



State of Washington
DRAFT
REPORT OF EXAMINATION
FOR WATER RIGHT APPLICATION

PRIORITY DATE 6/21/2013	WATER RIGHT NUMBER G2-30621
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MAILING ADDRESS BLUE HORIZON WATER COMPANY P.O. Box 759 Orting, WA 98360	SITE ADDRESS (IF DIFFERENT)
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Quantity Authorized for Withdrawal or Diversion

WITHDRAWAL OR DIVERSION RATE 250	UNITS GPM	ANNUAL QUANTITY (AF/YR) 56.3
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Purpose

PURPOSE	WITHDRAWAL OR DIVERSION RATE			ANNUAL QUANTITY (AF/YR)		PERIOD OF USE (mm/dd)
	ADDITIVE	NON-ADDITIVE	UNITS	ADDITIVE	NON-ADDITIVE	
Multiple Domestic	250		GPM	56.3		01/01 - 12/31

IRRIGATED ACRES		PUBLIC WATER SYSTEM INFORMATION	
ADDITIVE	NON-ADDITIVE	WATER SYSTEM ID	CONNECTIONS
0	0		

Source Location

COUNTY PIERCE	WATERBODY GROUNDWATER	TRIBUTARY TO	WATER RESOURCE INVENTORY AREA 10-PUYALLUP
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SOURCE FACILITY/DEVICE	PARCEL	WELL TAG	TWP	RNG	SEC	QQ Q	LATITUDE	LONGITUDE
Well 1	0418013043	ACV507	18N	04E	12	SW SW	47.069440°	122.250608°
Well 2	0418013043	ACV508	18N	04E	12	SW SW	47.069434°	122.250654°
Well 3	0418013043	ACV501	18N	04E	12	SW SW	47.069247°	122.250597°
Well 4 (proposed)	0418012004	TBD	18N	04E	1	NW SW	TBD	TBD

TBD=To be determined
Datum: NAD83/WGS84

Place of Use (See Attached Map)

LEGAL DESCRIPTION OF AUTHORIZED PLACE OF USE

The place of use (POU) of this water right is the service area described in the most recent Small Water System Management Program approved by the Washington State Department of Health, so long as the water system is and remains in compliance with the criteria in RCW 90.03.386(2). RCW 90.03.386 may have the effect of revising the place of use of this water right.

Proposed Works

Three existing wells (Wells 1 through 3 located on parcel 0418013043) and one new well (Well 4 on parcel 0418012004). The proposed new well is expected to be drilled with 12-inch diameter casing to a depth of approximately 200 feet. The target aquifer zone may be up to 100 feet thick in the local area, but the well is expected to be screened between depths of 100 to 150 feet.

Development Schedule

BEGIN PROJECT	COMPLETE PROJECT	PUT WATER TO FULL USE
January 1, 2015	January 1, 2018	January 1, 2035

Measurement of Water Use

How often must water use be measured?	Monthly
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 or cfs)

Provisions

Wells, Well Logs and Well Construction Standards

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.

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.

Installation and maintenance of an access port as described in WAC 173-160- 291(3) is required.

Measurements, Monitoring, Metering and Reporting

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.

Recorded water use data shall be submitted via the Internet. To set up an Internet reporting account, contact the Southwest Regional Office. If you do not have Internet access, you can still submit hard cop-

ies by contacting the Southwest Regional Office for forms to submit your water use data.

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.

Water Level Measurements

In order to maintain a sustainable supply of water and ensure that your water source is not impaired by future withdrawals, static water levels should 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 must be submitted in digital format and must 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.

Department of Health Requirements

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. Please contact the Office of Drinking Water at Southwest Drinking Water Operations, 243 Israel Road S.E., PO Box 47823, Tumwater, WA 98504-7823, (360) 236-3030.

Water Use Efficiency

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.

Mitigation of Impacts

The applicant has proposed to obtain and fully relinquish four water rights (C-3270-A, C-10051, C-5907-A, and C-10163) in the Puyallup River Valley that will offset the modeled impacts of the proposed new water right allocation. On or before the date of first use of the proposed new well source, the applicant shall show compliance with the proposed mitigation plan (discussed in detail below) by filing the appropriate forms with the Department showing the transfer assignment and relinquishment of each of the rights as shown in table 1 below.

Certificate	Name	Qi	Qa (afy)	Consumptive use offered as mitigation offsets	Relinquishment required by
C-3270-A	E. Koehler	150 gpm	40	33.3	January 1, 2018
C-10051	K. Koehler	0.02 cfs	2.8	1.0	
C-5907-A	J.F. Strubi	300 gpm	60	49.9	
C-10163	J.F. Strubi	0.02 cfs	1.5	0.35	

The total mitigation offset value of the combined rights is 84.5 acre-feet per year. Each of the above rights shall be relinquished on or before the completion of construction date of January 1, 2018. Mr. Koehler's single domestic water use under C-3270-A from the well that serves the residence will revert to a permit-exempt well after the certificate is relinquished.

Proof of Appropriation

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.

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.

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. G2-30621, subject to existing rights and the provisions specified above.

Your Right To Appeal

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

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

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

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

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

Signed at Olympia, Washington, this _____ day of _____ 2014.

Michael J. Gallagher, Section Manager

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

INVESTIGATOR’S REPORT

Application for Water Right – Blue Horizon Water Company

Water Right Control Number G2-30621

Mike Gallagher, Department of Ecology

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BACKGROUND

This report serves as the written findings of fact concerning Water Right Application Number G2-30621.

Cost Reimbursement

This application is being processed under a cost-reimbursement agreement between the applicant and the Department of Ecology. This report has been prepared by Robinson Noble, Inc. under Ecology cost reimbursement contract C1000191. The work assignment for this project was authorized by Ecology on December 16, 2013.

Project Description

The Department of Ecology received the application from Blue Horizon Water Company on June 21, 2013. The application requests 250 gallons per minute (gpm) and approximately 80 acre feet per year (afy) of annual supply from three existing wells and one proposed well located in the Puyallup River Watershed (Figure 1). The application seeks to increase water production for the system by installing a new groundwater well that will supply a proposed 234-home residential development called “Daybreak”. The proposed new well is expected to be drilled with 12-inch diameter casing to a depth of approximately 200 feet. The target aquifer zone may be up to 100 feet thick in the local area, but the well is expected

to be screened between depths of 100 to 150 feet.

Table 1 Summary of Requested Water Right

Applicant Name:	Blue Horizon Water Company
Date of Application:	June 21, 2013
Place of Use	Portions of Township 18 North, Range 04 East Sections 1 and 12 as described in the water system's most recent comprehensive water system plan.

County	Waterbody	Tributary To	WRIA
Pierce	Groundwater	N/A	10 – Puyallup

Purpose	Rate	Unit	afy	Begin Season	End Season
Municipal Supply	250	gpm	80	01/01	12/31

Source Name	Parcel	Well Tag	Twp	Rng	Sec	QQ Q	Latitude	Longitude
Well 1	0418013043	ACV507	18N	04E	1	SW SW	47.069440°	-122.250608°
Well 2	0418013043	ACV508	18N	04E	1	SW SW	47.069434°	-122.250654°
Well 3	0418013043	ACV501	18N	04E	1	SW SW	47.069247°	-122.250597°
Well (proposed)	0418012004	TBD	18N	04E	1	NW SW	TBD	TBD

gpm = gallons per minute; afy = Acre-feet per year; Sec. = Section; QQ Q = Quarter-quarter of a section; WRIA = Water Resource Inventory Area; E.W.M. = East of the Willamette Meridian; Datum: NAD83/WGS84.; TBD= To Be Determined

Legal Requirements for Approval of Appropriation of Water

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 Eatonville Dispatch on August 28, 2013 and September 4, 2013.

Consultation with the Department of Fish and Wildlife

The Department must give notice to the Department of Fish and Wildlife (WDFW) of applications to divert, withdraw or store water.

As part of the Phase I process, Pacific Groundwater Group (PGG) contacted WDFW to discuss the project. According to PGG, WDFW indicated that the late summer is most critical for maintaining baseflows and that mitigation surplus in the summer months provide far more benefit to fish habitat than mitigation deficits cause disruption during the winter and early spring (PGG, 2013).

During the processing of this application, Mr. Steven Boessow of WDFW was contacted via email to request formal comments concerning the withdrawal and proposed mitigation. Mr. Boessow provided a response in a letter to Ecology dated May 21, 2014.

The WDFW commented on the proposed mitigation for the water right, which includes retiring or placing into the Trust Water Rights Program two surface water rights (from springs) and two groundwater rights. They stated that removal of the spring diversions would represent a positive benefit to the reach

(locally called Lawrence Creek) downstream of the confluence of the two tributaries modeled for impacts by PGG (see impairment discussion below). However, they note that removal of the groundwater wells would result in two outcomes, 1) the continuation of domestic use and stock watering on these properties since a permit-exempt well could serve those purposes, and 2) the likelihood that the properties once irrigated by these rights would likely become developed sometime in the future and that housing, roads, and/or businesses on this property would be a potential detriment to water quality in the streams. WDFW notes that, on balance, they are not supportive of the application but will not oppose or appeal it.

Current zoning classifies the properties surrounding these mitigation rights as either Rural Farm or Agricultural Resource Land. If the land is re-zoned by the County, this should provide an opportunity for concerned individuals or stakeholders to comment concerning the water quality concerns for the river and streams. However, WDFW notes that placing use restrictions on the existing properties related to the mitigation rights to prevent or limit future development, would improve the potential benefits of curtailing the water use associated with the properties.

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, 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;
- (b) It is a groundwater right application for more than 2,250 gallons per minute;
- (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, it is categorically exempt from SEPA and a threshold determination is not required.

INVESTIGATION

Project Location

The Blue Horizon water system is located near Graham, Washington in the Puyallup River Watershed in Section 1, Township 18, Range 4 E. W.M., approximately two miles southwest of the Puyallup River (Figure 1).

Other Rights Appurtenant to the Place of Use

The Blue Horizon Water Company maintains three water rights certificates (Table 2) which serve the current community.

Certificate	Priority Date	Source	Primary or non-additive	Qi (gpm)	Qa (afy)
G2-26406	08/22/1983	Wells 1 & 2	Primary	65	38.5
G2-28435	03/23/1992	Well 2	Primary	65	10.5
G2-28436	03/23/1992	Well 3	Non-additive	65	35
Primary Total				130	49

Blue Horizon identified its current wells as withdrawal points for the new water right permit. However, according to the applicant, most if not all of the new production will be associated with the new well to be constructed nearer to the Daybreak project.

Proposed Use and Basis of Water Demand

The Water Company currently serves 402 residents on 134 connections in the Deer Park Mobile Home Park in south-central Pierce County. The development consists mostly of small manufactured homes and is currently approved by the Department of Health (Health) to supply 138 service connections. The system is metered and reports an average use of about 232 gallons per day (gpd) per connection (PGG 2012). According to PGG's Phase 1 report, the system has three wells (Table 3).

Source	Depth (feet)	Drilled	Elevation of top of open interval (feet) ¹	Depth to water at construction (feet)	Rated Capacity (gpm)
Well 1	79	1983	511	33	51
Well 2	145	1991	450	70	70
Well 3	220	1995	372	75	65
Maximum Capacity					186

¹ The surface elevation at the wellfield is estimated at 590 feet.

According to the well logs on file for these wells, only Well 2 is screened. Wells 1 and 3 are both completed with a simple, open-bottom design. The wells are equipped to produce up to 186 gpm. Well 3 is currently used only as a back-up/emergency source due to elevated iron and manganese levels. However, the well is productive and could be used with additional treatment.

Current system capacity would allow for up to 175 connections according to Health source-adequacy calculations, assuming no increase from current water-usage levels (PGG, 2013). However, the existing development is largely built-out and not expected to expand. The development's current water use averages 38 of its allocated 49 afy, leaving 11 afy of inchoate right remaining for future needs.

The new Daybreak project will add an additional 234 homes to the system which will be supplied from the current water system and by the proposed new well, currently expected to be installed about 3,500 feet to the north of the existing wells (Figure 1). PGG (2013) identified a planned water use of 256 gpd per connection for the new development. This gives a total annual water use of 67.22 acre-feet. The application requested 80 afy.

However, the 11 afy of the Company's existing rights that is inchoate could serve up to 38 connections of the new development. Since the application seeks to include all of the Company's existing wells, in addition to the new well, as proposed withdrawal locations, it is reasonable to expect full use of the Company's existing water rights. Applying the existing 11 afy to the new project reduces the total num-

ber of connections to be served by the allocation of new water rights, leaving a new water demand of 56.3 acre-feet (196 remaining connections at 256 gpd).

Site Visit

A site visit was conducted on January 15, 2014, by Robinson Noble Principal Hydrogeologist Burt G. Clothier. We met with Mr. Jack McMahon of Blue Horizon Water Company, the system owner/operator, and Ms. Jill Van Hulle of Pacific Groundwater Group. We visually inspected the wellheads for Wells 1, 2 and 3, the pump house and attendant equipment, and briefly discussed the system's operation to confirm the details of the application. We also accomplished a cursory drive through of the neighborhood to better understand the physical setting and topographic relationships. Mr. McMahon then led a short drive through the Puyallup River Valley area where streams of interest flow along the toe of the valley wall, east of the development location. Additionally, we viewed the farm land and related irrigation source wells and springs related to the mitigation water rights proposal (discussed below).

Geology and Hydrogeologic Setting

The following summary of the hydrogeologic setting is primarily based on the recent U.S. Geological Survey (USGS) study on the Clover-Chambers Creek basin (Savoca and others, 2010) and previous investigations by Robinson Noble completed for Firgrove Mutual Water Company, including the construction report for their Well 19B which is approximately one mile to the northwest of the Blue Horizon Water Company wells. Previous work describing the geology of the area include Walters and Kimmel (1968), Robinson & Noble (1992, revised 2008), Jones (1999), and Borden and Troost (2001). Regional-level studies of the Clover Creek basin (Water Resource Inventory Area 12) were previously undertaken for the Tacoma-Pierce County Health Department in 1985 (Brown and Caldwell) and 2002 (Robinson & Noble). These older efforts have now been partially supplanted by the USGS study as it is broader in context and provides a more comprehensive description of the regional water resources.

The USGS conceptual model describes the hydrogeologic units of the area as being comprised of 11 layers of alternating water-bearing (aquifer) and non-water-bearing (confining layers) sediments. Unlike previous investigations, the USGS layer definition is focused solely on these hydrogeologic properties without regard to geologic origin or age. This means that previous layer designations from earlier studies are not necessarily directly comparable to the current ones (Savoca and others, 2010, Table 1), but even where the names are unchanged, the location and extent of each layer (both vertically and horizontally) are now different.

Descriptions for the each of hydrostratigraphic units defined by the USGS are listed below ("traditional" geologic map unit abbreviations are provided in parenthesis, where applicable):

Aquifer A1 – Primarily consists of stratified silt, sand, and gravel deposits of Vashon recessional outwash (Qvr) of the Frasier glaciation. Locally, this unit includes very coarse outwash gravels of the Steilacoom Gravel (Qvs) at land surface. The unit is typically a few feet up to about 50 feet thick. Where saturated, the unit represents a water-table aquifer and is often in direct continuity with surface water bodies.

Confining unit A2 – This unit is dominated by glacial till deposits of the Vashon glaciation (Qvt), which are often present at land surface when aquifer A1 is not present. Ice-contact and fine-grained glaciolacustrine deposits are also included in this unit. The material is typically low-permeability mixtures of clay, silt, sand and gravel, often compacted and dense. In the local area, the unit averages about 70 feet in thickness, but this can increase to over 100 feet in a few places.

Aquifer A3 – The aquifer below confining unit A2 is mainly composed of deposits from the Vashon advance outwash (Qva). In some areas, older, pre-Fraser coarse grained non-glacial (Qpfc) deposits are also included in this unit. The material is usually well-sorted sand or sand and gravel, sometimes with lenses of silt or clay. Locally, the aquifer appears to be confined by the overlying till.

Confining Unit B – This unit is dominated by deposits of the Olympia Beds (Qob), low-permeability silts and clays from the Olympia-age interglacial period, and glaciolacustrine clays from the early Vashon called the Lawton Clay (Qvlc). Isolated areas of the unit can contain coarser-grained sands that can support limited water production, but these areas are uncommon and discontinuous. The unit is typically more than 50 feet thick in the area and results in strong confinement of the underlying aquifer. Figure 7 of Savoca and others (2010) implies that confining unit B is not present in the area served by Blue Horizon.

Aquifer C – Sometimes also called the sea-level aquifer due its coincident elevation, this system was named the Fredrickson Aquifer in the 1992 Robinson Noble study. The unit is usually sand and gravel deposits of pre-Olympia age glacial drift, but lower-permeability deposits of silt, clay, or till are sometimes encountered. The aquifer is 70 to 150 feet thick in most places in the area. Productive zones within this unit seem to be more discontinuous across the region than is the case with aquifers A3 or E, which means that in some locations while the unit is encountered it does not prove as reliable being able to in support high-capacity wells.

Confining Unit D – Regionally-extensive, this confining unit is made up of non-glacial deposits of alluvial and lacustrine sand, silt, and clay. Laid down during the Puyallup interglacial period, the materials are often distinctively colored, suggesting source material originating from Mount Rainier and vicinity; ash layers are sometimes noted. Where present, these components form important marker beds in the vertical geologic sequence. The non-glacial deposits of this unit occasionally have areas of higher permeability that can yield useable sources of water, but as with confining unit B, they are typically intermittent and discontinuous. The unit is up to 100 feet thick in the local area.

Aquifer E – The third major source aquifer used by purveyors in the region after aquifer A3 (in terms of withdrawal), aquifer E is dominated by glacial drift deposits that appear to correlate with the Stuck Glaciation (Walters and Kimmel, 1968). It mainly consists of deposits of silt, sand, and gravel. The aquifer is typically highly confined and regionally extensive. The unit ranges in thickness from a few tens of feet to over 200 feet.

Confining Unit F – The final confining unit identified by the USGS study, unit F, is primarily silt and clay deposits with discontinuous lenses of sand or sand and gravel. The unit is not well defined as few wells fully penetrate the deposits, but the USGS states it as usually 50 to 200 feet thick. In the local area, the typical depth of this unit approaches the elevation of underlying Tertiary bedrock units, so unit F may thin, pinch out, or possibly be absent.

Aquifer G – The deepest unit defined in the USGS effort is the aquifer underlying confining unit F (aquifer G) and all of the remaining sediments below that aquifer previously identified by the 1985 study by Brown and Caldwell (confining unit H and aquifer I). These units were undifferentiated by the USGS study due to the lack of deep boreholes to define the various layers across the region. While possibly found to the northwest in the Firgrove area, this unit is not expected to be present in the area of the Blue Horizon wells.

Based on the conceptual model presented by Savoca and others (2010) and the Phase I report by PGG (2013), it appears that the Blue Horizon wells produce water from aquifer A3 (Wells 1 and 2) and aquifer C (Well 3). Most local wells are completed at depths equivalent to the projected depth of aquifer A3, but

as noted above, it appears that confining layer B may not be present in the area, which suggests that aquifers A3 and C may have more direct hydraulic connection than would otherwise be the case.

Streams on the upland are expected to be supported by groundwater flows from aquifers A1 and A3, depending on elevation and the presence/absence of confining unit A2. Both aquifers A3 and C are likely to have spring discharges along the bluffs overlooking the Puyallup River valley. The nature and extensiveness of such springs is not well established. Streams on the valley floor are supported by shallow groundwater, upland runoff, and spring flows.

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).

To assess possible impacts from the proposed withdrawal, PGG investigated both the effects of pumping on neighboring wells and on local stream reaches. The Phase I report states near-by wells will not be impaired and provides a water budget analysis of the stream reaches to identify possible new impacts and define a target quantity for the mitigation planning (PGG, 2013). To confirm the impacts on stream reaches developed with the water budget analysis, PGG used the USGS numerical model of the Chambers-Clover Creek watershed (Johnson and others, 2011).

The Blue Horizon wells are not specifically represented in the USGS model but the water system is included based on Department of Health records collected by the USGS. The model assigns water usage rates on a per capita basis at 138 gallons per day (gpd) for each parcel of Group A water systems. On average, this works out to about 38 gpm of continuous production from the existing Blue Horizon system to serve their 402-person population.

With this as a baseline, PGG added an additional withdrawal point to the model that represented the requested use of 80 afy at proposed Well 4 (PGG, 2013). The modeled new well was pumped at 49.6 gpm under steady-state conditions. Water level changes at distance from the new well were assessed to determine if such changes would be likely to cause impacts or impairment of neighboring users. PGG reports a model prediction of 1.6 feet of water level drawdown at a distance of about 1,000 feet and less than 0.5 feet of drawdown at about a mile from the new well. We reviewed the drawdown pattern defined by PGG's model run and compared that to Ecology's database of well logs. Of 181 logs found in the approximate area of the drawdown pattern defined by PGG, only 13 had water levels 20 feet or less

above the screen top or open interval. Of these, nine were shallow wells (60 feet deep or less) and would likely be only indirectly impacted by production from the proposed well. The remaining four logs were investigated and based on their reported locations and well construction; impacts are expected to be minimal. The levels of impact identified by PGG are within the typical seasonal water level fluctuations of the aquifer and are not expected to impair adequately constructed wells.

PGG applied the USGS Chambers-Clover Creek Watershed numerical model (Johnson and others, 2011) to define the impacts of the proposed well on two streams tributary to the Puyallup River as well as six other stream reaches in the watershed. Using the same model runs as above, PGG estimated the water intercepted from the two tributary streams and the main stem of the Puyallup River by the proposed pumping. They then looked at the identified reaches as represented by the model and created a water balance to compare runs with and without the pumping.

Water Availability

For water to be available for appropriation, it must be both physically and legally available.

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 Chapter 90.14 RCW;
- Ground water uses established in accordance with Chapter 90.44 RCW, including those that are exempt from the requirement to obtain a permit; and
- 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.

Both aquifers A3 and C are regarded as regional systems and appear to be present in the area (Savoca and others, 2010). Regionally, wells in these two systems range from 50 to 500 gpm. Aquifer transmissivity values average around 30,000 gallons per day per foot (gpd/ft) in aquifer A3 and about 10,000 gpd/ft in aquifer C. Both aquifer systems are sufficiently prolific where encountered to support withdrawals similar in scale to the Blue Horizon application.

Long-term monitoring of aquifer systems in the area has been conducted by Firgrove Mutual Water Company since 2002. The Mutual's Wells 6, 19a, and 19b are approximately 2 miles west of the Blue Horizon proposed well location and the Mutual's Well 4, 5, and 10 wellfield is about 2 miles northwest. The Mutual has wells completed in both the A3 and C aquifers. The monitoring program was initiated by the Mutual to, in part, determine if aquifer depletion due to over-pumping is occurring. Over the 12-year period of record, the hydrographs created for the Mutual's wells (throughout their whole system) show seasonal water levels fluctuations and responses to pumping, but over-pumping is not occurring (Robinson Noble, 2014).

The wells currently operated by the water company are moderately productive, but based on their construction details (open-bottom construction instead of screened zones) the wells are likely inefficient

producers. A properly-constructed, screened new well should be more efficient and utilize less draw-down per gallon pumped by comparison.

Predictive modeling by the USGS (Johnson and others 2011) to test aquifer sensitivity to additional production (Scenario 2; Figure 16) implies small to moderate changes in aquifer A3 water levels across the Chambers-Clover Creek watershed from an increase of 15% in total water use from all public supply and residential wells in the model. Most impacts were concentrated in the eastern part of the upland. In the southeast model area, near to the Blue Horizon service area, a range of between 0.4 and 3.3 feet of aquifer water level change was modeled. The model scale is too large to identify a specific value for the Blue Horizon wells, but the range provides a sense of scale for regional aquifer sensitivity. Based on water levels elevations in the A3 aquifer, a reduction of less than four feet should not affect availability of water to either Blue Horizon's proposed right or other existing rights.

From this information, we conclude that water is available.

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.

Based on the modeling done by PGG, production from the proposed well source will have impacts to two near-by stream reaches that merge to become a tributary of the Puyallup River. The tributary is locally known as Lawrence Creek and was identified by WDFW as a habitat for fisheries of concern. The modeling assessed 10 model zones representing reaches of various streams and rivers in the model area (including both the Puyallup and Nisqually Rivers) was later refined by PGG to represent the additional use of 56.3 afy from the Blue Horizon system (instead of the original 80 afy applied for). Their results imply an average annual use equivalent to 0.078 cfs, 91% of which would come from groundwater sources that drain to Lawrence Creek or the main stem Puyallup River (two of the ten modeled zones). The remaining 9% of impacts occur in only three of the remaining eight modeled zones on the upland to the west or south of the Company's service area. Each of these three zones had impact values that were less than the expected model error bounds (under 1% of the modeled flow values for that zone) and are therefore considered insignificant.

Since the Puyallup River has periods where its flows do not meet the targets of WAC 173-510 as described by the Phase I report (PGG, 2013), imposing additional impacts to the river's tributaries is not allowed. Without offsetting the identified impacts, the application should be denied. Thus, PGG and the applicant identified four water rights located in the Puyallup River valley and near to the tributaries in

question. The applicant proposes to acquire and fully retire these certificates as a complete mitigation for the implied impacts.

Summary of Mitigation Rights

According to the Phase I report, the applicant has obtained purchase options on two groundwater and two surface water certificates (Table 4). The locations of the four water rights are shown on Figure 2.

Certificate	Name	Priority Date	Source	Use	Qi	Qa (afy)	Control #
C-3270-A	E. Koehler	05/10/1957	Well	Single domestic, Irrigation (20 ac)	150 gpm	40	G2-*04606CWRIS
C-10051	K. Koehler	03/13/1967	Spring	Group domestic Stock water	0.02 cfs	2.8	S2-*20138CWRIS
C-5907-A	J.F. Strubi	02/06/1967	Well	Irrigation (30 ac)	300 gpm	60	G2-*08519CWRIS
C-10163	J.F. Strubi	02/06/1967	Spring	Group domestic Stock water	0.02 cfs	1.5	S2-*20083CWRIS

These water rights were targeted for acquisition based on their location down gradient from Blue Horizon's new well and part of the network of tributaries that supply baseflow to the Lawrence Creek drainage. These rights were selected in consultation with WDFW as being located in an area where additional flow, especially in the summer, could benefit conditions in these small surface water bodies.

While placing these rights into the State's Trust Water Program is one option to offset consumptive use by Blue Horizon, PGG suggests that full relinquishment of these rights would accomplish the same thing and would be easier for all parties than filing formal Trust Water Applications (which require an additional effort on Ecology's part).

The subject springs emerge from the bluff above the Puyallup River and are expressions of the A3 aquifer system that the proposed well is proposed to be completed in. Both springs feed directly to Lawrence Creek. The two wells associated with the mitigation proposal are shallow, tapping groundwater that supplies baseflow to the Puyallup River system. None of these sources are metered. The portion of the spring flows directed toward beneficial use is produced passively by gravity flow. The larger of the two groundwater rights is exercised from the power take-off of a diesel tractor, and water for the other is produced by an unmetered pump. Therefore, if the spring diversions end, flows to Lawrence Creek will be directly increased, and cessation or reduction of use of the groundwater wells will result in a greater groundwater discharge as baseflow to the river system.

Since all of these rights are currently being used, and Blue Horizon is still in the planning phase, the applicant has requested that the relinquishment be timed to correspond with the actual completion of construction date currently scheduled for January 1, 2018.

Groundwater Certificate 3270 was issued to E. Koehler for 150 gpm and 40 acre-feet for 20 acres of irrigation. The point of withdrawal (POW) is located in Government Lot 4 and the place of use (POU) is the west 20 acres of Gov. Lot 4, T. 19 N., R 5.E.W. Section 30. The Koehler well is 93 feet deep, completed in the Puyallup River Valley alluvium, and located 660 feet north and 10 feet east of the SW corner of Section 30.

This property is currently owned by Mr. Karl Koehler, the son of the original water right applicant Eloise Koehler. The Koehler family moved to the Orting area in 1898 and owned and farmed several properties in the Orting valley. Mr. Koehler is 81 years old and has occupied the property for the last 60 years. Mr. Koehler currently uses his well for his domestic supply and also for the seasonal irrigation of a large garden, pasture, and orchard area. While the well will continue to be used to supply the home, Mr. Koehler no longer intends to actively irrigate the grounds.

The water duty for this property has been estimated by using Ecology POL Guidance Document Guide-1210. The Crop Irrigation Requirements (CIR) of 17.62 inches per irrigated acre for pasture land in the Puyallup area is extracted from the Washington Irrigation Guide (Appendix B, 1992). Mr. Koehler uses standard sprinklers, and assuming a standard water use efficiency of 75%, the total Irrigation Requirement for the property is 39.2 afy of which 33.3 afy is consumptive and 5.9 afy is non-consumptive groundwater return flow (PGG, 2013).

Surface water Certificate 10051 was issued to Karl and Mary Koehler for 0.02 cfs and 2.8 afy for stockwater and domestic use from a spring. The point of diversion (POD) is a spring (tributary to Lawrence Creek) located in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 25, T. 19 N., R 4 E.W.M.

The spring designated by this certificate is one of several that have been historically tapped and used by the Koehler family over the last 100 years¹. This spring was well developed at one time and well known to area residents. It historically supplied water to numerous projects including a chicken farm (owned by Harold Lauderback) and numerous homes. The system included a small catchment, storage tanks, and a 1.5 inch line that included multiple "bootleg" taps for domestic supply. Over time, most of the houses using this source drilled wells, found alternate sources, or in several cases, the homes fell into disrepair and became unoccupied.

Today, the distribution line for the spring ends in Mr. Koehler's orchard and is used for some irrigation and also for watering the approximately 20 head of cattle. It is also maintained as an alternate source for the home. Once the right is relinquished, the spring will no longer be used as a water supply source, and there are no plans to continue raising animals commercially on the property. Since the original use of this right has shifted somewhat since it was originally issued, PGG evaluated it based on the current single domestic and stockwater use and assumed it had been legally used for the 0.5 acre of irrigation generally assumed to be associated with single domestic use. Out of the total use of 2.8 afy, PGG estimates that about 1.0 afy is associated with consumptive use (stockwater, irrigation, and domestic) and 1.8 afy is associated with non-consumptive groundwater return flow. The spring collection system is currently in a state of disrepair. Mr. Koehler indicated that while it has been many years since he was able to access the collection system, he believes most water produced at the source flows around the collection system and contributes to general discharge off the hillside.

Groundwater Certificate GWC 5907 was issued to J.F. Strubi for 300 gpm and 60 afy for irrigation of 30 acres from a well. The POW is located in the SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 25, T. 19 N., R 4 E.W.M at a point 660 feet west and 660 feet north from the SE corner of Section 25. The POW is a 92 foot well equipped with 2.5 h.p. Goulds submersible pump.

¹ Mr. Koehler believes that this spring has been in use since 1905

This property is Mr. Strubi's farm, which he has farmed and actively irrigated for 48 years. Mr. Strubi uses currently uses hand lines and operates the well from a power take-off assembly on his diesel tractor. Mr. Strubi grows hay, silage, and also maintains pasture for his cattle.

Based on a CIR of 17.62 inches per irrigated acre, and standard water use efficiencies, the total Irrigation requirement for the property is 58.7 afy of which 49.9 afy is consumptive and 8.8 afy is non-consumptive groundwater return flow.

Surface-water Certificate 10163 was issued to J.F. Strubi for 0.02 cfs and 1.5 afy for stockwater and domestic use from a spring. The POD is located in the SW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 25, T. 19 N., R 4 E. W.M. The place of use is the SE $\frac{1}{4}$ SE $\frac{1}{4}$ - 400 feet east and 50 feet north from the S $\frac{1}{4}$ corner of Section 25, T. 19 N., R 4 E.W.M.

This spring and the property where it is located were purchased several years ago from Mr. Phil Strubi by Mr. Koehler. The spring historically supplied two homes with gardens, but today serves a single mobile home. Out of the total use of 1.5 afy, PGG estimates that about 0.35 afy is associated with consumptive use and 1.15 afy is associated with non-consumptive groundwater return flow. Domestic uses, if continued, will be sourced from existing systems or a permit-exempt source.

To attempt to verify the use of the water rights, County and City GIS database records were accessed. Aerial photographs of the Puyallup valley were reviewed to determine if the rights had been recently exercised. Aerial photos covering the Puyallup valley for the years 1996, 1998, 2002, 2005, 2006 and 2009 were available. Regular farming activities, and presumably irrigation, appear to be taking place on the POU locations identified for the irrigation rights included in the proposed mitigation (Figure 2) throughout the period covered by the photos. Residential homes are also present on each of the relevant properties for the period.

The combination of the aerial photo record and the anecdotal information provided by PGG, implies current and past use of the mitigation rights (at least back to the mid-1990s) but does not provide certainty prior to that time. Neither metering data nor electrical use records are available.

Proposed Mitigation

PGG assessed these proposed mitigation water rights as having a combined allocation total of 468 gpm and 104.3 acre-feet/year with a total consumptive use of 84.5 afy and the remainder as return flow. This consumptive use total represents the mitigation value offered to offset the impacts of the Blue Horizon project as shown in Table 5.

Certificate	Name	Qi	Qa (afy)	Consumptive use offered as mitigation offsets	Relinquishment required by
C-3270-A ¹	E. Koehler	150 gpm	40	33.3	January 1, 2018
C-10051	K. Koehler	0.02 cfs	2.8	1.0	
C-5907-A	J.F. Strubi	300 gpm	60	49.9	
C-10163	J.F. Strubi	0.02 cfs	1.5	0.35	

¹ Mr. Koehler's single domestic water use from the well that serves the residence will revert to a permit-exempt well after the certificate is relinquished.

To compare mitigation total to the predicted impacts from the Blue Horizon new well, PGG assessed a total water indoor use by connection (150 gallons per day), added in an assumed irrigation value (based on a small portion of residential landscaping and lawn for each home). From this, they calculated the total annual water use under the proposed application as 56.3 afy. Not all of this water use will result in potential impacts to the two stream reaches because the drawdown effects in the aquifer are radial and the streams exist only to the north and east of the wells. Their calculation also ignores return-flows from irrigation/outdoor uses (likely minimal) and septic systems (see Tables 6 through 9 of the PGG Phase I for a full list of assumptions and calculated effects). PGG considers the proposed mitigation amount to over-compensate for the actual use and based on analysis during this review, we concur.

The area is just outside of the Pierce County Sewer System service area. The nearest established sewer system infrastructure is nearly a mile away to the northwest at Emerald Ridge High School but the most likely sewer pipeline route (following State Route 161 and 200th Street E) would be a length of over 2.5 miles from the existing line to the Daybreak development. The number of permitted homes and zoning density is based on the unavailability of the sewer services needed in order to allow higher densities. Once the project is completed the larger lot size will likely preclude sewerage as a viable option. These lots have already been tested and deemed acceptable for on-site septic systems – which are appropriate on larger rural lots. Therefore, the area is expected to be served by septic systems for the foreseeable future.

According to PGG, Mr. Koehler is elderly and prepared to stop irrigating and actively farming. They suggested that the Koehler rights will be relinquished prior to permit issuance. Mr. Strubi, however, would like the option of continuing to irrigate for a few more years. Therefore, the applicant is requesting that Mr. Strube's groundwater certificate be formally relinquished once the new well has actually been constructed and water begins to be used. Tying the relinquishment of the Strubi groundwater certificate to the completion of construction date of January 1, 2018 should provide adequate time for Mr. Strubi to continue active farming for a few years.

As noted previously, the source aquifers (A3 and C) for the proposed new well and the current Blue Horizon wells provide part of the baseflow to the nearby streams that become Lawrence Creek (which eventually discharges to the Puyallup River). Since potential impacts to these stream reaches would reduce flows making it to the river and the portions of the creeks along the valley floor are considered habitats of concern, the mitigation plan was targeted on resources that could primarily benefit the creeks where they exist in the valley. Additionally, since mitigation rights include seasonal irrigation components, the cessation of that use will provide a benefit to stream flows during periods of naturally lower flows.

If the applicant acquires the water rights proposed for mitigation and formally relinquishes them, the local benefits to the tributary creeks (assessing the reaches as a whole) will more than fully offset the modeled impacts to the creeks from the installation of the proposed well. Thus, water can be considered legally available.

Beneficial Use

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

Public Interest Considerations

RCW 90.03.290 requires that a proposed appropriation not be detrimental to the public interest.

RCW 90.54 (Water Resources Act of 1971) provides the most comprehensive list of legislative policies that guide the consolidation of public interest in the allocation of water. These policies generally require a balancing of the state's natural resources and values with the state's economic well-being. Specifically, the policies require allocation of water in a manner that preserves instream resources, protects the quality of water, provides adequate and safe supplies of water to serve public need, and makes water available to support the economic well-being of the state and its citizens. This appropriation, if limited to amounts previously established, preserves instream resources in the Puyallup River system and makes water available to serve the public and support the public's economic well-being. Therefore, this proposed appropriation is not detrimental to the public interest.

Consideration of Protests and Comments

No protests were filed against this application.

Conclusions

In accordance with Chapter 90.03 RCW, I conclude that:

- The water is physically and legally available for appropriation,
- The water will serve a beneficial use,
- The diversion will not cause impairment of existing rights, and
- The proposed use 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:

250 gpm

56.3 acre-feet per year

Municipal Supply

Points of Withdrawal

NW¼, SW¼, Section 01, Township 18 North, Range 04 East W.M.

SW¼, SW¼, Section 01, Township 18 North, Range 04 East W.M.

Place of Use

The place of use of this water right is the service area described in the most recent Small Water System Management Program approved by the Washington State Department of Health, so long as the water system is and remains in compliance with the criteria in RCW 90.03.386(2). RCW 90.03.386 may have the effect of revising the place of use of this water right.

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

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