on the above investigation and conclusions, the author recommends that the request for change to Water Right Claim No. 158608 be approved in the amounts and within the limitations listed below and subject to the provisions beginning on Page 2, et seq.

Purpose of Use and Authorized Quantities

The applicant intends to use the proposed POW to withdraw water claimed under Water Right Claim Nos. 158608 (the subject of this report) and 153189. The instantaneous withdrawal rate (Qi) of both claims will be limited to the maximum pumping rate of the installed pump, 175 gpm. Additionally , the Qi stated on all superseding documents will be non-additive, as all withdrawals under Water Right Claim Nos. 158608 and 153189 cannot exceed the maximum pumping rate of 175 gpm.

Due to the combined management of the claims, it is impossible to determine which portion of Water Right Claim No. 158608 is appurtenant to the portions of the POU owned by the Tippens and Wicks. Additionally, it is impossible to discern water historically diverted under Water Right Claim No. 158608 from water diverted under Water Right Claim No. 153189. Therefore, the recommendations for the annual quantity (Qa) for each applicant are considered non-additive for all withdrawals asserted under Water Right Claim No. 158608 and Water Right Claim No. 153189. This ROE cannot authorize a quantity of water greater than what is listed on the original claim form.

The irrigated acreage authorized for a change is limited to the number of acres to which water has historically been put to beneficial use, not to exceed the irrigated acres claimed on Water Right Claim 158608. The tentative determination in this report is the Wicks irrigate 3.5 acres and the Tippens irrigate 3.4 acres, for a total of 6.9 acres. Water Right Claim No. 158608 asserts a right to irrigate 6 acres. The 0.9 acres of irrigation that exceed the claimed acreage may be covered by Water Right Claim No. 158609 which asserts a right to irrigate 6 acres; this is addressed in a separate ROE.

The author recommends administratively dividing the claims into (A) and (B) portions to reflect the Wicks' and Tippens' desires to have separate water right documents and for future ease of water right management. Also, the author recommends proportionally dividing the asserted right under Water Right Claim No. 158608 based on each applicant's percent of the total irrigated acres and provisioning each portion of the claim to limit total withdrawals to the amount historically put to beneficial use under Water Right Claim No. 158608 and 153189:

> WRC 158608 (A) – Issued to Bruce and Sandra Wick in the amount of 175 gpm, 12.2 ac-ft/yr, from April 1 through September 30 for the irrigation of 3 acres.

The author recommends the following provisions be added to the ROE and superseding document:

1. Use under Water Right Claim No. 158608 (A) and (B), and Water Right Claim No. 153189 (A) and (B) are limited to a combined maximum instantaneous rate of withdrawal of 175 gallons per minute and a combined maximum annual quantity of 28 acre-feet per year for the irrigation of 6.9 acres.

2. Use under Water Right Claim No. 158608(A) and Water Right Claim No. 153189(A) are limited to a maximum annual quantity of 14.2ac-ft/yr, for the irrigation of 3.5 acres from April 1 through September 30.

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. The Reports of Examination issued for *Application for Change* Nos. CS4-WRC153189@1, CS4-WRC153189@2, CS4-WRC158608@1, and CS4-WRC158608 @2 authorize a combined maximum withdrawal of:

- 175 gallons per minute
- 28 acre-feet per year
- Irrigation of 6.9 acres from April 1 through September 30

Point of Withdrawal

600 feet east and 150 feet north of the southwest corner of Section 11, within the SW¼, SW¼, Section 11, Township 25 North, Range 20 E.W.M.

Place of Use

Lot 1 of Gibson Short Plat, Subdivision No. 1171, Chelan County, located in Section 11, T. 25 N., R. 20 E.W.M. Parcel number 252011330150.

Report by: Taylor Horne
Taylor C. Horne

01.14.2010
Date

REFERENCES

Dixon, R.M. 2003. *Use of a GIS-based Hydrogeologic Database to Estimate Groundwater Storage Volumes and Annual Recharge Volumes within the Entiat River Valley, Chelan County, Washington.* Washington Department of Ecology draft unpublished report. Prepared for the Entiat WRIA Planning Unit. Yakima, WA: WDOE Central Regional Office.

USFS WNF. 1996. *Watershed assessment Entiat analysis area, v2.0.* US Forest Service Wenatchee National Forest, Entiat Ranger District, Entiat, WA.

Entiat Watershed Planning Unit. *Entiat WRIA 46 Plan & Appendices*. October 2004. <http://www.cascadiacd.org/index.php?page_id=255>.

Chelan County Conservation District (NOTE: Renamed "Cascadia Conservation District"). *Detailed Implementation Plan, Entiat Water Resource Inventory Area (WRIA) 46 (EWPU DIP).* February 2006. <http://www.cascadiacd.org/files/documents/Entiat_FinalDIP_022106.pdf>.

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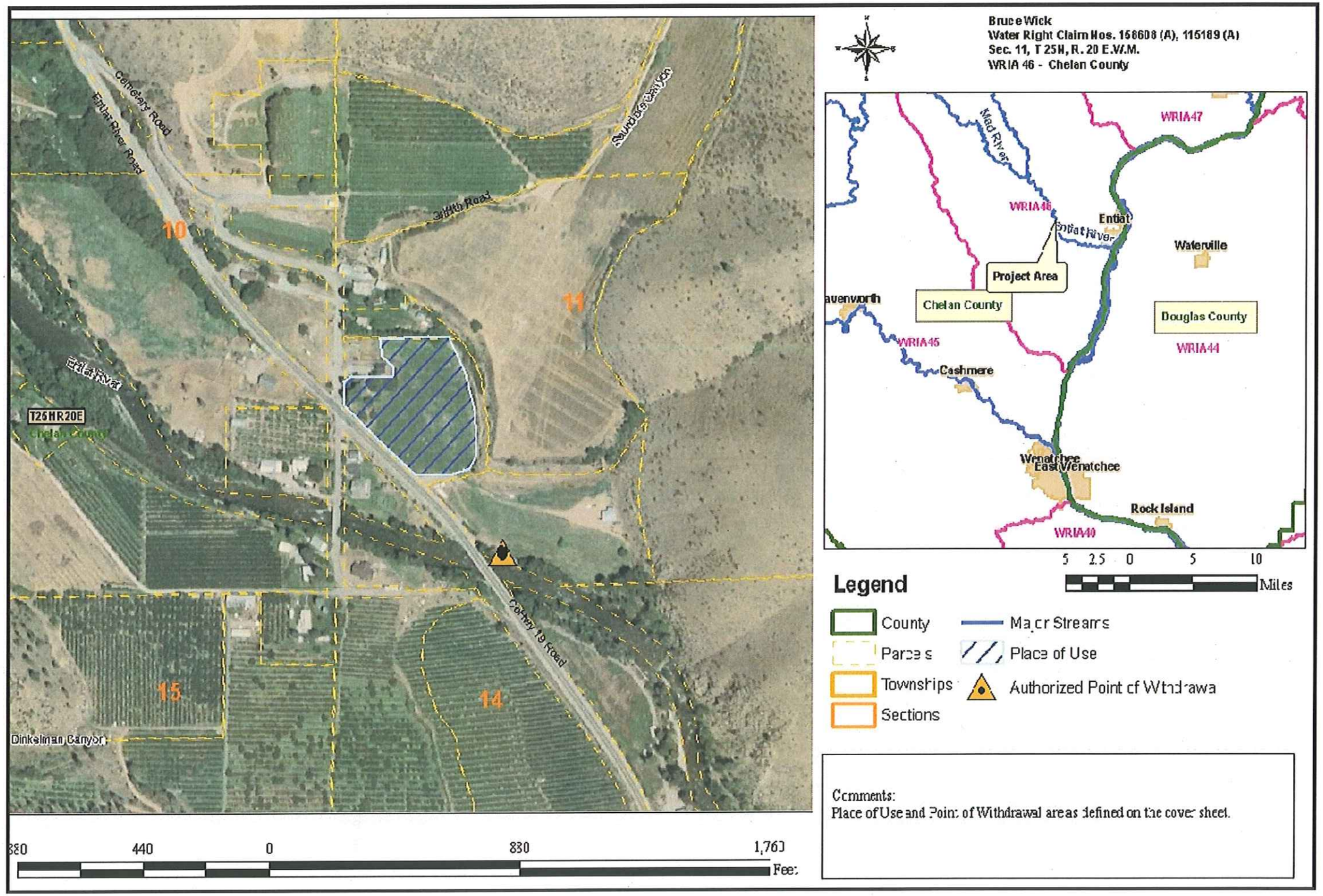
Bruce Wick
Water Right Claim Nos. 158608 (A), 115189 (A)
Sec. 11, T 25N, R. 20 E.W.M.
WRIA 46 - Chelan County
Cemetery Road
Tarlton River Road
Griffith Road
Squilchuck Canyon
Entiat River
T26NR20E
Chelan County
Dinkelman Canyon
Cowiche Road
10
11
15
14
WRIA47
Mad River
WRIA46
Entiat
Entiat River
Waterville
Project Area
Chelan County
Douglas County
WRIA45
WRIA44
Cashmere
East Wenatchee
Rock Island
WRIA40
5 2.5 0 5 10
Miles
Legend
County
Parcels
Townships
Sections
Major Streams
Place of Use
Authorized Point of Withdrawal
Comments:
Place of Use and Point of Withdrawal areas defined on the cover sheet.
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