



STATE OF WASHINGTON
FINAL
REPORT OF EXAMINATION
FOR WATER RIGHT APPLICATION

WR Doc ID 5725927

PRIORITY DATE	WATER RIGHT APPLICATION NUMBER
April 26, 2013	G1-28749

NAME AND MAILING ADDRESS	SITE ADDRESS (IF DIFFERENT)
Garden Flowers Zong Cha and Leema Cha 2215 SW 342nd Place Federal Way, WA 98023	See Place of Use description

Total Rate and Quantity Authorized for Withdrawal

WITHDRAWAL RATE (gpm)	ANNUAL QUANTITY (ac-ft/yr)
100	45

gpm = Gallons per Minute; ac-ft/yr = Acre-feet per Year

Purposes

PURPOSE	WITHDRAWAL RATE (gpm)	ANNUAL QUANTITY (ac-ft/yr)	PERIOD OF USE
Irrigation	100	45	Year-round

IRRIGATED ACRES	PUBLIC WATER SYSTEM INFORMATION	
31	WATER SYSTEM NAME and ID	CONNECTIONS
	NA	NA

Source Location

COUNTY	WATERBODY	TRIBUTARY TO	WATER RESOURCE INVENTORY AREA
Snohomish	Groundwater		7- Snohomish

SOURCE NAME	PARCEL	WELL TAG	TOWNSHIP	RANGE	SECTION	QQ Q	LATITUDE	LONGITUDE
Well 1	28052300100900	BNG 696	28N	05E	23	NW NE	47.90617	-122.13028

QQ Q = Quarter Quarter

Datum: NAD83/WGS84

Place of Use

Snohomish County Parcel Nos. 28052300100800, 28052300100900, and 28052300100700

LEGAL DESCRIPTION OF THE AUTHORIZED PLACE OF USE

PARCEL A:

THE NORTH HALF OF THE NORTH HALF OF THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 23, TOWNSHIP 28 NORTH, RANGE 5 EAST W.M.

EXCEPT THE WEST 4.50 FEET THEREOF FOR DITCH PER DEED RECORDED UNDER AUDITOR'S FILE NUMBER 168506.

(ALSO KNOWN AS PARCEL 1 OF BOUNDARY LINE ADJUSTMENT RECORDED UNDER AUDITOR'S FILE NUMBER 200712130410 AND 200712135156)

SITUATE IN THE COUNTY OF SNOHOMISH, STATE OF WASHINGTON.

Abbreviated legal: PORTION NORTHEAST QUARTER 23-28-5

PARCEL B:

THE SOUTH HALF OF THE NORTH HALF OF THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 23, TOWNSHIP 28 NORTH, RANGE 5 EAST W.M.

EXCEPT THE WEST 4.50 FEET THEREOF FOR DITCH PER DEED RECORDED UNDER AUDITOR'S FILE NUMBER 168506.

(ALSO KNOWN AS PARCEL 2 OF BOUNDARY LINE ADJUSTMENT RECORDED UNDER AUDITOR'S FILE NUMBER 200712130410 AND 200712135156)

SITUATE IN THE COUNTY OF SNOHOMISH, STATE OF WASHINGTON.

PARCEL C:

THE NORTH HALF OF THE SOUTH HALF OF THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 23, TOWNSHIP 28 NORTH, RANGE 5 EAST W.M.

TOGETHER WITH THE NORTH 30.00 FEET OF THE SOUTH HALF OF THE SOUTH HALF OF SAID NORTHWEST QUARTER OF THE NORTHEAST QUARTER

EXCEPT THE WEST 4.50 FEET THEREOF FOR DITCH PER DEED RECORDED UNDER AUDITOR'S FILE NUMBER 168506.

(ALSO KNOWN AS PARCEL 3 OF BOUNDARY LINE ADJUSTMENT RECORDED UNDER AUDITOR'S FILE NUMBER 200712130410 AND 200712135156)

SITUATED IN THE COUNTRY OF SNOHOMISH, STATE OF WASHINGTON.

PARCEL D:

A NON-EXCLUSIVE EASEMENT FOR INGRESS AND EGRESS OVER THE WEST 25 FEET OF THE NORTHEAST QUARTER OF SECTION 23, TOWNSHIP 28 NORTH, RANGE 5 EAST W.M.,
EXCEPTING FROM SAID 25 FEET, THE WEST 4.50 FEET THEREOF CONVEYED TO DRAINAGE DISTRICT NO. 1 OF SNOHOMISH COUNTY UNDER AUDITOR'S FILE NO. 168506.

SITUATE IN THE COUNTY OF SNOHOMISH, STATE OF WASHINGTON.

SUBJECT TO: EXCEPTIONS SET FORTH ON ATTACHED EXHIBIT

"A" AND BY THIS REFERENCE MADE A PART HEREOF AS IF FULLY INCORPORATED HEREIN.

Proposed Works

The authorized place of use contains an existing groundwater well, referred to as Well 1, with Ecology Well Tag ID BNG 696. Well 1 has a six-inch diameter and was constructed to a depth of approximately 95 feet below ground surface in April 2022. The proposed water conveyance includes drip irrigation to acreage used for berry and flower production as well as vegetable production. A hand line will be used to support possible future stock (ducks, chickens, goats, and sheep) on the site under the groundwater permit exemption (RCW 90.44.050).

Development Schedule		
BEGIN PROJECT BY THIS DATE	COMPLETE PROJECT BY THIS DATE	PUT WATER TO FULL USE BY THIS DATE
Started	December 31, 2028	December 31, 2030

Attention: These dates represent deadlines that must be met or risk cancellation of this authorization. Submittal of formal documentation for each stage is required. Extensions may be requested.

Measurement of Water Use	
HOW OFTEN MUST WATER USE BE MEASURED AND RECORDED?	Weekly
HOW OFTEN MUST WATER USE DATA BE REPORTED TO ECOLOGY?	Annually by January 31
WHAT QUANTITY SHOULD BE REPORTED?	Total annual quantity in acre-feet
WHAT RATE SHOULD BE REPORTED?	Annual peak rate of withdrawal in gpm

Provisions

Conservation

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.

Family Farm Permit

This authorization to use public waters of the state is classified as Family Farm Permit in accordance with chapter 90.66 RCW. This means the land being irrigated under this authorization shall comply with the following definition: Family Farm - a geographic area including not more than 6,000 acres of irrigated agricultural lands, whether contiguous or noncontiguous, the controlling interest in which is held by a person having a controlling interest in no more than 6,000 acres of irrigated agricultural lands in the state of Washington which are irrigated under water rights acquired after December 8, 1977. Furthermore, the land being irrigated under this authorization must continue to conform to the definition of a family farm.

Measurements, Monitoring, Metering, and Reporting

An approved measuring device must be installed and maintained for each of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use," chapter 173-173 WAC, which describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition the Department of Ecology (Ecology) for modifications to some of the requirements.

Recorded water use data shall be submitted electronically by January 31 each year. To set up an Internet reporting account, contact the Regional Office. If you do not have Internet access, you can still submit hard copies by contacting the Regional Office for forms to submit your water use data.

Proof of Appropriation

Consistent with the development schedule given in this report (unless extended by Ecology), the water right holder must file a Notice of Proof of Appropriation (PA) of Water with Ecology. The PA documents the project is complete and all the water needed has been put to full beneficial use (perfected). In order to verify the extent of water use under this permit, an inspection of water use is typically required, known as a "proof exam." After filing the PA, the water right holder's next step is to hire a Certified Water Rights Examiner (CWRE) to conduct this proof exam. A list of CWREs is provided to the water right holder upon filing the PA with Ecology. The final water right document, a water right certificate, then

may issue based upon the findings of the CWRE. Statutory county and state filing fees may apply prior to certificate issuance.

Authority to Access Project

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.

Senior Water Rights

This authorization to make use of public waters of the state is subject to existing rights, including any tribal water rights held by the United States for the benefit of tribes, to the extent they may exist.

Advisory

Ecology strongly recommends that the water right holder adopt land-use practices that protect stream water quality and reduce nutrient loading. Guidance on agricultural best management practices is available through the Snohomish Conservation District. Ecology is currently developing a Voluntary Clean Water Guidance for Agriculture that describes our recommended best management practices to protect water quality.

Findings of Fact and Order

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

Therefore, I ORDER **APPROVAL** of Application No. G1-28749, 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 to Ecology in paper form - by mail or in person (see addresses below). E-mail is not accepted.

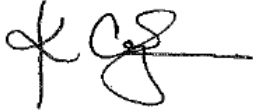
You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

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://www1.leg.wa.gov/CodeReviser>.

Authorizing Signature

Signed at Shoreline, Washington, this 8th day of March, 2023.

A handwritten signature in black ink, appearing to read 'K Cykler', with a horizontal line extending to the right.

Kasey Cykler, Section Manager
Water Resources Program/Northwest Region Office
Department of Ecology

INVESTIGATOR'S REPORT

Water Right Application No.: G1-28749 (Gaosheng Cha)

Investigator: Andrea Lauden and Chelsea Jefferson, LHG

BACKGROUND

This report serves as the written findings of fact concerning Water Right Application Number G1-28749, submitted April 26, 2013, for Gaia's Harmony Farm c/o Gaosheng Cha. The proposed place of use, corresponding to Gaia's Harmony Farm (Farm), is comprised of Snohomish County Parcel Nos. 28052300100800, 28052300100900, and 28052300100700, totaling approximately 31 acres. Current site features at the Farm include approximately 30 acres of barley and hay production as well as one acre of cut flowers and vegetable crops; three greenhouses, two are 95x30 feet and one is 72x30 feet; Well 1; and a small utility shed. Marshland Flood Control District maintains a ditch also known as Thomas Creek along the Farm's western property boundary.

Table 1. Summary of Requested Water Right

Applicant Name	Gaia's Harmony Farm c/o Gaosheng Cha
Priority Date	April 26, 2013
County	Snohomish County
WRIA	7- Snohomish
Water Source	Groundwater from Well 1 (BNG 696)
Place of Use	Snohomish County Parcel Nos. 28052300100800, 28052300100900, and 28052300100700

Purpose	Instantaneous Rate (gpm)	Annual Quantity (ac-ft/yr)	Begin Season	End Season
Irrigation	100	45	01/01	12/31

Source Name	Parcel	Well Tag	Township	Range	Section	QQ Q	Latitude	Longitude
Well 1	28052300100900	BNG 696	28N	05E	23	NW NE	47.90617	-122.13028

WRIA = Water Resource Inventory Area; gpm = Gallons per Minute; ac-ft/yr = Acre-feet per Year; QQ Q = Quarter Quarter

Datum: NAD83/WGS84

INVESTIGATION

On June 22, 2022, Ecology Investigators, Andrea Lauden and Amy Simmons, conducted a site visit at Gaia's Harmony Farm (Farm). During the site visit, Gaosheng Cha (Applicant), accompanied Ecology to all areas of the Farm. Gaosheng Cha provided translation services to property owners, Leema and Zong Cha. During the site visit, photos that depict the Farm were collected and are included here as Appendix A. A general site map of the Farm is included as Attachment 1.

Ecology's site visit and interview with the Applicant and property owners supplemented desktop research performed to investigate Water Right Application Number G1-28749. Desktop research included, but was not necessarily limited to, the following resources:

- Materials submitted by Applicant in support of Water Right Application No. G1-28749
- Applicable laws (i.e. State Water Code), rules, policy, and case law
- Communication with Department of Ecology, Water Quality Program
- Communication with Department of Ecology, Shorelands & Environmental Assistance Program

- Communication with Snohomish Conservation District
- Communication with Snohomish County Planning and Development
- Published studies and professional reports of the Lower Snohomish River and vicinity

Investigative tasks performed are summarized below.

Proposed Use and Basis of Water Demand

Site Description

The following site description is based on desktop research and the site visit conducted on June 22, 2022. During the site visit, Gaosheng Cha (also acting as interpreter for property owners, Leema and Zong Cha) answered questions regarding planned water use on the Farm.

The Farm contains approximately 31 acres of irrigated agriculture located in the alluvial valley of the Lower Snohomish River. Development in the vicinity of the Farm consists mostly of agriculture; however, there is also some undeveloped land, likely due to seasonal flooding. The Farm is located within the administrative boundaries of the Marshland Flood Control District (Marshland District) in Snohomish County. The Marshland District operates a network of irrigation ditches to drain the alluvial valley, between river miles 7 and 15.5, that convey tributary streams and springs from the upland north and west to their pump station on the Lower Snohomish River.

History of Water Use

Currently irrigation water is trucked onto the Farm to support approximately 30 acres of barley or hay production and one acre of flower and vegetable production. Flowers are grown as “cut flowers” for local markets and vegetables may be grown in ground or one of the Farm’s greenhouses. According to the Applicant, the quantity of water trucked onto the Farm is not tracked and therefore cannot be used for a basis of estimating future irrigation water needs.

Proposed Use

Application No. G1-28749 requests an instantaneous rate of 100 gallons per minute (gpm) and an annual volume of 45 acre-feet per year for irrigation of 31 acres. Year-round irrigation was requested to allow for possible use of greenhouses and for flexibility in crop types that have different irrigation needs throughout the year. The Applicant proposes primarily using drip irrigation.

Based on the site visit, Ecology understands that agriculture anticipated on the Farm may include the following berries, flowers, and vegetables.

Berry, flower, and vegetable types, respectively:

- Golden and red raspberry, blackberry, blueberry, and strawberry.
- Dahlia, peony, daffodil, rose, lily of the valley, and lavender.
- Cucumber, tomato, pumpkins, and beans.

Ecology understands that additional quantities of water for stockwatering, specifically to provide drinking water to stock, under the groundwater permit exemption (RCW 90.44.050) are contemplated at the site. Based on information provided by the Applicant, stock that may be supported on the Farm include ducks and chickens (at least 150 of each) for egg production as well as goats and sheep (approximately 30). Use of a handline is anticipated for this purpose.

To determine if the proposed annual volume (45 acre-feet) is reasonable for the proposed use, a theoretical annual volume was calculated based on the regional crop irrigation requirement for blueberries (a high-water-duty crop) using Washington State University’s AgWeatherNet Water Use Model and supplemental documentation from the Natural Resource Conservation Service (NRCS)

Irrigation Guide (NRCS, 1993). The closest AgWeatherNet meteorological station to the proposed place of use is located in Snohomish, Washington, which was used in AgWeatherNet's Water Use Model to calculate the estimated consumptive use per crop.

AgWeatherNet provides an estimate of the consumptive use, equivalent to crop evapotranspiration, using an energy balance model that incorporates a reference evapotranspiration, generally alfalfa, and an empirically derived crop coefficient. The crop irrigation requirement is the irrigation water needed to support the crop during the growing season beyond what is supplied from precipitation. The effective precipitation is the portion of total precipitation that supports crop growth. Below is a generalized equation for the crop irrigation requirement.

$$CIR = ETc - Pe$$

CIR = Crop irrigation requirement

ETc = Crop evapotranspiration or consumptive use

Pe = Effective precipitation

Table 2 below presents estimated monthly consumptive use of blueberries from AgWeatherNet's Water Use Model and effective precipitation from NRCS Irrigation Guide (1993) based on average conditions between years 2008 and 2021 in Snohomish, WA. Ecology understands that no year's weather conditions are average and it is practical to apply a probability of occurrence to the effective precipitation to determine an irrigation requirement sufficient for dryer than average years. Ecology has applied a 90% probability of occurrence to the estimated effective precipitation using methods described in the NRCS Irrigation Guide (1993). Therefore, the estimated crop irrigation requirement provided in Table 2 is expected to be sufficient approximately nine (9) out of 10 years.

Table 2. Crop Irrigation Requirement (Snohomish, WA)

Month ¹	Blueberries ETc ² (in)	Average Precip ³ (in)	Blueberries Pe ⁴ (in)	Blueberries CIR ⁵ (in)
April	2.55	2.57	1.14	1.41
May	4.55	1.9	0.97	3.58
June	4.81	1.56	0.82	3.99
July	5.36	0.51	0.27	5.09
Aug	1.85	0.97	0.44	1.41
Sept	0	2.3	0.00	0.00
Oct	0	3.02	0.00	0.00
Total:	19.12	12.83	3.64	15.48

Notes:

1. The date range of April 1 through October 31 annually is based on AgWeatherNet's default emergence and harvest dates.
2. Estimates of Crop evapotranspiration or consumptive use (ETc) were provided by AgWeatherNet for the Snohomish, WA station. The values in the table are average monthly ETc from crops of interest for 2008-2021.
3. Average monthly precipitation is for AgWeatherNet's Snohomish, WA, meteorological station for the period of record, defined as January 1, 2008 through April 30, 2021.
4. Estimates of effective precipitation (Pe) were calculated using average monthly total precipitation and crop evapotranspiration (ET) Ecology assumed a two-inch soil water storage. A 90% probability of occurrence was then applied.
5. The estimated crop irrigation requirement (CIR) was calculated using Equation 1 above. If estimated effective precipitation (Pe) was greater than the crop evapotranspiration (ETc), the Pe was set to equal ETc. In other words, precipitation was assumed to provide all the water the crop needed, and no additional water (irrigation) is expected. This was the case for average conditions during the months of September and October.

The estimated CIR presented above for blueberries does not account for the efficiency of the irrigation system used. For drip irrigation, estimates for application efficiency range from 70 to 95 percent (Water Resources Program Guidance 1210). The average application efficiency is 82.5 percent, which was used here to estimate the total irrigation requirement, using the following equation:

$$TIR = \frac{CIR}{E}$$

TIR = Total Irrigation Requirement

CIR = Crop Irrigation Requirement

E = Irrigation System Application Efficiency in percent

The following generalized equation is used to calculate annual water use in acre-feet per year (ac-ft/yr):

$$Qa = \frac{TIR}{12 \text{ inches/foot}} \times \text{Irrigated Acres}$$

Qa = Water Right Annual Volume

Irrigated Acres = Acres authorized to be irrigated under this application (46 acres)

Table 3. Estimated Qa (Snohomish, WA)

Crop Type	CIR (in)	Irrigation Efficiency (E)	TIR (in)	TIR (ft)	Acres	Qa (ac-ft/yr)
Blueberries	15.48	82.5%	18.76	1.56	31	48.36

Based on the above calculations, the demand to irrigate blueberries, one of the proposed crop types, on the Farm's 31 acres is about 48 ac-ft/yr. Based on this estimate, Ecology is comfortable with the Applicant's requested 45 acre-feet, understanding that likely some lower-water-duty crops may be irrigated and/or some of the Farm may be used for stock. Ecology understands that, based on the calculations above, an irrigation need for blueberries is expected between April through August, but that the request is for year-round irrigation. Ecology understands that irrigation needs may change based on crop type and use of the Farm's greenhouses; therefore, an estimated annual quantity of 45 acre-feet available year-round will provide the Applicant with some operational flexibility.

The maximum withdrawal rate requested of 100 gpm appears available based on capacity testing performed at 180 gpm, as recorded on the Water Well Report (Appendix B). The annual quantity requested of 45 acre-feet also appears to be available.

Hydrogeologic Evaluation

See Appendix C, Hydrogeological Evaluation of the Lower Snohomish River Valley, by Chelsea Jefferson, LHG.

ANALYSIS

Under Washington State law (RCW 90.03.290), each of the following four criteria must be met for an application for a new water right permit to be approved:

- Water must be available for appropriation.
- Water withdrawal and use must not cause impairment of existing water rights.
- The proposed water use must be beneficial.
- Water use must not be detrimental to the public interest (public welfare).

Water Availability

For any new appropriation, water must be both physically and legally available.

Physical Availability

For water to be physically available for appropriation, water must be present in quantities and quality and on a sufficiently frequent basis to provide a reasonably reliable source for the requested beneficial use or uses. An analysis of physical availability is required for both surface water and groundwater applications.

The proposed quantities of 100 gpm and 45 acre-feet per year are physically available, as demonstrated by the specific capacity test conducted on the Farm's Well 1, following well construction in April 2022 (Appendix B). Well 1 (95-feet deep and 6-inches in diameter) was tested at a rate of 180 gpm for two hours. The drawdown in Well 1, following test completion, was not recorded; however, Ecology understands, from desktop research and familiarity with the area, that a withdrawal rate of 100 gpm and greater is not uncommon in the alluvial aquifer where Well 1 was completed and screened.

The proposed withdrawal rate of 100 gpm has been demonstrated to be physically available by an existing water well located less than 2 miles southeast of the proposed point of withdrawal, in the SW $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 25 of Township 28N, Range 5E W.M., drilled in 1993 under Water Right Permit G1-26406 for Bueler Farms. This well is located 2 miles south and 1 mile west of the Snohomish River and at a point higher in elevation than Well 1. It likely taps the same alluvial aquifer as Well 1. The Bueler well is 82-feet deep, 8-inch in diameter, and has two 5-foot-long screens at depths of 57 and 62 feet in coarse sand and gravel. A 4.5-hour pump test at approximately 300 gpm was conducted in 1993 by Wolfe Mechanical Services, as documented in water right file G1-26406. The driller notes, "the pumping rate of 304.14 gpm at only 2.92 feet of D.D. (drawdown) out of possible 52 feet of available D.D. indicates a possible specific capacity far greater than could be pumped from this diameter well."

Legal Availability

To meet the legal availability test, the proposed appropriation may not withdraw and use water that is already "spoken for," such as water from sources that are protected by administrative rule or court order. This includes tribal water rights held by the United States for the benefit of tribes, to the extent these may exist.

Well 1 withdraws groundwater from an unconfined alluvial aquifer with direct hydraulic connectivity with the Snohomish River, located approximately 0.7 miles to the northeast. Groundwater flow is expected to be generally towards the Snohomish River and in the direction of river flow, generally west and north towards the City of Everett and Commencement Bay. Therefore, any reduction in discharge to the Snohomish River or increase in recharge (from the Snohomish River) to the alluvial aquifer because of the proposed withdrawal is expected to be in the direct vicinity and downstream of Well 1.

This portion of the Snohomish River is downstream of tidal influence, as described in chapter 173-507 WAC, the instream flow rule for the Snohomish River Basin. The rule does not establish an instream flow on the Snohomish River downstream of the “influence of mean annual high tide at low base flow levels” (WAC 173-507-020). See the Impairment section below for more information.

The nearest closed waterbody protected by administrative rule or court order (i.e. no available water for appropriation) is Penny Creek, a tributary stream contributing to Lake Washington in the Cedar-Sammamish River Basin. Streams contributing to the Lake Washington drainage above the Hiram M. Chittenden Locks, excluding the Cedar River drainage, are closed to further consumptive appropriations [WAC 173-508-030(1)]. At its nearest point, this stream is located approximately 3 miles southwest of the proposed point of withdrawal and in the opposite direction of groundwater flow. The hydrogeologic setting suggests that pumping of Well 1 at 100 gpm will not produce impacts at this distance.

Therefore, the proposed appropriation is not expected to withdraw and use water that is legally protected by an instream flow rule or closure, and water is determined to be legally available.

Impairment

In analyzing impairment, Ecology must make a determination as to whether existing water rights, including adopted instream flows, may be impaired by the withdrawal and proposed use.

Senior Appropriations

There are no active groundwater rights or claims with points of withdrawal located within a one-half mile radius. There are also no permit exempt water wells (under RCW 90.44.050) known to be located within a one-half mile radius of the proposed point of withdrawal. With the proposed withdrawal rate of 100 gpm and the hydrogeologic setting described above and in Appendix C, impairment of any senior rights beyond one-half mile from the proposed point of withdrawal is unlikely.

The following conclusion is excerpted from Appendix C, Hydrogeological Evaluation of the Lower Snohomish River Valley:

Considering the site-specific information and proposed withdrawal quantities, groundwater is expected to be available for appropriation without serious injury or impairment to neighboring groundwater water users or downstream surface water users.

Instream Flows

The proposed appropriation, approximately 0.7 miles from the Snohomish River, would be withdrawn from an unconfined alluvial aquifer with direct hydraulic connectivity with the Snohomish River. Groundwater flow is expected to be generally towards the Snohomish River and in the direction of river flow; therefore, any reduction in discharge to the river or increase in recharge (from the Snohomish River) to the alluvial aquifer is expected to be in the direct vicinity (within 0.7 miles), downstream and between the proposed withdrawal and the river.

Chapter 173-507 WAC, the instream flow rule for the Snohomish River Basin, does not establish an instream flow on the Snohomish River downstream of the influence of mean annual high tide at low base flow levels (WAC 173-507-020). Tidal influence is known to exist at USGS Gage 12155500, located at approximately river mile 12.5 in Snohomish, WA. In 2017, Ecology staff investigated the extent of tidal influence and found it to extend approximately to river mile 16.6, which is 3.7 miles southeast (upstream) of this water right application (Application No. G1-28749).

The nearest instream-flow protected stream is Wood Creek, located more than 2.5 miles west-northwest from the proposed point of withdrawal. The radius of influence from pumping of the subject

well is not expected to reach farther than the distance to the river at its nearest location (0.7 miles), therefore Wood Creek will not be impacted.

Considering the hydrogeology of the area and that all instream-flow protected streams are more distant than the anticipated radius of influence, the proposed withdrawal will not impair any senior water rights, including protected instream flows.

Beneficial Use

The proposed appropriation must be for a beneficial use of water. Irrigation is considered a beneficial use of water under RCW 90.54.020(1).

A maximum withdrawal rate of 100 gpm is reasonable for the proposed irrigation method of drip irrigation. The maximum annual quantity of 45 ac-ft/yr is reasonable for the proposed irrigation of 31 acres.

Public Interest

The withdrawal and associated use must not be detrimental to the public interest. At a minimum, the following are considered when making this assessment.

Notification to the Washington Department of Fish and Wildlife

Per RCW 90.03.280 and 77.57.020, Ecology must give notice to the Washington Department of Fish and Wildlife (WDFW) of applications to divert, withdraw, use, or store water. Per RCW 77.57.020, WDFW has 30 days to provide objections to a water right application.

WDFW was provided notice of this water right application on April 15, 2020. As of the date of this report, no response from WDFW has been received.

Notification to the Snoqualmie Indian Tribe and Tulalip Tribes

The Snoqualmie Indian Tribe and Tulalip Tribes have been notified of Ecology's processing of applications in this area, including this application, and will be provided with notification of posting of this Draft Report of Examination.

State Environmental Policy Act (SEPA)

Under chapter 197-11 WAC, a water right application is subject to a SEPA threshold determination (i.e., an evaluation of whether there will be significant adverse environmental impacts) if any of the following conditions are met:

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

Considering that none of the above conditions are met, the application under review is categorically exempt from a SEPA threshold determination.

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 Everett Daily Herald on April 7 and April 14, 2020. No protests to this water right application were received.

Other Public Interest Concerns

In 1999, a total maximum daily load (TMDL) for ammoniacal nitrogen (Ammonia-N), ultimate carbonaceous biochemical oxygen demand (CBOD), and dissolved oxygen (DO) was created for the Snohomish River Estuary. These water quality TMDLs were established using a hydrodynamics and water quality model (WASP5, developed by the EPA) to estimate the total maximum waste load allocation (WLA) for wastewater treatment plants (WWTPs) operating along the lower Snohomish River. The TMDL standards allow a maximum of 0.2 milligrams per liter (mg/L) human-caused reduction in DO concentration in the Snohomish River Estuary per fresh water and marine criteria [WAC 173-201A-200 (1)(d)(i) and 173-201A-210 (1)(d)(i)].

While the TMDL for the Snohomish River Estuary was under development, the Snohomish River Regional Water Authority (RWA) acquired and proposed to change and use Weyerhaeuser Surface Water Certificate #10617 for 56 cfs at Ebey Slough (within the Estuary). According to the Report of Examination for that water right change application, the TMDL model was used to predict under what conditions the 0.2 mg/L reduction in DO could collectively be exceeded by adding the RWA operating at the maximum authorized diversion rate of 56 cfs. Based on the TMDL model's prediction, a technical agreement was reached between Ecology and the RWA to protect water quality with the RWA agreeing to reduce their diversion rate when Snohomish River flows (Monroe gauge) are below 1,350 cfs and during high tide. Additionally, a new water right issued to US Golden Eagle in 2015 for a diversion of 11.14 cfs from the Lower Snohomish River required the Snohomish River diversion to cease when flows at Monroe fell to or below 1,410 cfs.

Impacts of water use on water quality that may be in excess of the fresh water and marine criteria in the Snohomish River Estuary are a public interest concern. However, due to the comparatively small magnitude of water use, water quality impacts caused by individual small- to mid-size water withdrawals/diversions cannot be reliably estimated with currently available tools, including the TMDL model, which was not designed for this type of analysis. Recognizing this, Ecology strongly recommends that water right applicants of this magnitude in the Snohomish River Estuary adopt land-use practices that protect stream water quality and reduce nutrient loading. Guidance on agricultural best management practices (BMPs) is available through the Snohomish Conservation District. Ecology is currently developing a Voluntary Clean Water Guidance for Agriculture that describes our recommended BMPs to protect water quality.

Conclusions

I find that:

- Water is physically and legally available.
- The appropriation will not impair existing rights.
- The proposed irrigation is a beneficial use.
- Approval of this application will not be detrimental to the public interest.

RECOMMENDATIONS

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

Recommended Quantities, Purpose of Use, and Project Location

The rate and quantity of water recommended are maximum limits. The permit holder may only withdraw water at a rate and quantity within the specified limits that are reasonable and beneficial:

Table 4. Recommended Limits and Location

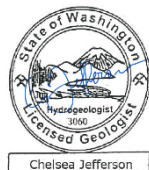
Maximum Instantaneous Rate (gpm)	100
Maximum Annual Quantity (ac-ft/yr)	45
Purpose(s) of Use	Irrigation
Point of Withdrawal	NW ¼, NE ¼, Section 23, Township 28 North, Range 5 E, W.M.
Place of Use	Snohomish County Parcel Nos. 28052300100800, 28052300100900, and 28052300100700



Andrea Lauden, Report Writer

3/1/23

Date



Chelsea Jefferson, LHG

3/1/23

Date

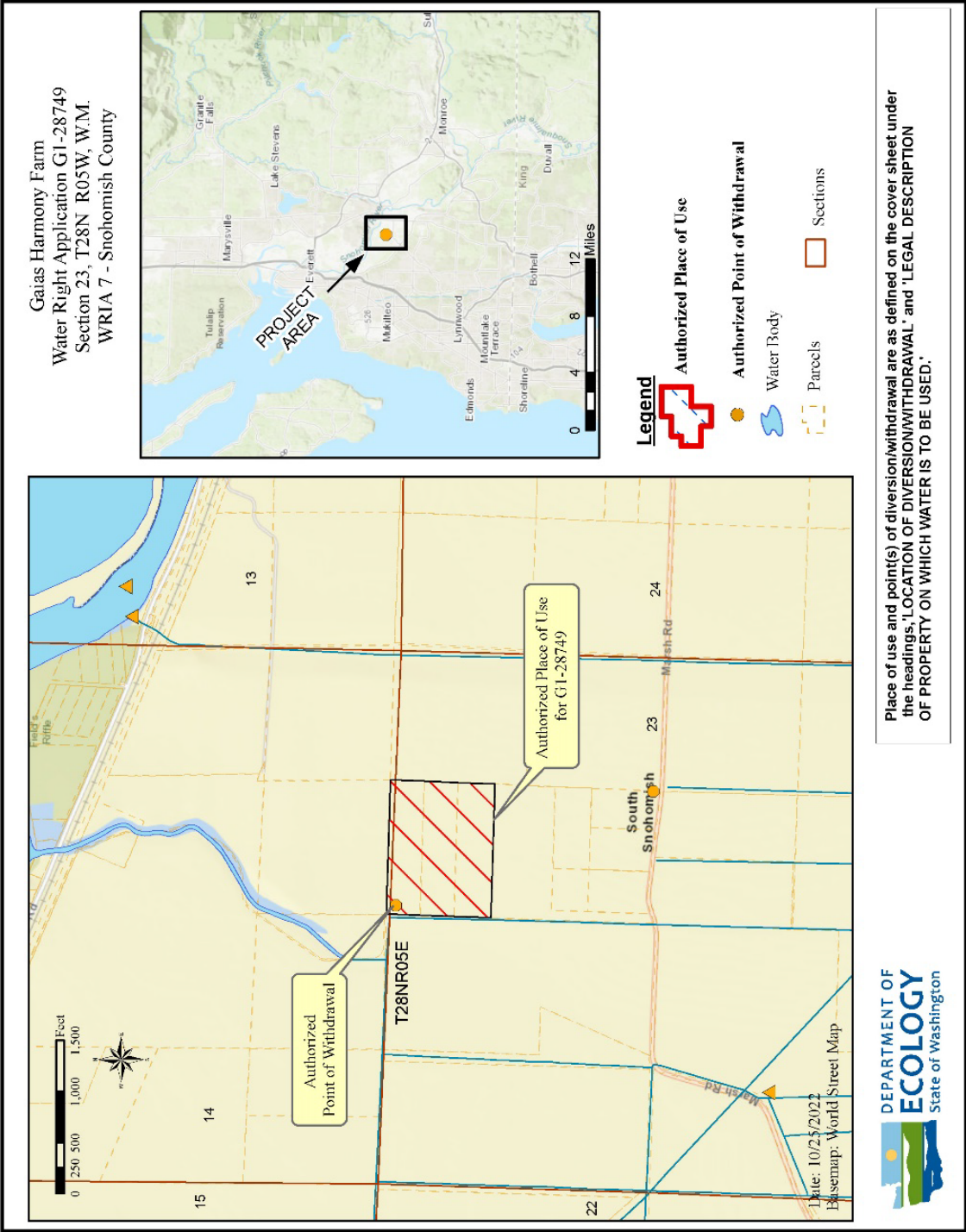
To request ADA accommodation including materials in a format for the visually impaired, call Ecology Water Resources Program at 360-407-6872. Persons with impaired hearing may call Washington Relay Service at 711. Persons with speech disability may call TTY at 877-833-6341.

References

- Butkus, S.R., Cusimano, R.F., Wright, D.E. (1999). *Snohomish River Estuary Total Maximum Daily Load – Submittal Report*. Washington Department of Ecology Publication No. 99-57-WQ Harmsen & Associates (2015). *Marshland Flood Control Dist. Watercourse Type* [map]. 1:36,000.
- Minard, J.P. (1985). *Geologic map of the Everett 7.5-minute Quadrangle, Snohomish County, Washington* [map]. 1:24,000. Miscellaneous Field Studies Map 1748: The Geological Survey.
- Natural Resources Conservation Service. (1993). *Irrigation Water Requirements*. In United States Department of Agriculture, National Engineering Handbook (pp. 142–154).
<https://www.wcc.nrcs.usda.gov/ftpref/wntsc/waterMgt/irrigation/NEH15/ch2.pdf>
- Washington State Department of Ecology Well Report Viewer.
<https://appswr.ecology.wa.gov/wellconstruction/map/WCLSWebMap/default.aspx>
- Washington State University, & Peters, R. T. (n.d.). *Water Use Model. Irrigated Agriculture Research and Extension Center*. Retrieved May 12, 2021, from <https://weather.wsu.edu/?p=97750>
- Water Resources Program. (2020). *Program Guidance: Determining Irrigation Efficiency and Consumptive Use (GUID-1210)*. Washington State Department of Ecology.
<https://apps.ecology.wa.gov/publications/SummaryPages/2011076.html>

Attachment 1 - Map

ATTACHMENT 1



Appendix A – Photo Log



APPENDIX A REPORT OF EXAMINATION GAIA'S HARMONY FARM WATER RIGHT APPLICATION NUMBER: G1-28749



Well head with well tag on right side, looking northwest.



Rows of peonies on the west side of Snohomish County Parcel No. 28052300100900, looking west.

Appendix B - Water Well Report

The Department of Ecology does NOT warranty the Data and/or information on this well report.

WATER WELL REPORT



Type of Work:

☒ Construction
☐ Decommission ☐ Original installation NOI No.

Proposed Use: ☐ Domestic ☐ Industrial ☐ Municipal
☐ Dewatering ☒ Irrigation ☐ Test Well ☐ Other

Construction Type: ☒ New well ☐ Alteration ☐ Driven ☐ Jetted ☐ Cable Tool
☐ Deepening ☐ Other ☐ Dug ☒ Air- ☐ Mud-Rotary

Dimensions: Diameter of boring 6 in., to 95 ft.
 Depth of completed well 95 ft.

Construction Details: Casing Liner Diameter From To Thickness Steel PVC Welded Thread
☒ 6 in. 2' 84.5' 25 in. ☒ ☐ ☐ ☐
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Perforations: ☐ Yes ☒ No Type of perforator used _____
 No. of perforations _____ Size of perforations _____ in. by _____ in.
 Perforated from _____ ft. to _____ ft. below ground surface

Screens: ☒ Yes ☐ No ☒ K-Packer ☐ Depth 82.5 ft.
 Manufacturer's Name Johnson
 Type SS Model No. _____
 Diameter 5 in. Slot size 30 in. from 85 ft. to 90 ft.
 Diameter 5 in. Slot size 20 in. from 90 ft. to 95 ft.

Sand/Filter pack: ☐ Yes ☒ No Size of pack material _____ in.
 Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 20 ft.
 Material used in seal Bentonite Chips 3/8 - 11 Bags
 Did any strata contain unusable water? ☐ Yes ☒ No
 Type of water? _____ Depth of strata _____
 Method of sealing strata off _____

Pump: Manufacturer's Name _____ Type _____
 H.P. _____ Pump intake depth: _____ ft. Designed flow rate: _____ gpm

Water Levels: Land-surface elevation above mean sea level _____ ft.
 Stick-up of top of well casing 2 ft. above ground surface
 Static water level 4 ft. below top of well casing Date 4-21-2022
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (cap, valve, etc.)

Well Tests:
 Was a pumping test performed? ☐ No ☐ Yes ☐ by whom? _____
 Yield _____ gpm with _____ ft. drawdown after _____ hrs.
 Yield _____ gpm with _____ ft. drawdown after _____ hrs.
 Yield _____ gpm with _____ ft. drawdown after _____ hrs.

Recovery data (time = zero when pump is turned off - water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Date of pumping test _____
 Bailer test _____ gpm with _____ ft. drawdown after _____ hrs.
 Air test 180 gpm with stem set at 95 ft. for 2 hrs. Date 4-20-2022
 Artesian flow _____ gpm
 Temperature of water _____ °F Was a chemical analysis made? ☐ Yes ☐ No

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Trainee ☐ PW - Print Name Rodney Gilgath
 Signature _____
 License No. 1473
 IF TRAINEE: Sponsor's License No. _____
 Sponsor's Signature _____

Drilling Company Valley Pump Inc
 Address 202 8th St SE
 City, State, Zip Auburn, WA 98002
 Contractor's
 Registration No. VALLEPI944RQ Date 05/16/22

Notice of Intent No. WE48626
 Unique Ecology Well ID Tag No. BNG-696
 Site Well Name (if more than one well): _____
 Water Right Permit/Certificate No. _____
 Property Owner Name Leema Cha
 Well Street Address 7721 Marsh Rd
 City Snohomish County Snohomish
 Tax Parcel No. 28052300100900
 Was a variance approved for this well? ☐ Yes ☐ No
 If yes, what was the variance for? _____

Location (see instructions on page 2): ☐ WWM or ☒ EWM
 SW 1/4 of the NE 1/4; Section 23 Township 28N Range 5E
 Latitude (Example: 47.12345) 47.906145
 Longitude (Example: -120.12345) -122.130236

Driller's Log/Construction or Decommission Procedure

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each layer penetrated, with at least one entry for each change of information. Use additional sheets if necessary.

Material	From	To
Brown Clay	0	22
Grey Clay	22	50
Coarse Sand & Gravels	50	80
Multi-Gravels	80	95

RECEIVED

By WELL CONSTRUCTION AND LICENSING OFFICE at 4:11 pm, Jun 15, 2022

Start Date 4-19-2022 Completed Date 4-21-22

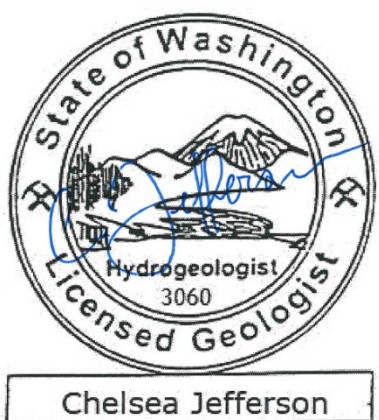
ECY 050-1-20 (Rev 08/19) If you need this document in an alternate format, please call the Water Resources Program at 360-407-6872.
 Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

Appendix C – Hydrogeological Evaluation of the Lower Snohomish River Valley

DEPARTMENT OF ECOLOGY NORTHWEST REGIONAL OFFICE



DATE: July 6, 2020
TO: NWRO Permit Writers
FROM: Chelsea Jefferson, LHG



Chelsea Jefferson, LHG
Hydrogeologist

RE: Hydrogeological Evaluation of the Lower Snohomish River Valley

Overview of Applications

The Washington State Department of Ecology (Ecology), Water Resources Program, is evaluating multiple applications for new water rights in the Lower Snohomish River Valley, located in Snohomish County, Water Resources Inventory Area (WRIA) 7. The water right applications request to use groundwater primarily for irrigation on private-owned farms. See the table below for a description of the water right applications this memo pertains to. This memo reviews the geologic and hydrogeologic framework of the subject area and discusses water availability as well as potential for impairment.

Table 1: Summary of Water Right Applications

Application No.	Applicant Name	Purpose of Use	Acres	Qi (gpm)	Qa (ac-ft/yr)
G1-21568AWRIS	Ed and Edith Stocker	Irrigation	60	300	--
G1-27745	Keith and Janet Stocker	Irrigation	20	23	--
G1-28749	Gaias Harmony Farm	Irrigation, stockwater and single-domestic	31	100	45
G1-28883	Xingfu Farm LLC	Irrigation	15	25	35

Applications G1-21568AWRIS, G1-27745, and G1-28749 are located within the administrative boundary of the Marshland Flood Control District (Marshland District). The Marshland District is located in the Lower Snohomish River Valley, on the south side of the Snohomish River, between river mile 7 and 15.5. The Marshland District is bounded to the west and south by a bluff separating the alluvial valley and upland residences by an elevation of approximately 400 feet. The Marshland District operates a network of irrigation ditches to drain the alluvial valley and convey tributary streams and springs from the upland to their pump station.

Application G1-28883 is located on Ebey Island, within the alluvial valley of the Lower Snohomish River. Ebey Island is bounded to east by Ebey Slough and to the west by the Snohomish River and Steamboat Slough. Ebey Island is mostly developed with irrigated agriculture, however, there are large portions of the Island that remain undeveloped, likely due to flooding. Diking District 1 operates on Ebey Island to drain excess groundwater through a network of ditches. Although “developed” irrigation water from the District is believed to be available to the applicant, due to concerns of availability and water quality, a groundwater source is preferred.

Conceptual Framework of the Lower Snohomish River Valley

Geologic Setting

The Puget Sound lowland is composed predominantly of unconsolidated glacial and interglacial deposits. The most recent period of glaciation occurred approximately 15,000 years ago and is referred to as the Vashon Stade. As the Vashon glacier advanced south, advance outwash deposits of coarse sand and gravel were deposited at the glaciers leading edge. As the glacier continued to advance south, the advance outwash deposits were “capped” by an unsorted mixture of clay, silt, sand and gravel deposited beneath the glacier. This highly compacted deposit is referred to as glacial till. The final glacial deposit is the recessional outwash from meltwater as the Vashon glacier receded north.

During the Holocene Epoch, from approximately 10,000 years ago to present, major rivers, like the Snohomish, have reworked glacial sediments and created new deposits referred to as alluvium. The Lower Snohomish River Valley is mapped as alluvium (Minard, 1985). Alluvial deposits consist of a range of sediment, from clay to gravel, that are locally sorted and stratified. A source review for the Lower Snohomish River Valley indicates that older alluvium has been

identified as laterally extensive terraces beneath younger, generally finer, alluvium that comprise the existing floodplains (Thomas et al., 1997 and Pacific Groundwater Group, 1995).

The alluvial deposits are believed to be, on average, 100 feet thick and are expected to reach a maximum thickness of approximately 200 feet at the mouth of the Snohomish River (Pacific Groundwater Group, 1995). Based on review of water well reports in the area, the upper approximately 60 feet of alluvium appears to be the younger and generally finer deposit. Most wells are completed at a depth of approximately 60 to 100 feet within the older, coarser alluvium. The alluvial deposits are expected to directly overlay pre-Vashon undifferentiated glacial and interglacial deposits. According to Thomas et al. (1997), these pre-Vashon deposits are “transitional beds” of thick, fine-grained sediment deposited in low-energy fluvial environments.

Hydrogeologic Setting

The alluvial aquifer is expected to be laterally extensive, encompassing the Lower Snohomish River Valley, with direct hydraulic connectivity with the Snohomish River. Due to the hydraulic connectivity of the Snohomish River, the alluvial aquifer is expected to discharge to the Snohomish River when flows are low and be recharged by the River when flows are high. Other sources of aquifer recharge are expected to be from the uplands bounding the alluvial valley and precipitation. Based on review of water well reports in the area, depth to groundwater is expected to be 10 feet or less with minor seasonal variation. Groundwater flow is expected to be generally towards the River and in the direction of the River’s flow.

While local conditions may vary somewhat, alluvial aquifers generally are very productive, characterized by often unconfined conditions and high transmissivity, resulting in high capacity wells that generate minimal drawdown. Desktop research of the general productivity of existing wells in the Snohomish River Valley supports this conception. A number of wells were found to produce in excess of 100 gpm.

Groundwater Availability and Potential for Impairment

Washington Administrative Code (WAC) 173-507-020 states that the Snohomish River is regulated upstream of the “influence of mean annual high tide at low base flow levels,” but does not identify the extent of tidal influence. Ecology assumes “mean annual high tide” to be mean high water, which is defined by the National Oceanic and Atmospheric Administration as the mean of all the high waters from the mean of the higher high waters. Low base flow levels in the Snohomish River are generally late August through September.

The extent of tidal influence under these conditions is not well defined, however tidal influence is known to exist at USGS Gage 12155500, located on the Snohomish River at approximately river mile 12.5, at mean high water under low base flow conditions. This USGS Gage is upstream of the water right applications this memo pertains to. Therefore, the water right applications are not subject to minimum instream flows set forth in WAC 173-507.

Based on source information reviewed, including the expected aquifer characteristics, groundwater is physically available from the alluvial aquifer for the proposed withdrawals. Considering site-specific information and proposed withdrawal quantities, groundwater is

expected to be available for appropriation without injury or impairment to neighboring groundwater water users or downstream surface water users.

Limitations

This hydrogeologic analysis has been prepared for groundwater right applications in the Lower Snohomish River Valley, Snohomish County, Washington (WRIA 7) using available information and accepted professional practices of the time. As the practice of geology and hydrogeology are inexact disciplines based on limited information, this evaluation, including any conclusions and interpretations herein of subsurface conditions, are based on both available data and professional judgment. Actual subsurface conditions may differ, sometimes significantly, from those indicated here.

References

- Thomas, B.E., Wilkinson, J.M., and Embrey, S.S., 1997. The Ground-Water System and Groundwater Quality in Western Snohomish County, Washington. U.S. Geological Survey Water Resources Investigation Report 96-4312.
- Minard, J.P., 1985, Geologic map of the Everett 7.5-minute Quadrangle, Snohomish County, Washington: The Geological Survey, Miscellaneous Field Studies Map 1748, scale 1:24,000.
- Pacific Groundwater Group, 1995. Draft Initial Watershed Assessment, Water Resources Inventory Area 7, Snohomish River Watershed. Open-File Technical Report 95-06