File NR: G4-35604
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DEPARTMENT OF ECOLOGY
State of Washington

State of Washington
REPORT OF EXAMINATION
FOR WATER RIGHT APPLICATION

PRIORITY DATE
March 18, 2013

WATER RIGHT NUMBER
G4-35604

MAILING ADDRESS
R&R HEIGHTS LAND COMPANY INC.
C/O ANNE WATANABE
PO BOX 687
ROSLYN WA 98941-0687

SITE ADDRESS (IF DIFFERENT)
SR 903 AND R & R HEIGHTS DRIVE
RONALD, WA 98940

Quantity Authorized for Withdrawal or Diversion

WITHDRAWAL RATE	UNITS	ANNUAL QUANTITY (AF/YR)
50.72	GPM	28.00

Purpose

PURPOSE	WITHDRAWAL OR DIVERSION RATE ADDITIVE	WITHDRAWAL OR DIVERSION RATE NON-ADDITIVE	UNITS	ANNUAL QUANTITY (AF/YR) ADDITIVE	ANNUAL QUANTITY (AF/YR) NON-ADDITIVE	PERIOD OF USE (mm/dd)
Domestic Multiple	50.72		GPM	28.00		01/01 - 12/31

REMARKS

For the proposed 100 connections under this approval, the instantaneous quantity from the well identified by Ecology's unique well tag # AFH-678 shall not exceed 50.72 gallons per minute (gpm).

This source was previously authorized for up to 49.28 gpm for an additional 11 connections. This authorization allows an additive instantaneous quantity of 50.72 gpm from the same source; therefore, the total instantaneous quantity from this source between both authorizations is 100 gpm.

Irrigation, including Incidental lawn and/or garden is not authorized by this approval.

IRRIGATED ACRES ADDITIVE	IRRIGATED ACRES NON-ADDITIVE	PUBLIC WATER SYSTEM INFORMATION WATER SYSTEM ID	PUBLIC WATER SYSTEM INFORMATION CONNECTIONS
0	0	AB326D (Mountain Ridge)	100*

*Upon Department of Health (DOH) approval of a Group A water system.

FILE COPY

Source Location

COUNTY	WATERBODY	TRIBUTARY TO	WATER RESOURCE INVENTORY AREA
KITTITAS	GROUNDWATER		39-UPPER YAKIMA

SOURCE FACILITY/DEVICE	PARCEL	WELL TAG	TWP	RNG	SEC	QQ Q	LATITUDE	LONGITUDE
1 well	146134	AFH-678	20N	15E	18	SWNE	47.22961	-121.01276

Datum: NAD83/WGS84

Place of Use (See Attached Map)

PARCELS (NOT LISTED FOR SERVICE AREAS)

20257 thru 20265, 952016 thru 952019, 955371, 949604, 13509 thru 13511, 20253 thru 20255, 146134, and 18416.

LEGAL DESCRIPTION OF AUTHORIZED PLACE OF USE

Parcels A, B, C, D, E, F, G, H, and J, K, L, M, N, and P, AND Parcels 1-7, all as delineated on that certain survey recorded April 30, 2008, in Book 35 of Surveys at page 26 under Kittitas County Auditor's File No. 200804300032, all being a portion of Sections 7 and 18, T. 20 N., R. 15 E.W.M., Kittitas County, state of Washington.

Proposed Works

The subject well was drilled in 2001 (Ecology unique well ID # AFH-678) to a depth of 412 feet with a 6-inch casing. Water is delivered by a single phase, 1 HP submersible pump and a single phase, 3 HP submersible booster pump, which use two Wellrite 120-gallon pressure tanks to deliver water through a 2-inch distribution line, splitting off to a 2-inch and an 8-inch line, which then feeds water to a Norwesco 65,000-gallon-capacity steel water storage tank. Flow meter and lot meters are installed.

Mountain Ridge is a Department of Health (DOH)-approved Group B community, private water system for up to 14 connections and will be regulated by DOH. There are 8 existing connections on the system, which do not need mitigation and there are 11 connections previously approved under G4-35551P from the subject source, and this proposal seeks to add another 100 connections, although at the time of this writing, DOH has not yet approved the expansion to a Group A water system. Parcel Nos. 18400, 18403, 18405, 18417, 126134, and 306134 will still require mitigation to use water and must be connected to service by April 1, 2014. With this proposal, this source is approved to supply water to up to 119 connections.

Domestic wastewater will be discharged to an individual or group on-site septic system, pursuant to the *Declaration of Covenant*, signed April 15, 2013, by subject applicant.

Development Schedule

BEGIN PROJECT	COMPLETE PROJECT	PUT WATER TO FULL USE
Begun	December 31, 2031	December 31, 2033

In determining the timeframe of the above Development Schedule, that is the amount of time for the applicant to implement the authorized use of water, a reasonable and just time was considered and

allowed under the existing conditions to complete construction of the project. Sufficient time was also awarded in order for the applicant to collect water-use data and to put the water to full beneficial use. The **Development Schedule** reflects consideration of the cost and magnitude of the project and the potential engineering and physical features typically to be encountered.

Measurement of Water Use

How often must water use be measured?	Weekly
How often must water use data be reported to Ecology?	Annually (Jan 31)
What volume should be reported?	Total Annual Volume
What rate should be reported?	Annual Peak Rate of Withdrawal (gpm)

Provisions

A. Wells, Well Logs and Well Construction Standards

1. The subject well and the right to use water from it are restricted to and authorized for the Roslyn Formation abandoned coal Seam 1 Reservoir 2, per the recommendation presented by Anna Hoselton, Ecology licensed hydrogeologist.[1]
2. All wells constructed in the state shall meet the construction requirements of WAC 173-160 titled "Minimum Standards for the Construction and Maintenance of Wells" and RCW 18.104 titled "Water Well Construction." Any well which is unusable, abandoned, or whose use has been permanently discontinued, or which is in such disrepair that its continued use is impractical or is an environmental, safety or public health hazard shall be decommissioned.
3. All wells shall be tagged with a Department of Ecology unique well identification number. If you have an existing well and it does not have a tag, please contact the well-drilling coordinator at the regional Department of Ecology office issuing this decision. This tag shall remain attached to the well. If you are required to submit water measuring reports, reference this tag number.
4. Installation and maintenance of an access port as described in WAC 173-160- 291(3) is required.
5. Any replacement well(s) allowed under RCW 90.44.100 shall require construction oversight by a hydrogeologist licensed in the state of Washington and who can demonstrate a working knowledge of geologic and groundwater conditions that result from historic mining activities
6. Any replacement well(s) allowed under RCW 90.44.100 shall require notification to Ecology's well construction coordinator.

B. Measurements, Monitoring, Metering and Reporting

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," WAC 173-173.
2. Water-use-data shall be recorded weekly and maintained by the property owner for a minimum of five years. The maximum rate of withdrawal and the annual total volume shall be submitted to the Department of Ecology by January 31st of each calendar year.

[1] Anna Hoselton, *Technical Memorandum*, dated September 24, 2013, p. 17.

3. 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.

4. WAC 173-173 describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition the Department of Ecology for modifications to some of the requirements.

C. Water Level Measurements

1. In order to maintain a sustainable supply of water and ensure that your water source is not impaired by future withdrawals, static water levels **shall** be measured and recorded monthly using a consistent methodology. Static water level is defined as the water level in a well when no pumping is occurring and the water level has fully recovered from previous pumping. Static water level data **shall** include the following elements:
   - Unique Well ID Number.
   - Measurement date and time.
   - Measurement method (air line, electric tape, pressure transducer, etc.).
   - Measurement accuracy (to nearest foot, tenth of foot, etc.).
   - Description of the measuring point (top of casing, sounding tube, etc.).
   - Measuring point elevation above or below land surface to the nearest 0.1 foot.
   - Land surface elevation at the well head to the nearest foot.
   - Static water level below measuring point to the nearest 0.1 foot.

D. Department of Health Requirements

1. Prior to any new construction or alterations of a public water supply system, the State Board of Health rules require public water supply owners to obtain written approval from the Office of Drinking Water of the Washington State Department of Health (DOH). Please contact the Office of Drinking Water prior to beginning (or modifying) your project at:

   DOH/Division of Environmental Health
   16201 E. Indiana Avenue, Suite 1500
   Spokane Valley, WA 99216
   (509) 329-2100

E. Water Use Efficiency

1. The water right holder is required to maintain efficient water delivery systems and use of up-to-date water conservation practices consistent with RCW 90.03.005.

F. Proof of Appropriation

1. Final beneficial use calculations for each connection, either independently or combined, shall be determined during the investigation at the Proof of Appropriation stage.

2. The water right holder shall 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 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.

G. Schedule and Inspections

1. 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.

H. Other Conditions

1. This authorization shall in no way excuse the permittee from compliance with any federal, state, or local statutes, ordinances, permits, or regulations including those required and administered by other programs of the Department of Ecology.

2. You (applicant) will pay the sum of **$3,864.96**, which represents a proportionate amount of the payment due and owing to the United States for storage and delivery of water under Paragraph 15(a) of Water Storage and Exchange Agreement Contract No. 09XX101700 (Storage Contract).[2] The consumptive use of 4.880 acre-feet from September 1 through March 1 is subject to the terms and conditions in the Storage Contract.

3. You (applicant) will record with the Kittitas County Auditor a property covenant as required under WAC 173-539A-050 that restricts or prohibits trees or shrubs over a septic drain field on Parcel Nos. 20257, 20258, 20259, 20260, 20261, 20262, 20263, 20264, 20265, 952016, 952017, 952018, 952019, 955371, 949604, 13509, 13510, 13511, 20253, 20254, 20255, 146134, and 18416.

4. You (applicant) will record with the Kittitas County Auditor an appropriate conveyance instrument under which the applicant obtains an interest in Trust Water Right No. CS4-02316sb8(a1) to offset consumptive use.

5. Any valid priority calls against the source Trust Water Right No. CS4-02316sb8(a1), based on local limitations in water availability, will result in temporary curtailment of the use of water under the Permit until the priority call for water ends.

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[2] "Long-Term Water Storage and Exchange Agreement between the United States and the state of Washington Department of Ecology," Bureau of Reclamation, Yakima, Washington, January 29, 2009, pp. 11-13.

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. G4-35604, 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 RCW 43.21B and WAC 371-08.

"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
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
Pollution Control Hearings Board 1111 Israel RD SW Ste 301 Tumwater, WA 98501	**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 20 day of MARCH, 2014.

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

If you need this document in a format for the visually impaired, 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.

BACKGROUND

This report serves as the written findings of fact concerning Water Right Application Number G4-35604.

Priority Processing

This application is being priority processed because it qualified under the criteria under which an application may be processed prior to competing applications (WAC 173-152).

On March 18, 2013, R & R Heights Land Company, Inc. submitted an application to the Department of Ecology (Ecology), requesting a new appropriation of water with the following parameters:

Table 1: Summary of "Requested" Water Right

Applicant Name	R&R Heights Land Company Inc
Date of Application	March 18, 2013
Place of Use	Parcels A, B, C, D, E, F, G, H, and J, K, L, M, N, and P, and Parcels 1-7, all as delineated on that certain survey recorded April 30, 2008 in Book 35 of Surveys at page 26 under Kittitas County Auditor's File No. 200804300032 all being a portion of Sections 7 and 18, T. 20 N., R. 15 E.W.M., Kittitas County, state of Washington. (Parcel Nos. 20257-20265, 952016-952019, 955371, 949604, 13509-13511, 20253-20255, 146134, and 18416.)

County	Waterbody	Tributary To	WRIA
Kittitas	Groundwater		39-Upper Yakima

Purpose	Rate	Unit	Ac-ft/yr	Begin Season	End Season
Domestic Multiple	100	GPM	11.762	01/01	12/31

Source Name	Parcel	Well Tag	Twp	Rng	Sec	QQ Q	Latitude	Longitude
1 Well	146134	AFH-678	20N	15E	18	SW NE	N/A	N/A

GPM = Gallons per Minute; Ac-ft/yr = Acre-feet per year; Sec. = Section; Twp. = Township, Rng.= Range,
QQ Q = Quarter-quarter of a section; WRIA = Water Resource Inventory Area;
E.W.M. = East of the Willamette Meridian; Datum: NAD83/WGS84.

On August 21, 2013, the applicant amended the original application to change the annual quantity requested. The corrected parameters follow:

Table 2: Summary of "Amended Requested" Water Right

Date of Amendment	August 21, 2013
Amended Annual Water Duty	28.00 Ac-ft/yr Total 8.4 Ac-ft/yr (CU)

Legal Requirements for Approval of Appropriation of Water

The place-of-use (POU) of this proposal is located wholly within the area covered by the Upper Kittitas Groundwater Rule, WAC 173-539A and this application is subject to the provisions of this rule, which provides that all new groundwater withdrawals in the area must be water-budget-neutral.

RCWs 90.03 and 90.44 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 90.03.250 through 90.03.340 and RCW 90.44.050. In accordance with RCW 90.03.290, determinations must be made on the following four criteria in order for an application for water rights to be approved:

- Water must be available.
- There must be no impairment of existing rights.
- The water use must be beneficial.
- The water use must not be detrimental to the public interest.

Public Notice

RCW 90.03.280 requires that notice of a water right application be published once a week, for two consecutive weeks, in a newspaper of general circulation in the county or counties where the water is to be stored, diverted, and used. Notice of this application was published in The Daily Record on June 22 and 29, 2013. An amended notice of this application was published in The Daily Record on September 10 and 17, 2013, which corrects the annual quantity of water requested.

Consultation with the Department of Fish and Wildlife

The Long-Term Water Storage and Exchange Agreement between the United States and the State Department of Ecology and the Yakima River Mitigation Water Services LLC Trust Water Agreement require that Ecology must give notice to the Department of Fish and Wildlife of applications to divert, withdraw, or store water, and to present the project to the Water Transfer Working Group (WTWG). Notice was officially provided on November 4, 2013, by Ecology personnel during a WTWG meeting. A positive reaction was communicated in response to this proposal.

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:

(a) It is a surface water right application for more than 1 cubic-foot 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.

(b) It is a groundwater right application for more than 2,250 gallons per minute (gpm).

(c) It is an application that, in combination with other water right applications for the same project, collectively exceed the amounts above.

(d) 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).

(e) 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 for Water Resources, it is categorically exempt from SEPA and a threshold determination is not required.

INVESTIGATION

Proposed Use and Basis of Water Demand

The DOH-approved Group B water system, Mountain Ridge, became effective on February 2, 2006, and is currently approved for 14 connections of which 8 connections pre-exist. Eleven more connections, authorized under G4-35551P and the 100 connections proposed under this application are part of a proposed expansion to a Group A water system. The name, Mountain Ridge will remain the same, but approval from DOH is still pending. The source is metered.

The December 2009 Water System Design Manual[3] (WSDM) by DOH contains guidance for establishing water demands. The suggested methods, in order of preference, include:

1. Metered water production and use records.
2. Comparable metered water production and use data from analogous water systems. See WAC 246-290-221(3)(a) and Section 5.2.3.
3. The criteria presented in Chapter 5.

According to the WSDM, new systems or existing water systems that have no source meter records, information can be obtained from analogous water systems or from information presented in Appendix D of the WSDM in order to estimate the Average Daily Demand (ADD) and the Maximum Daily Demand (MDD) for residential connections (WAC 246-290-221(3)).[4] Analogous water systems are defined in Section 5.2.3 of the WSDM as systems requiring similar characteristics, including "demographics, housing sizes, income levels, lot sizes, climate, water-pricing structure, conservation practices, use restrictions, and soils and landscaping."[5] As such, a reasonable level for a MDD for internal uses can be established at 350 gallons per day (GPD)/Equivalent Residential Unit (ERU); however, DOH recognizes that there may be some projects with sufficient information to support a MDD of less than 350 GPD/ERU depending upon unique conditions.

Under WAC 173-539A, 30% domestic in-house use on a septic system is assumed to be consumptively used. Monthly and annual use at full build out of the project were calculated based on the proposed 100 ERUs and the applicant's proposed 250 GPD, based on the recreational, part-time nature of each residence. The calculated consumptive use and total calculation considered factors specified in WAC 173-539A and are summarized in **Table 3** below.

Table 3: *Estimated Total and Consumptive Use

[3] Department of Health, *Water System Design Manual*, Olympia, Wa., 2009, pp. 27-32, www.doh.wa.gov/chp/dw/Publications/331-123.pdf, accessed on May 30, 2012.

[4] Ibid., p. 28.

[5] Ibid., p. 31.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total Use (ac-ft)	2.4	2.1	2.4	2.3	2.4	2.3	2.4	2.4	2.3	2.4	2.3	2.4	**28.00**
Total Consumptive (ac-ft)	0.71	0.64	0.71	0.69	0.71	0.69	0.71	0.71	0.69	0.71	0.69	0.71	**8.40**

Proposed Mitigation

The applicant intends to mitigate for consumptive use under the requested appropriation through the purchase of the Crushe, LLC-portion of Upper Kittitas mitigation credits through the Yakima River Mitigation Water Services, LLC (YRMS) Water Exchange. The YRMS Water Exchange was established by transferring a portion of Court Claim No. 02316 into the Trust Water Right Program (TWRP). Consumptive loss resulting from the applicant's proposed use will be offset with Trust Water Right No. CS4-02316sb8(a1).

Other Rights Appurtenant to the Place of Use

There are several water rights and several applications seeking new water appropriations that are appurtenant to the proposed place-of-use (POU) and are described in **Attachment 2**.

Impairment Considerations

Impairment is an adverse impact on the physical availability of water for a beneficial use that is entitled to protection. A water right application may not be approved if it would:

- Interrupt or interfere with the availability of water to an adequately constructed groundwater withdrawal facility of an existing right. An adequately constructed groundwater withdrawal facility is one that:

  (a) is constructed in compliance with well construction requirements, and

  (b) fully penetrates the saturated zone of an aquifer or withdraws water from a reasonable and feasible pumping lift.

- Interrupt or interfere with the availability of water at the authorized point of diversion of a surface water right. A surface water right conditioned with instream flows may be impaired if a proposed use or change would cause the flow of the stream to fall to or below the instream flow more frequently or for a longer duration than was previously the case.

- Interrupt or interfere with the flow of water allocated by rule, water rights, or court decree to instream flows.

- Degrade the water quality of the source to the point that the water is unsuitable for beneficial use by existing users (e.g., via sea water intrusion).

Water Availability and Hydrogeologic Analysis

For water to be available for appropriation, it must be both physically available (productivity of the aquifer, etc.) and legally available (closure of basins to further appropriations, etc.).

Water Availability

Physical Availability

For water to be physically available for appropriation there must be ground or surface water present in quantities and quality and on a sufficiently frequent basis to provide a reasonably reliable source for the requested beneficial use or uses. In addition, the following factors are considered:

- Volume of water represented by senior water rights, including federal or tribal reserved rights or claims.
- Water right claims registered under RCW 90.14.
- Ground water uses established in accordance with RCW 90.44, including those that are exempt from the requirement to obtain a permit.
- Potential riparian water rights, including non-diversionary stock water.
- Lack of data indicating water usage can also be a consideration in determining water availability, if the department cannot ascertain the extent to which existing rights are consistently utilized and cannot affirmatively find that water is available for further appropriation.

Based on the hydrogeologic analysis described below, groundwater is physically available for the project.

Hydrologic/Hydrogeologic Evaluation

The following hydrologic/hydrogeologic technical excerpts were prepared by Anna Hoselton, licensed hydrogeologist, and reviewed by Stuart Luttrell, supervisor and licensed hydrogeologist, and seeks to address by way of discussion, analysis, and evaluation, physical water availability and the potential for impairment to existing water users. The entire Technical Memorandum may be reviewed upon request.

Physical Water Availability Discussion

While the intentional or targeted development of groundwater stored in abandoned coal mines is relatively uncommon in the state of Washington, it is a more common practice in regions of the United States where coal reserves were large and active and abandoned mine workings extensive. Experiences from these areas offer caution and insight with regard to issues such as water availability. For example, USGS Water Resources Investigation Report 92-4073, *Hydrologic Characteristics of Abandoned Coal Mines Used as Sources of Public Water Supply in McDowell County, West Virginia* by Ferrell (1992) cautions and advises that:

> Although large quantities of water are available from underground mines, many public water suppliers have experienced difficulties in obtaining dependable water supplies from coal mines because of erratic fluctuations in the quantity and chemical quality of the water. Because coal mines respond differently to pumping and recharge than do natural ground-water systems, an improved understanding of the hydrologic characteristics of underground mines is needed.
>
> The availability of water from flooded underground coal mines is determined by the presence and movement of ground water in the overburden and surrounding rock, nearby mining activities, the amount of precipitation and other sources of recharge, and characteristics of the mine. Underground mining can alter the hydrologic characteristics

of overlying and surrounding areas. Removal of coal creates large voids and can weaken overlying strata. This removal could result in fracturing of overlying strata and increased vertical permeability. During active mining, dewatering of mines also can dewater the overlying strata and deplete ground-water supplies in these strata. After abandonment and flooding of mines, openings to the mines, such as shafts and tunnels, can become outflow points for ground water.

Specific to the Roslyn area, USGS geologist, Frank A. Packard (1981) estimated the volume of water held in storage within abandoned coal mine systems based on the amount of coal removed. The volume of water was calculated separately for coal seams 1, 5, and 6 by:

(1) planimetering the mine area down dip from an assumed water level;

(2) multiplying this area by the estimated average tunnel (slope, drift) height to get the volume (man-made pore space) within mine and water-level boundaries;

(3) multiplying this volume by the estimated percentage recovery figure to get the net water-saturated pore space; and

(4) multiplying this net saturated pore space by an estimate of the porosity-effectiveness fraction to get the volume of water that will drain within a reasonable time (weeks) to wells drilled into this zone.

Packard (1981) estimated 'maximum' water levels in the mines from the elevations of a combination of spill points such as up-dip limits to barrier pillars, drift and slope entries, fan house shafts and core holes. Reservoir 1 of Seam 6 (S6R1) was excluded from his estimates because at the elevation of the tunnel spill point, if it were ever cleared of debris, the entire reservoir could be completely drained.

As stated earlier, the subject well is interpreted to withdraw groundwater associated with Packard's Seam 1, Reservoir 2 (S1R2). Packard (1981) presented his reservoir estimates as "liberal, conservative, and probable" volumes explaining that liberal estimates were based on higher elevation spill points and conservative estimates were based on lower elevation spill points. High elevation spill points were used with maximum porosity (mine void) estimates to derive liberal estimates and low elevation spill points were used with minimum porosity (mine void) estimates to derive conservative estimates. He then assumed that the probable volume "is most likely in between these two figures" and that water levels were likely closer to the low than to the high estimates due to a number of unknowns to derive the report's probable volumes.

Packard's 1981 work was published eighteen years after the last active Roslyn area mine closed in 1963 (Kittitas Co, 1999). It is now fifty years since the closure of the last active mine and more than a hundred years since mining first began in this area. Over time, it is likely that additional collapse (Ash, et al, 1953; Goode et al, 2010) of the old mine workings has occurred and that conservative porosity or void estimates are now more probable. It can also be argued that infiltration rate estimates made from mine dewatering likely reflect a cool and wet climate cycle (USGS, 2009; Hidalgo, 2004) and that they are an over-estimate for sustainable groundwater withdrawals from the reservoirs (Packard, 1981; WDOH, 2011; WDOE, CG3-21798C) because they were derived from pumping rates to completely dewater the mines. Further, scant data from the Patrick Mine well discussed above suggests, as do many studies,

that the abandoned mine groundwater systems are not well understood. Consequently, this evaluation will only consider Packard's conservative estimates of stored water volumes in further discussion.

Packard's conservative estimate for the volume of groundwater stored in S1R2 is 500 acre-feet (af). Packard also states that if emptied by pumping, the time to refill all of the reservoirs would take 6 to 7 years under normal precipitation conditions. Generally then, an annual refilling rate for S1R2 may be in the range of 71 to 83 af/yr. If evaluated individually, however, by dividing the calculated reservoir volumes by the average of Packard's estimated infiltration rates[6], then refilling times for individual reservoirs roughly correlate with the reservoir's assigned porosity values and acres of reservoir (which, for simplicity, can be thought of interchangeably as acres of recharge area). In other words, if a reservoir theoretically has a low porosity and small recharge area it has less pore space to fill and therefore should refill in a shorter period than a reservoir of higher porosity and larger recharge area when the infiltration rate is held constant. Variations[7] of this pattern will occur with various combinations of recharge area size and assigned porosity and as a result of the difference between an estimated assigned porosity and actual porosity.

For example, the low assigned porosity (0.18) and moderately large recharge area (545 acres) of the subject S1R2 in Packard's conservative model suggests a refilling time for S1R2 of about 2 ½ years when evaluated using an averaged refilling rate of 0.42 af/yr/acre of reservoir (approximately 229 acre-feet per year), assuming average precipitation conditions and no withdrawals of groundwater by water wells. This estimate, however, is dependent on and sensitive to the actual porosity of the reservoir, which is an unknown. If, however, Packard's infiltration rate is viewed as an over estimate because it represents the discharge of groundwater required to dewater the mines, it may be appropriate to only consider Packard's low end infiltration rate of 0.28 af/yr/acre of reservoir (approximately 153 acre-feet per year). At this lower infiltration rate, refilling of S1R2 may take in the range of 3 ½ years, again assuming average precipitation conditions and no withdrawals of groundwater by wells.

The estimated low and average annual refilling volume for S1R2 were considered along with the PRISM (Parameter-elevation Regressions on Independent Slopes Model) 1981-2010 precipitation data normal for the area of S1R2. Four PRISM cells overlay the S1R2 reservoir area. Calculating the average of the precipitation values from the four cells result in an average annual precipitation input value of 37.35 inches (3.11 feet). If the average annual precipitation is then distributed over the 545 acre area of S1R2, it calculates to approximately 1696 acre-feet of precipitation annually.

Of the 1696 acre-feet of annual precipitation, Packard's low end infiltration rate (153 af/yr) and the average of the high and low infiltration rates (229 af/yr) equate to 9 and 13 percent of the average precipitation over the surface area of S1R2, respectively. This suggests that up to approximately 9 to 13 percent of average annual precipitation may enter S1R2 as recharge if the

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[6] Packard estimated the highest infiltration rate into the mines at 7.66×10^{-4} (ft^3/s)/acre or 0.55 af/yr/acre of reservoir and the lowest rate to be half of that or 0.28 af/yr/acre of reservoir. The average of the two rates is 0.42 af/yr/acre of reservoir.

[7] One such variation is seen in S5R1 which was assigned a higher porosity (0.35) but has a very small recharge area (63 acres). This combination suggests a refilling time of approximately 6 years which appears to be more sensitive to the small recharge area.

reservoir is drawn down. These results compare reasonably with the mid to high end percent of annual precipitation infiltration values[8] cited by Heilweil (2007) for various sandstones by both focused (on outcrop) and direct (beneath coarse surficial soils) infiltration.

Groundwater may also enter S1R2 by leakage from the adjacent S1R1 located in the southeast corner of Section 12, T. 20 N., R. 14 E.W.M., assuming a higher hydraulic head in S1R1. Only one log for a well (ACT612) interpreted to be withdrawing water from Roslyn Seam #1 could be located[9] to the County parcel level in the south half of Section 12. When adjusted for elevation, the static water level (swl) at ACT612 may be in the range of 65 feet (depending on actual well location and elevation error) higher than the swl recorded on the log of the subject well. The two reservoirs and the two wells are separated by a barrier pillar that parallels the southeast boundary of Section 12 as shown in Packard's (1981) Figure 3. If this head relationship is correct, then groundwater withdrawals associated with S1R2 are likely to affect the rate of leakage from S1R1 into S1R2. There are about 6 existing domestic wells directly dependent on S1R1 and about 12 existing wells constructed into the overlying alluvial sediments and/or the upper portion of the URF within the horizontal boundaries of S1R1. Because of uncertainties regarding the relationship between S1R1 and S1R2, additional work to characterize groundwater exchange between them should be considered as develop interest may increase.

Additional sources of recharge to S1R2 likely include run off from Cle Elum Ridge, groundwater discharge from the up-dip URF and from surface water sources of higher head which are in contact with the URF and mine workings. Quantification of contributions from these sources is beyond the scope of this report for the following reasons including but not limited to:

(1) lack of data regarding surface water inflow and outflow to and from the mines,

(2) lack of data regarding groundwater inflow and outflow to and from the mines from up-dip regions, and

(3) lack of data regarding seasonal and annual variations in mine volumes and when there may be reservoir capacity to capture precipitation run off from Cle Elum Ridge.

Offsetting water that enters and recharges the abandoned coal mine system and specifically S1R2 is water that may discharge from mine spill points when groundwater elevations exceed spill point elevations, typically during spring freshet, rapid snow melt, or extreme precipitation events. Water lost from the abandoned coal mine system in this way can occur only when the reservoirs are already full and have no capacity for the excess water. Groundwater discharge from S1R2 to down gradient, lower head URF will also occur. Groundwater can also be discharged from S1R2, or the volume of recharge to S1R2 can be reduced by wells pumping from S1R2, by wells that capture groundwater from the alluvial sediments overlying S1R2 and by wells withdrawing groundwater from the URF overlying S1R2. Presently, however, the subject well appears to be the only existing well located within the boundaries of S1R2 that is held in Ecology's well database. Logs for one domestic well and one dry well are included in the

[8] Heilweil (2007) in previous investigations cites sandstone infiltration rates using various methods from Zhu's (2000) as 4 to 8% of precipitation; Heilweil and others (2000) as 0.5 to 15% and Flint and others (2002) as 2 to 7% giving a range of 7 to 15% alluded to above. Perhaps an outlier, Danielson and Hood's 1984 study resulted in a range of 1 to 25% using shallow borehole methods.

[9] "Located" in this case means that the owner's name on the well log was matched to the owner name of Kittitas County parcel ID number 12319.

database for Section 18, however, the coordinates for both would locate them to the east of the subject well and east of the S1R2 boundary.

Groundwater claim 98-001626, for which no well log was found, is located just south of the southeast boundary of S1R2 but will be treated as if it withdraws groundwater from and is dependent on S1R2 because (1) Kittitas Co. parcel Id #372834, on which the claim is identified, extends inside the boundary of S1R2 and (2) air photos show that structures (and electrical sources for a pump) on the parcel are located close to or within the boundary of S1R2 (Figure 3). Claim number 98-001626 claims an annual quantity of 10 af/yr from a well for the irrigation of 50 acres and cites 1930 as the date of first use.

Mitigated groundwater permit G4-35551P, authorizes a maximum of 6.199 af/yr for withdrawal from a well with unique well tag number AFH678. This existing well is the primary source for the Department of Health, Group B, Mountain Ridge Water System No. AB326D and is the same well requested under the current application G4-35604. The subject application, G4-35604, proposing to use subject well AFH678, requests a total of 28 af/yr for group domestic use.[10] Mitigation currently proposed for G4-35604 will only address effects to the Yakima main stem from about river mile 163.5 in the NE¼ SE¼ of Section 3, T. 18 N., R. 17 E.W.M. and downstream and will not, in any capacity, relieve consumptive use impacts to S1R2.

There may be in the range of 500 af of stored water in S1R2. The unknowns and uncertainties of this system are many and large while the Formation's yield is generally small. If new uses of groundwater are to be withdrawn from S1R2 and other mine reservoirs within the abandoned coal mine system, then it is likely desirable to limit withdrawals to less than the volume that can be recharged by precipitation each year for the individual reservoirs. General to reservoir specific estimates of an annual refilling volume for S1R2 range between 71 af/yr to perhaps 153 af/yr.

Given the discussion above, physical water appears to be available from S1R2. S1R2 may also be able to safely tolerate the proposed withdrawal of 28 af/yr under the subject application, G4-35604, in addition to claimed and authorized withdrawals under existing groundwater claim No. 98-001626 for 10 af/yr and G4-35551P for 6.199 af/yr. If G4-35604 is approved, all withdrawals from S1R2 would collectively total 44.199 af/yr, or approximately 62% of the low end estimate for an annual refilling volume.

General Impairment Discussion

The concepts discussed above must be evaluated when impairment is being considered. For example, to claim impairment, a senior groundwater right holder must have a qualifying groundwater withdrawal facility and be able to demonstrate that withdrawals by a junior water user are causing an interruption or interference in the availability of water. The claim must also show that there is a right to protect, and possibly other pertinent factors. Consequently when a proposed withdrawal is evaluated, consideration is given to how the withdrawal may affect other existing groundwater and surface water rights.

The proposed withdrawal under G4-35604 will capture groundwater that would otherwise discharge to the lower Cle Elum River and to the Yakima River. The captured water will not be

[10] A related and senior application, G4-35551, authorized an additional 6.199 af/yr from the same well (AFH678), for group domestic use. The combined requests, if authorized, would total 34.199 af/yr from well AFH678.

restored by mitigation water until approximately downstream of river mile 163.5 in the NE¼ SE¼ of Section 3, T. 18 N., R. 17 E.W.M. on the Yakima River mainstem and will not, in any capacity, relieve consumptive use impacts to S1R2.

Groundwater leakage from S1R1 to S1R2 will likely be increased as a result of the proposed withdrawal. The request under G4-35604 plus the existing rights within S1R2 are presently less than a conservative annual refilling volume. Consequently, if cumulative withdrawals from S1R2 are restricted to no more than a conservative annual refilling volume, then impairment to existing wells in S1R1 is not anticipated.

Careful attention was given to the existing Archie S. Patrick right, G4-00462C, that withdraws groundwater from S5R2 for a Group A public water system. The subject application, G4-35604 proposes to withdraw groundwater associated with S1R2. In the subject area, coal seam 1 occurs approximately 160 feet above coal seam 5. Because the two water systems withdraw groundwater from two vertically separated coal seams and are also separated horizontally by barrier pillars that parallel the southeast corner of Section 12, T. 20 N., R. 14 E.W.M., impairment to the Patrick right due to the request under G4-35604 is not anticipated.

Legal Availability

To determine whether water to be legally available for appropriation, the following factors are considered:

- Regional water management plans – which may specifically close certain water bodies to further appropriation.
- Existing rights – which may already appropriate physically available water.
- Fisheries and other instream uses (e.g., recreation and navigation). Instream needs, including instream and base flows set by regulation. Water is not available for out of stream uses where further reducing the flow level of surface water would be detrimental to existing fishery resources.
- The Department may deny an application for a new appropriation in a drainage where adjudicated rights exceed the average low flow supply, even if the prior rights are not presently being exercised. Water would not become available for appropriation until existing rights are relinquished for non-use by state proceedings.

When evaluating legal availability regarding applications for new groundwater permits, Ecology must statutorily limit appropriations of groundwater to:

1. Uses for a structure for which a building permit is granted and the building permit application vested prior to July 16, 2009.
2. Uses determined to be water-budget-neutral pursuant to WAC 173-539A-050.

This proposal requires 10.028 acre-feet of trust water (total consumptive use plus total to add to instream flow at Parker). Given that this proposal has acquired a portion of trust water under Trust Water Right No. CS4-02316sb8(a1) in the amount of 10.028 acre-feet, this directive will be met. These Trust Water Rights are dedicated to instream flow for water-banking-mitigation purposes for as long as the right remains in the TWRP. Such trust water right has an equal or greater contribution to flow during irrigation season as measured on the Yakima River at Parker that would serve to mitigate the proposed use for impacts to the total water supply available.

Based on the proposed mitigation and the use of the Storage Contract, groundwater is legally available for the project.

Beneficial Use

The proposed use of water for multiple domestic is defined in statute as a beneficial use (RCW 90.54.020(1)).

Public Interest Considerations

When investigating a water right application, Ecology is required to consider whether the proposal is detrimental to the public interest. Ecology must consider how the proposal will affect an array of factors such as wildlife habitat, recreation, water quality, and human health. Since there may be some uncertainties surrounding the abandoned mine system rock mechanics and how they may respond to additional groundwater withdrawals in this area, Ecology accounted for potential water-related abandoned coal mine hazards, which could ultimately cause flooding, landslides, erosion, and contamination, although no such incident has currently been reported of said hazards.

Consideration of Protests and Comments

No protests were filed against this application.

Conclusions

In conclusion:

- Water is physically available at the quantities sufficient to meet project demand. When combined with the proposed mitigation measures, water is legally available under the provisions of WAC 173-539A.
- RCW 90.54.020 recognizes domestic use as a beneficial use of water.
- Approval of the proposed appropriation will not result in impairment of existing water rights.
- Approval of the proposed appropriation is not detrimental to the public interest.

RECOMMENDATIONS

Based on the above investigation and conclusions, I recommend that this request for a water right be approved in the amounts and within the limitations listed below and subject to the provisions listed above.

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:

- 50.72 gallons per minute (gpm); the total instantaneous quantity from this source is 100 gpm.
- 28.00 acre-feet per year (af/yr).
- Continuous indoor only, multiple domestic for up to 100 residences.

Point of Withdrawal

One well (AFH-678) located approximately 1350 feet south and 1637 feet west from the northeast corner of Section 18, within the SW¼NE¼, Section 18, Township 20 North, Range 15 E.W.M.

Place of Use

As described on Page 2 of this Report of Examination.

Candis L. Graff

Candis L. Graff, Report Writer

March 19, 2014

Date

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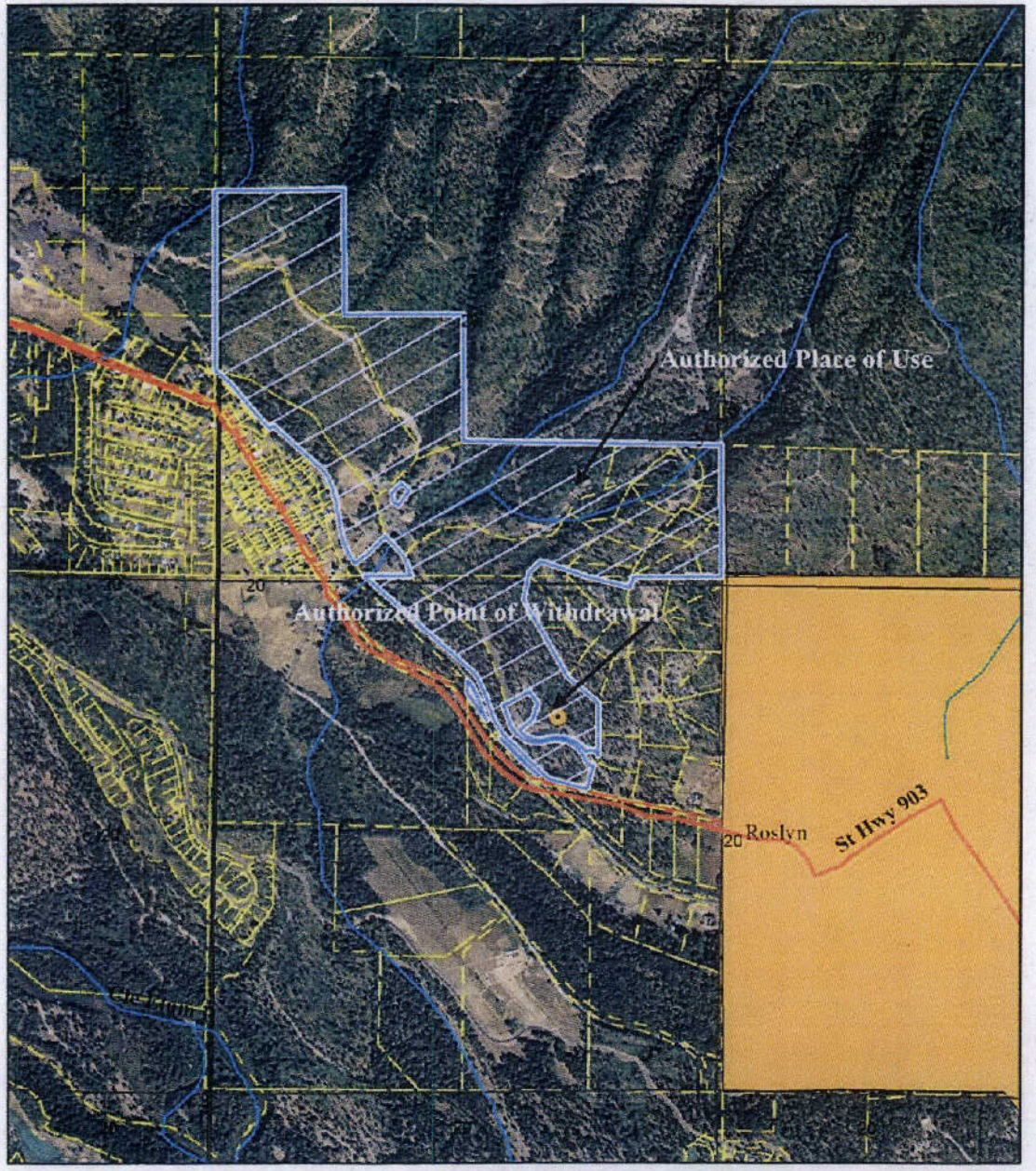

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Basemap - NAIP 2011 Aerial Photo

DEPARTMENT OF ECOLOGY State of Washington

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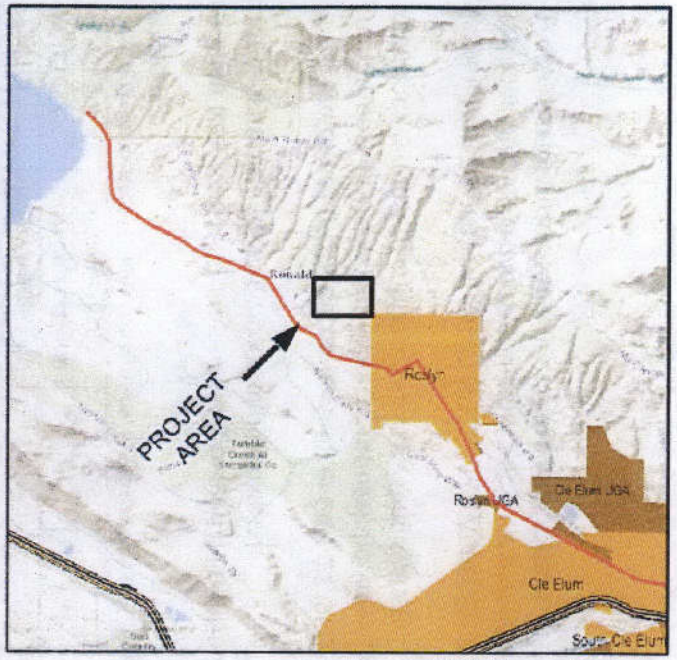
R & R Heights Land Company, Inc.
G4-35604
Secs. 7 &18, T. 20 N., R. 15 E.W.M.
WRIA 39 - Kittitas County



Basemap - ESRI US Topographic Maps

Legend

- Authorized Place of Use
- Authorized Point of Withdrawal
- ECY City
- Townships
- Sections
- Parcels
- ECY WaRivers
- ECY Highways

Comment:

Place of use and source locations are as defined within the Report of Examination cover sheet for the document identified in the header above.

ATTACHMENT 1

Attachment 2

Table 4: Other Rights Appurtenant to POU

Control No.	Doc. Type	Purpose	Qa	Source
S4-84638-J	CFO	SR	166,846	Yakima River
S4-84639-J	CFO	SR	250,261	Kachees River
S4-84640-J	CFO	SR	446,610	Yakima River
S4-84641-J	CFO	SR	38,768	Bumping River
S4-84642-J	CFO	SR	216,850	Tieton River
S4-84643-J	CFO	SR	5,300	Tieton River
S4-84644-J	CFO	SR	472	Yakima River
S4-84645-J	CFO	SR	2	Tieton River
S4-84646-J	CFO	SR	56	Yakima River
S4-84647-J	CFO	SR	60	Yakima River
S4-84648-J	CFO	SR	408	Yakima River
S4-84649-J	CFO	SR	1,265	Tieton River
S4-84650-J	CFO	SR	5,120	Yakima River
S4-30430	New App	MU	110	Domerie Creek
CG3-21798C@1	Change/ROE	MU	169	1 Well
CS4-01724(A)CTCL@1	New Change App	MU	283.92	Yakima, (3) Cle Elum River
CS4-01724(B)CTCL@1	New Change App	MU	88.94	Yakima, (3) Cle Elum River
CS4-01724(C)CTCL@1	New Change App	MU	94.83	Yakima, (3) Cle Elum River
CS4-YRB7CC01724@4	Change/ROE	MU	1,005.98	*6 Wells + Yakima, Cle Elum River
CS4-YRB7CC01724@5	Change/ROE	MU	536.3	*6 Wells + Yakima, Cle Elum River
CS4-YRB7CC01724@6	Change/ROE	MU	929.62	*6 Wells + Yakima, Cle Elum River
CS4-05259CTCL	New Change App	MU	195	Yakima, (3) Cle Elum River
CS4-00908CTCL@1	New Change App	MU	868	Yakima, (3) Cle Elum River
CS4-00262CTCL	New Change App	IR, ST	120	(3) N. Fork Cowiche Creek
CS4-01279CTCL	New Change App	DM	21	1 Well
CS4-01279CTCL@2	New Change App	DS, IR	5	Unnamed Spring
CS4-01279CTCL@3	Change/ROE	IR, ST	6.125	Yakima River (Younger Ditch)

DS=Domestic Single, DM=Domestic Multiple, IR=Irrigation, ST=Stockwater, MU=Municipal, HW=Highway maintenance and construction, SR=Storage

Surface Water Right Nos. S4-84638-J-S4-84650-J, owned by the United States Bureau of Reclamation, authorize water to be stored for flood-control purposes.

A portion of the place-of-use (POU) authorized under CG3-21798C@1 (Evergreen Valley Water System) covers the same proposed POU as this subject proposal; however, Evergreen Valley Water System denied the applicant's request to connect to this existing system.

Change Application Nos. CS4-01724(A)CTCL@1, CS4-01724(B)CTCL@1, and CS4-01724(C)CTCL@1 are applications to change the POU and to add points-of-diversion (POD) for rights already owned by Suncadia. Ecology has not processed any of these applications.

Although Change/ROE Nos. CS4-YRB7CC01724@4, CS4-YRB7CC01724@5, and CS4-YRB7CC01724@6 are for municipal use and cover the same POU as this subject application's proposal, the water rights are intended to service the Suncadia Resort specifically.

CS4-05259CTCL is a change application, which requests a change to municipal and flow augmentation purposes and was filed in 2004. Ecology has not processed the application.

CS4-00908CTCL@1 requests municipal use and was filed in 2004. The application has not been processed.

Submitted in 2004, CS4-00262CTCL requests irrigation and stockwater use from 3 diversions on Cowiche Creek. Ecology has not processed the application.

Change Application No. CS4-01279CTCL was received in 2004 for domestic multiple. Ecology has not processed the application.

Change Application No. CS4-01279CTCL@2 requests use for domestic single and irrigation. Ecology has not processed the application.

Change/ROE No. CS4-01279CTCL@3 authorizes use for stockwater and irrigation of 1 acre.