WR File NR CG1-23897C@1
WR Doc ID: 4270561

State of Washington
DRAFT
REPORT OF EXAMINATION
FOR WATER RIGHT CHANGE

Added Point of Withdrawal

PRIORITY DATE	WATER RIGHT NUMBER
July 31, 1981	G1-23897C

MAILING ADDRESS	SITE ADDRESS (IF DIFFERENT)
Sammamish Plateau Water & Sewer District 1510 228th Ave. SE Sammamish, WA 98029	23050 Main Street (Well 4R) & 400 228th Ave SE (Wells 11.1 & 11.2) Sammamish, WA 98029

Total Quantity Authorized for Withdrawal or Diversion

WITHDRAWAL RATE	UNITS	ANNUAL QUANTITY (AC-FT/YR)
600	GPM	768

Purpose

PURPOSE	WITHDRAWAL OR DIVERSION RATE			ANNUAL QUANTITY (AF/YR)		PERIOD OF USE (mm/dd)
	ADDITIVE	NON-ADDITIVE	UNITS	ADDITIVE	NON-ADDITIVE	
Municipal Use	600	--	GPM	768	--	continuous

IRRIGATED ACRES		PUBLIC WATER SYSTEM INFORMATION	
ADDITIVE	NON-ADDITIVE	WATER SYSTEM ID	CONNECTIONS
--	--	40900	21,522[1]

1. From WA Dept. of Health database

Source Location

COUNTY	WATERBODY	TRIBUTARY TO	WATER RESOURCE INVENTORY AREA
King	Groundwater	N/A	8: Cedar-Sammamish

SOURCE	PARCEL	WELL TAG	TOWNSHIP	RANGE	SECTION	QQ Q	LATITUDE	LONGITUDE
Well 11.1	3425069069	AAD381	25N	06E	34	NE NW	47.613424	-122.028740
Well 11.2	3425069069	AAD382	25N	06E	34	NE NW	47.61342	-122.0287
Well 4R	1241100011	AAS270	25N	06E	34	NW SW	47.609007	-122.032027

Datum: NAD83/WGS84

Place of Use (See Attached Map)

Service Area for Sammamish Plateau Water & Sewer District

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 Sammamish Plateau Water and Sewer District Comprehensive Plan approved by the Washington Department of Health (Figure 1; Updated 2010). RCW 90.03.386 may allow revisions to the POU of this water right. See Figure 1 for current POU.

Proposed Works

Well 11.1 – The existing point of withdrawal (POW) for this water right. The water right was transferred to this POW following approval of a change application in 2003 (CG1-23897C). The well was completed in 1993 to a depth of 141 feet below mean sea level (ft bmsl) and is screened discontinuously from 59 to 136 ft bmsl. The well is capable of producing approximately 500 gpm.

Well 11.2- The second existing POW for this water right, also included in the 2003 change application (CG1-23897C). The well was completed in 1993 to a depth of 534 ft bmsl and is screened discontinuously from 435 to 530 ft bmsl. The well is capable of producing approximately 2,000 gpm

Well 4R – The additional approved POW for this water right, located approximately 0.3 miles southwest of the existing POWs. The well was completed in 2004 to a depth 504 ft bmsl and is screened discontinuously from 359 to 494 ft bmsl. This well is capable of producing approximately 2,000 gpm.

Development Schedule

BEGIN PROJECT	COMPLETE PROJECT	PUT WATER TO FULL USE
Complete	Complete	In Use

Measurement of Water Use

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

Provisions

Wells, Well Logs and Well Construction Standards

All wells constructed in the state must 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 must be decommissioned.

All wells must 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 must remain attached to the well. If you are required to submit water measuring reports, reference this tag number.

Measurements, Monitoring, Metering and Reporting
Maintenance of an access port as described in WAC 173-160- 291(3) is required. An approved measuring device must be installed and maintained for each of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", WAC 173-173.

Department of Ecology personnel, upon presentation of proper credentials, must have access at reasonable times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

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, pumping must be managed so that static water levels do not progressively decline from year to year. 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 levels must be measured and recorded monthly, using a consistent methodology. Data for the previous year must be submitted by January 31 to the Department of Ecology.

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.

Instream Flow Restrictions
All surface waters in the Lake Washington drainage (Watershed Resource Inventory Area No. 8 [WRIA 8]) are closed to appropriation as defined in WAC 173-508. This rule states that water use within WRIA 8 must not deplete surface water resources for priority dates after September 6, 1979. There is no enlargement of the existing water right (priority date July 31, 1981 and no impacts to streamflow are predicted based on the scope of this examination.

Department of Health Requirements
Prior to any new construction or alterations of a public water supply system, the State Board of Health requires public water supply owners to obtain written approval from the Washington State Department of Health, Office of Drinking Water. Please contact the Office of Drinking Water at Northwest Drinking Water Operations, 20435 72nd Ave S, Suite 200, K17-12, Kent, WA 98032-2358, (253) 396-6750.

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

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

Proof of Appropriation and Issuance of Superseding Certificate
When a change requires significant expense and time to complete, the applicant or Ecology may request a development schedule to ensure diligence in pursuance of the change. Development schedules can also provide a transition from one source to another, or place of use to another over time.

In the present case, the needed infrastructure is in place to affect an immediate change. A transition period is not needed and neither is a development schedule. Therefore, upon final approval of the Report of Examination and after the 30-day appeal period has expired, the Superseding Certificate shall be issued assuming no successful appeal has been filed.

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

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 of use is beneficial; and that there will be no detriment to the public interest.

Therefore, I ORDER approval of Application No. CG1-23897C@1 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 **Pollution Control Hearings Board** 1111 Israel RD SW, Ste 301 Tumwater, WA 98501	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 **Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

Signed at Bellevue, Washington, this _____ day of _____, 2015

_____

Tom Buroker, Section Manager
Water Resources Program/Northwest Region
Department of Ecology

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
Chris Pitre, LHG #1439, Golder Associates Inc.
Andrew Austreng, Golder Associates Inc.
Water Right Control Number CG1-23897C@1
Sammamish Plateau Water & Sewer District

BACKGROUND

This report serves as the written findings of fact concerning Water Right Application Number CG1-23789C@1. The Sammamish Plateau Water and Sewer District (SPWSD) would like to add an additional point of withdrawal (POW) to water right certificate G1-23897C to allow greater flexibility in system operations. SPSWD has experienced historic declines in well production and adding an additional POW to the existing water right allows for system redundancy.

The existing POWs are Wells 11.1 and 11.2 and the requested additional POW is SPWSD's existing Well 4R, which was completed as a replacement to Well 4 in 2004. The new and existing POWs are located approximately 0.3 miles apart, (Figure 1) within the highest pressure zone of the SPWSD distribution system. Wells 11.1 and 11.2 are screened from 409 to 486 and from 785 to 880 feet below ground surface (ft bgs), respectively, in discontinuous intervals and are located approximately 25 feet apart. Well 4R is screened from 709 to 844 ft bgs (discontinuous). Ground surface elevation is approximately 350 ft above mean sea level at all three well locations.

Certificate G1-23897C was issued with a priority date of July 31, 1981 with original POW as Well 6. The Department of Ecology (Ecology) approved a POW transfer to Wells 11.1 and 11.2 (approximately 1.6 miles east of Well 6) for Certificate G1-23897C in 2003 (change application CG1-23897C, submitted January 27, 1995). The water right has been continuously exercised for beneficial use.

EXISTING Water Right Attributes

Water Right Owner:	Sammamish Plateau Water & Sewer District (formerly King County Water District No. 82)
Priority Date:	July 31, 1981
Place of Use	Service area of Sammamish Plateau Water & Sewer District (Figure 1)

County	Waterbody	Tributary To	WRIA
King	Groundwater	N/A	8: Cedar-Sammamish

Purpose	Rate	Unit	Ac-ft/yr	Begin Season	End Season
Municipal Supply	600	GPM	768	continuous	--

Source Name	Parcel	Well Tag	Twp	Rng	Sec	QQ Q	Latitude	Longitude
Well 11.1	3425069069	AAD381	25N	06E	34	NE NW	47.613424	-122.028740
Well 11.2	3425069069	AAD382	25N	06E	34	NE NW	47.61342	-122.0287

Datum: NAD83

Source Limitations

SOURCE	ADDITIVE/ SUPPLEMENTAL	WITHDRAWAL RATE (gpm)	ANNUAL QUANTITY (Ac-ft/yr)	PERIOD OF USE (mm/dd)
Well 11.1	Additive	300	468	Continuous

Well 11.2	Additive	300	300	Continuous

GPM = Gallons per Minute; Ac-ft/yr = Acre-feet per year; Sec. = Section; QQ Q = Quarter-quarter of a section; WRIA = Water Resource Inventory Area,

REQUESTED Water Right Attributes

Applicant Name:	**Sammamish Plateau Water & Sewer District**
Date of Application:	April 25, 2006
Place of Use	Service area of Sammamish Plateau Water and Sewer District

County	Waterbody	Tributary To	WRIA
King	Groundwater	N/A	8: Cedar-Sammamish

Purpose	Rate	Unit	Ac-ft/yr	Begin Season	End Season
Municipal Supply	600	GPM	768	continuous	--

Source Name	Parcel	Well Tag	Twp	Rng	Sec	QQ Q	Latitude	Longitude
Well 11.1	3425069069	AAD381	25N	06E	34	NE NW	47.613424	-122.028740
Well 11.2	3425069069	AAD382	25N	06E	34	NE NW	47.61342	-122.0287
Well 4R	1241100011	AAS270	25N	06E	34	NW SW	47.609007	-122.032027

Datum: NAD83

GPM = Gallons per Minute; Ac-ft/yr = Acre-feet per year; Sec. = Section; QQ Q = Quarter-quarter of a section; WRIA = Water Resource Inventory Area

Cost Reimbursement

This application is being processed under a cost reimbursement agreement between the applicant the Department of Ecology. This report has been prepared by Golder Associates Inc.

Legal Requirements for Requested Change

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 *King County Journal* on June 15, 2006 and June 22, 2006. No protests were filed following publication.

Consultation with the Department of Fish and Wildlife

The Department must give notice to the Washington Department of Fish and Wildlife (WDFW) of applications to divert, withdraw, or store water. Steve Boessow of WDFW was informed of the details of Water Right Application CG1-23897C@1 on April 29, 2015. No comment was received concerning the application.

State Environmental Policy Act (SEPA)

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

- It is a surface water right application for more than 1 cubic foot per second, unless that project is for agricultural irrigation, in which case the threshold is increased to 50 cubic feet per second, so long as that irrigation project will not receive public subsidies;

- It is a groundwater right application for more than 2,250 gallons per minute;
- It is an application that, in combination with other water right applications for the same project, collectively 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.

This application does not meet any of the above criteria and is therefore exempt from SEPA and a threshold determination is not required.

Water Resources Statutes and Case Law

RCW 90.03.380(1) states that a water right that has been put to beneficial use may be changed. The point of diversion, place of use, and purpose of use may be changed if it would not result in harm or injury to other water rights. The Washington Supreme Court has held that Ecology, when processing an application for change to a water right, is required to make a tentative determination of extent and validity of the claim or right. This is necessary to establish whether the claim or right is eligible for change. *R.D. Merrill v. PCHB* and *Okanogan Wilderness League v. Town of Twisp.*

RCW 90.03.386(3) requires a municipal water supplier to apply cost-effective water conservation measures as part of its water system planning. The water supplier must also evaluate the effects of delaying the use of inchoate water rights before it may increase use of those inchoate rights. RCW 90.03.320 requires Ecology to consider the public water supplier's use of conserved water when establishing a surface or ground water right construction schedule. The SPWSD has an effective conservation plan documented in their Water System Plan (WSP; SPWSD 2011). Water use per water connection was reduced by 7.3% between 2001 and 2008.

RCW 90.44.100 allows Ecology to amend a ground water permit to: (1) allow the user to construct a replacement or additional well at a new location outside of the location of the original well, or to (2) change the manner or place of use of the water, if:

- The additional or replacement well taps the same body of public ground water as the original well. RCW 90.44.100(2)(a),
- Where a replacement well is approved, the user must discontinue use of the original well and properly decommission the original well. RCW 90.44.100(2)(b),
- Where an additional well is constructed, the user may continue to use the original well, but the combined total withdrawal from all wells shall not enlarge the right conveyed by the original permit or certificate. RCW 90.44.100(2)(c),
- Other existing rights shall not be impaired. RCW 90.44.100(2)(d).

When changing or adding points of withdrawal to groundwater rights (RCW 90.44.100), or when consolidating exempt wells with an existing permit or certificate (RCW 90.44.105), the wells must draw from the *same body of public groundwater*. Indicators that wells tap the *same body of public groundwater* include:

(a) Hydraulic connectivity.
(b) Common recharge (catchment) area.

(c) Common flow regime.
(d) Geologic materials that allow for storage and flow, with recognizable boundaries or effective barriers to flow.

INVESTIGATION

A site visit was conducted on May 5, 2015 by Chris Pitre and Andrew Austreng of Golder Associates Inc., with Dalton Langlois of SPWSD. The purpose of the visit was to confirm operation of the existing and proposed POWs in accordance with the provisions of the requested water right change. Well 4R (requested additional POW) was equipped with a line shaft pump operated with a variable frequency drive (VFD); the capacity of the pump was rated at 1,650 gpm. Wells 11.1 and 11.2 are located in the same wellhouse and were equipped with a submersible and vertical line shaft pump, respectively, which were operated with VFDs. Pump capacities were in excess of 500 gpm and 1,500 gpm for wells 11.1 and 11.2, respectively. Adequate flow and water level monitoring equipment was in place and operational for reporting purposes.

The hydrogeologic framework used to identify and characterize effects of the requested change was developed from past studies. These studies include hydrogeologic characterizations completed by the applicant's consultant (CDM 2004) and by the US Geological Survey (USGS, 1995). Results from aquifer testing and numerical modeling were reviewed to further quantify any potential impairment to other users.

The most recent Water System Plan for SPWSD (adopted September 2011; SPWSD 2010) was reviewed to determine system operations under the proposed change.

History of Water Use

Certificate G1-23897C was issued with a priority date of July 31, 1981 with Well 6 as the Point of Withdrawal (POW). Well 6 was originally completed to a depth of 363 feet in 1980 and subsequently deepened to 1,000 feet in the 1990s; the well was taken out of service in 2003 due to water quality issues.

The POW for Certificate G1-23897C was changed to Well 11.1 and 11.2 in 2003 (application date of January 27, 1995). The water right has been exercised by SPWSD consistently since the original priority date. RCW 90.03.330 states that a water right represented by a water right certificate issued prior to September 9, 2003, for municipal water supply purposes as defined in RCW 90.03.015 where the certificate was issued based on an administrative policy for issuing such certificates once works for diverting or withdrawing and distributing water for municipal supply purposes were constructed rather than after the water had been placed to actual beneficial use, is a right in good standing.

Well 4R was brought online in 2004 and has been pumped regularly at rates of up to 750 gpm under water rights G1-23022 and G1-*10373CWRIS. No adverse impacts to the aquifer have been identified during approximately 10 years of operation of the well (e.g. water quality, declining water levels).

Other Rights Appurtenant to the Place of Use

SPWSD holds water rights listed in Table 1 plus those associated with an ongoing Aquifer Storage and Recovery Program, with place of use designated as the SPSWD service area (currently about 29 square miles). A total Qi and Qa of 10,613 gallons per minute (gpm) and 7,635 acre-feet per year (af/y), respectively, is permitted for withdrawal within the Plateau Zone (Wells 1R, 2.1, 2.2, 4R, 7, 8, 9, 10, 11.1, and 11.2), where wells are separated by a distance of up to approximately 5 miles (i.e., Well 11.1 and Well 9).

Table 1: SPWSD Water Rights (including pending requested changes in bold; excluding ASR water rights)

Well No	Control No	Certificate	Priority Date	Qi_A	Qa_A	Qi_N	Qa_N
Well 1R	G1-00342C		7/7/1954	300	448		
Well 1R	G1-25438P		5/10/1989	200			448
Well 2 + 2R	G1-*09533C	6802	6/21/1968	500	800		
Well 2 + 2R	G1-00749P		5/12/1971	20	10.5		
Well 4R	G1-*10373C	7147	8/25/1969	200	224		
Well 4R	G1-23022C		12/9/1977	550			880
Well 7/8	G1-00289C		1/20/1972	3,200	936		
Well 7/8	G1-25428P[†]		4/24/1989	2,300	1,288		
Well 9	G1-26014P[†]		12/24/1990			2,000	1,608
Well 11.1 + 4R	**G1-*07653C**	**6395**	**6/4/1965**	**100**	**160**		
Well 11.1 + 11.2 + 4R	**G1-23897C[‡]**		**7/31/1981**	**600**	**768**		
Well 11.2	G1-22861C		5/2/1977	1,000	1,600		
Well 11.2	G1-26572P[1]		4/30/1992	580	568.45		
Well 10	G1-*06228C	5140	3/23/1962	100	22.5		
Well 10	G1-27166P		6/4/1993	500	378.5		186.5
Well 12R	G1-00027C		6/19/1970	100	108		
Well 12R	G1-24363C		7/25/1983	100	12		
Well 13R	G1-25963C		11/7/1990	200	224		
Well 14	G1-25831AC		6/26/1990	62.5	86.68		
			Totals	**10,613**	**7,635**	**2,000**	**3,123**

Qi = Instantaneous Quantity (Pumping Rate) in gpm; Qa = Annual Quantity in afy; Qa_A = Additive Qa; Qa_N = Non-additive Qa; [†] = Winter Only; [‡] Application being concurrently processed with CG1-*07653@1.

The terms "additive" and "non-additive" are used in the following context in reference to water rights:

Additive: A water right for either annual or instantaneous quantities of water that are added to existing water rights.

For example: A well (Water Right G2-11111) is reconstructed and a larger pump installed to allow a water system to meet fire flow needs and accommodate additional homes. A second water right (G2-22222) is issued for additional Qa and Qi from the well, which is additive to G2-11111.

Non-additive: A water right for either annual or instantaneous quantities of water that does not increase the water available in existing water rights.

For example: In the "alternate" example above, Water Right G2-44444 was issued for additive instantaneous quantity, and non-additive annual quantity.

Well 4R is currently the authorized point of withdrawal for G1-*10373C and G1-23022C for a maximum Qi and Qa of 750 gpm and 1,104 af/yr, respectively (Table 1). Application CG1-*07653@1 was submitted at approximately the same time as the current application to add Well 4R as an additional POW to Certificate 6395-A. Approval of both applications would allow total maximum Qi and Qa of up to 1,450 gpm and 2,032 af/yr, respectively from Well 4R; however the maximum annual withdrawal would not likely be met from sole utilization of well 4R, but would be the sum of withdrawals from multiple POWs (i.e., Wells 11.1, 11.2, and 4R).

There are six claims to vested water rights within a half-mile radius of well 4R (Table 2) listed in Ecology's database. Three claims were filed as short form claims, which are generally considered to be valid for less than 5,000 gallons per day (gpd), similar to exempt wells. The remaining three claims were for 1 af/y (G1-131083CL) and 48 af/y for irrigation (G1-070359CL and G1-066990CL). Claim G1-066990CL is the only significant claim with a date of first use reported as predating 1945. In addition, the locations of the wells listed for these claims are within SPWSD's urbanized service area and may no longer be in use.

Table 2: Other Active Groundwater Rights near the Proposed New Point of Withdrawal

Record No.	Name	Priority Date	Record Type
G1-140059CL	Morris F. Shepherd	6/26/1974	Claim S
G1-131083CL	Roland E. Van Camp	10/1/1963	Claim L
G1-122890CL	Richard E. Exendine	6/3/1974	Claim S
G1-105152CL	Maureen Pemberton	6/16/1974	Claim S
G1-070359CL	John D. Schampera	1/1/1965	Claim L
G1-066990CL	Bolivin P. Marshall	8/1/1942	Claim L

Water rights listed in Ecology database as "active" within 1/2 mile of Well 4R, excluding those held by SPWSD.

SPWSD operates the only known group A or group B public water system within a half-mile radius of the proposed additional POW (Well 4R). Wells 11.1 (existing POW) and 11.2 are located approximately 0.3 miles from well 4R and are active sources used by SPWSD.

Hydrologic/Hydrogeologic Evaluation

The hydrogeology of the Sammamish Plateau aquifer system has been investigated in detail by the applicant's consultant (CDM 2004) and by the US Geological Survey (USGS, 1995). Investigations indicate four primary aquifer layers with varying degrees of confinement and vertical hydraulic continuity. Lateral groundwater flow patterns vary between aquifer layers but ultimately discharge to Lake Sammamish and the Sammamish River; vertical flow patterns are generally downward and through variably leaky confining layers. Recharge occurs along the bedrock ramp extending north from the Grand

Ridge and in the central part of the plateau for all parts of the aquifer system, with higher recharge rates where Vashon Stade glacial till (Qvt) is absent.

The primary aquifer layers contributing to stream baseflow and discharge to Lake Sammamish and the Sammamish River are the two uppermost aquifer layers, consisting of alluvium and Vashon stade glacial outwash (Qal/Qvr and Qva, in descending order); these are also the primary aquifers accessed by other users. Well 11.1 is completed in the third deepest aquifer layer which consists of pre-Vashon interglacial sand (Q(A)c). Well 11.2 and the requested additional POW (Well 4R) are completed in the deepest of four aquifer layers, characterized by older glacial and interglacial sand and gravel deposits (Q(B)c).

Numerous surface waters derive a majority of baseflow from the Sammamish Plateau aquifer system, including nearby Elbright, George Davis, and Pine Lake Creeks and the larger Evans and Patterson Creeks along the northern plateau margins. These streams primarily represent aquifer daylighting and perennial springflow in the upper plateau aquifer system and are in less hydraulic continuity with deeper portions of the aquifer (where the proposed POW is completed). The impact of groundwater withdrawals on these surface waters is therefore lessened at greater depths within the aquifer system.

Baseflows in the North Fork of Issaquah Creek are supported primarily by shallow groundwater flowing north atop an uplifted andesite fault block known as the Grand Ridge; this formation is located south of the North Fork of Issaquah Creek and the Sammamish Plateau (i.e., up-gradient from the proposed POWs) and is not known to receive significant groundwater from the aquifer influenced by the proposed or existing POWs. Since the requested POW is down-gradient from the North Fork of Issaquah Creek, no significant impacts to baseflow are expected.

Impairment Considerations

Impairment of Minimum Instream Flow Water Rights

The term "instream flow" is defined as the stream flows needed to protect and preserve instream resources and values, such as fish, wildlife and recreation. Once established, a minimum flow constitutes an appropriation with a priority date as of the effective date of the rule establishing the minimum flow (RCW 90.03.345). Thus, a minimum flow set by rule is an existing right which may not be impaired (RCW 90.03.345; RCW 90.44.030).

All surface waters in the Lake Washington drainage (Watershed Resource Inventory Area No. 8 [WRIA 8]) are closed to appropriation as defined in WAC 173-508. This rule states that water use within WRIA 8 must not deplete surface water resources for priority dates after September 6, 1979. The request is for adding a POW with no change in Qi or Qa, so there will be no impairment due to enlargement. Based on the limits of the hydrogeologic characterizations completed to date, there is no evidence that the requested change would impair surface waters. Numerical modeling (CDM, 2004) indicates that withdrawing water from deeper in the aquifer system under the requested change (i.e. utilization of Well 4R in preference to Well 11.1) will decrease the likelihood of any impacts to surface waters.

Impairment, Qualifying Ground Water Withdrawal Facilities, and Well Interference

There are three concepts that are important when considering whether a withdrawal of water from a well would impair another existing water right. The concepts are defined as follows:

1. Impairment is an adverse impact on the physical availability of water for a beneficial use that is entitled to protection (i.e., water rights that are both senior and junior in priority to the right the applicant seeks to change).

   Application CG1-23897C@1 does not request an increase in rate or quantity of water withdrawn, so no impairments are considered related to enlargement of the water right. The addition of Well 4R as POW to Certificate G1-23897C serves to increase the Qi/Qa of Well 4R (which has existing water rights; Table 1) by shifting some withdrawal from the existing POW (Wells 11.1 and 11.2). There are few users of the deeper Q(B)c part of the aquifer system (requested POW) compared to the shallower Q(A)c (existing POW, Well 11.1); the requested change is therefore likely to lessen impacts to other local users by shifting some withdrawal to the to the Q(B)c portion of the aquifer system.

   Surface waters are not considered likely to be impaired under the proposed change. The request is to add a POW in the deeper part of the aquifer system which has been identified to have lesser hydraulic continuity with surface waters compared to the existing POW. Numerical modeling completed by the applicant's consultant (CDM, 2004) indicates that the Q(A)c part of the aquifer (existing POW) exhibits significant discharge to Lake Sammamish, whereas the proposed POW is completed in Q(B)c which exhibits more regional flow with less impacts to Lake Sammamish.

   Wells 11.1, 11.2, and 4R have been operated regularly at rates of up to approximately 600, 1,600, and 750 gpm, respectively, without any notable adverse impacts on the hydrologic system; Well 5 was also operated in proximity to these wells at rates exceeding 400 gpm, prior to decommissioning. There is no evidence of declining water levels during long-term operation of these wells so recharge rates are likely to remain sufficient to preclude aquifer mining.

   Based on the foregoing discussion, no impairment from the requested change application for CG1-*07653C@1 of other water rights is expected.

2. Qualifying ground water withdrawal facilities are defined as those wells which in the opinion of the Department are adequately constructed. An adequately constructed well is one that (a) is constructed in compliance with well construction requirements; (b) fully penetrates the saturated thickness of an aquifer or withdraws water from a reasonable and feasible pumping lift (WAC 173-150); (c) the withdrawal facilities must be able to accommodate a reasonable variation in seasonal pumping water levels; and (d) the withdrawal facilities including pumping facilities must be properly sized to the ability of the aquifer to produce water.

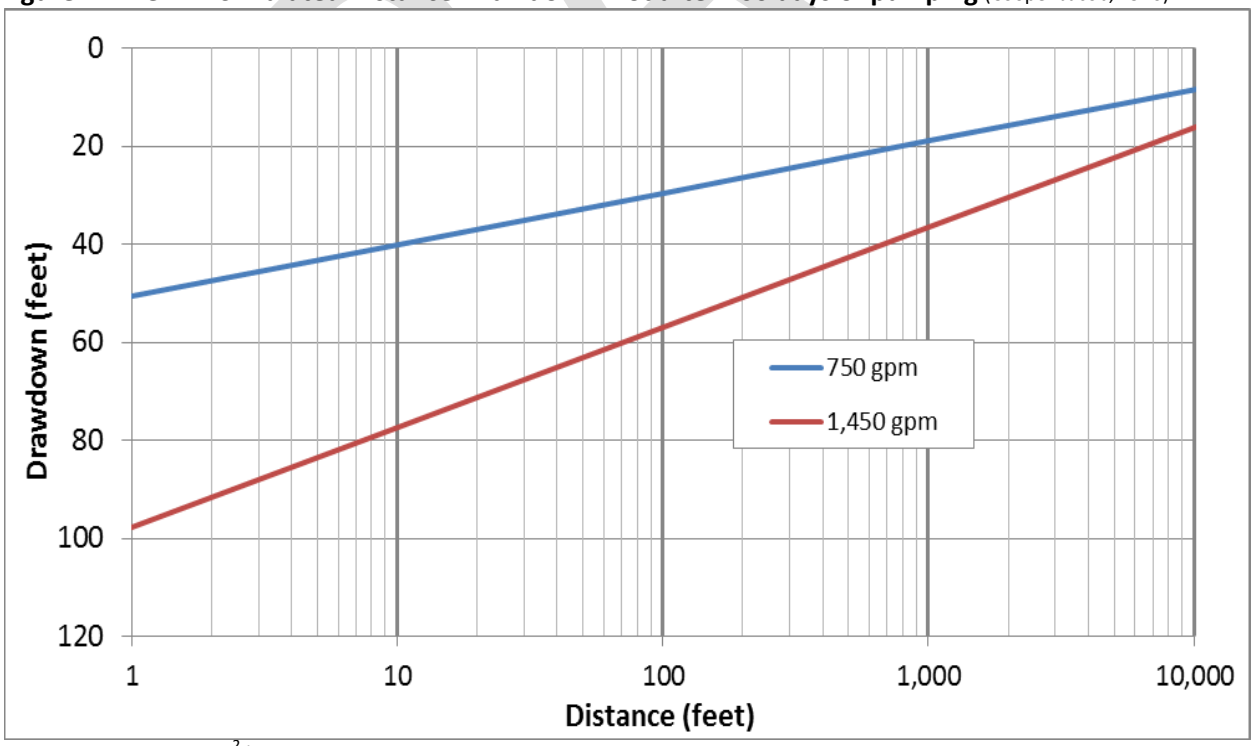
   The requested POW is existing Well 4R (Ecology ID AAS-270). The well was completed in 2004 by Schneider Equipment, Inc., a licensed well driller in the state of Washington. The well has been tested for pumping rates up to 2,000 gpm and exhibited 75 feet of drawdown after 7 hours. The static water level is approximately 220 ft bgs with annual fluctuations on the order of 20 feet, based on results from well testing and water level monitoring completed by SPWSD.

   Based on the foregoing discussion, the additional POW requested in the change application for CG1-23897C@1 is considered a qualifying groundwater withdrawal facility.

3. Well interference may occur when several wells penetrate and withdraw ground water from the same aquifer. Each pumping well creates a drawdown cone. When several wells pump from the same aquifer, well density, aquifer characteristics, and pumping demand may result in individual drawdown cones that intersect and form a composite drawdown cone. At any point in an aquifer, the composite drawdown caused by pumping wells is influenced by the transmissivity (T) of the aquifer. In aquifers with high T, composite drawdown will generally be less than in aquifers with similar properties but with low T. Transmissivity is related to hydraulic conductivity (K) and the saturated thickness (b) of an aquifer by the relationship T=Kb.

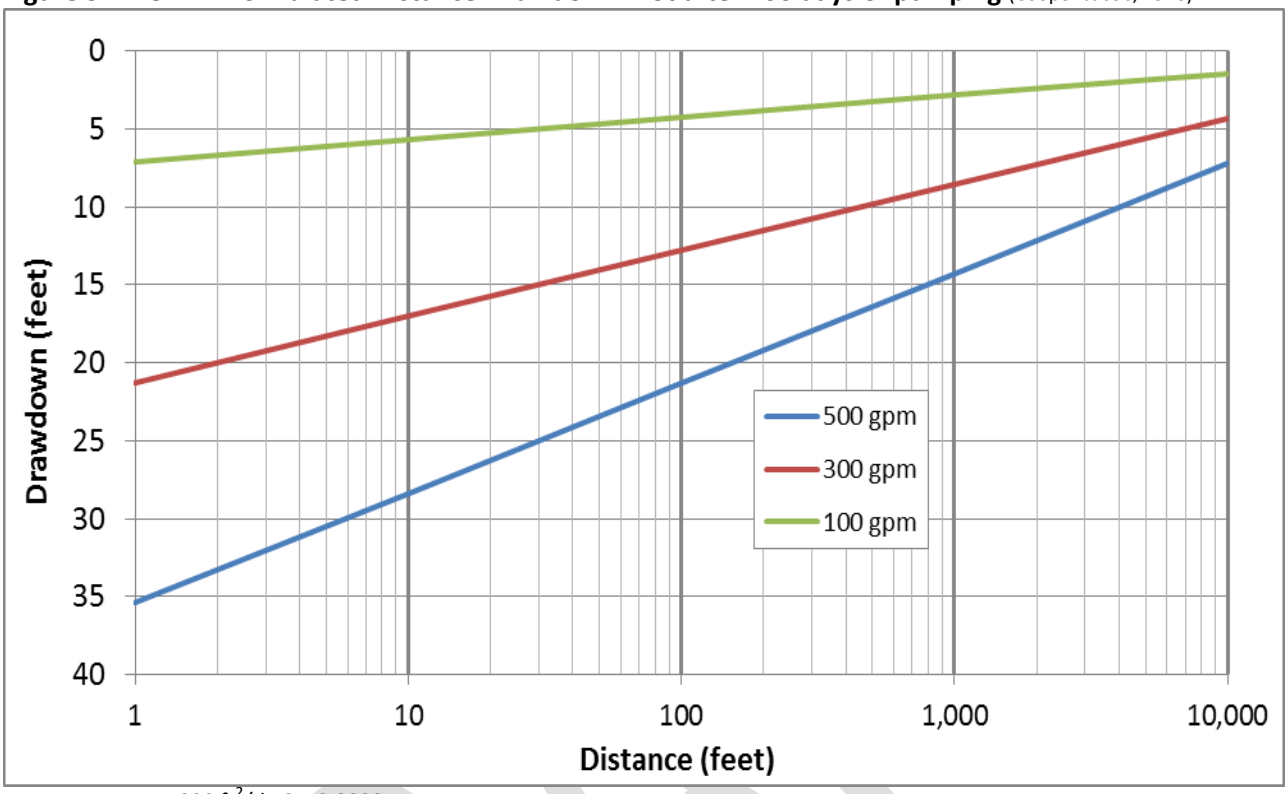
   Potential impairment on other groundwater water users due to well interference was assessed using the Cooper-Jacob (1946) method to determine interference drawdown that may occur in other wells located in the same portion of the aquifer system as Well 4R (Q(B)c; Figures 2 and 3). Aquifer parameters for transmissivity and storativity were reported as approximately 5,000 feet squared per day and 0.0003, respectively, based on well testing results (SPSW 2010, Appendix L). The results indicate that after 100 days of pumping Well 4R at the current permitted Qi (i.e., 750 gpm), aquifer drawdown would be approximately 11 feet at a 1 mile distance from the well. Increasing the pumping rate to 1,450 gpm (i.e., the maximum Qi if applications CG1-23897C and CG1-*07653 were approved) would lead to approximately 11 feet of additional drawdown 1 mile from Well 4R. However, increased Qi at Well 4R would be concurrent with an equal decrease in pumping at Wells 11.1 and 11.2, effectively lessening localized drawdown in the aquifer near these wells; this may be beneficial to the shallower Q(A)c portion of the aquifer (Well 11.1), where drawdown may be reduced by approximately 6 feet at a 1 mile distance from Well 11.1 (see below).

Figure 2: Well 4R Simulated Distance-Drawdown Plot after 100 days of pumping (Cooper-Jacob, 1946)



Notes: T = 5,000 ft^2/d; S = 0.0003

Figure 3: Well 11.1 Simulated Distance-Drawdown Plot after 100 days of pumping (Cooper-Jacob, 1946)



Notes: T = 5,000 ft^2/d; S = 0.0003

The other primary user of the Q(B)c portion of the aquifer system (i.e. Well 4R completion zone) is the Northeast Sammamish Sewer and Water District (NSSWD), which has a well located approximately 2.6 miles from Well 4R (2.2 miles from Well 11.2). Additional drawdown at the NSSWD Well from the proposed change is predicted to be approximately 6 feet after 100 days of pumping Well 4R at 1,450 gpm; however since this additional pumping/drawdown would be shifted from Well 11.2, interference drawdown is likely to remain within historical norms at NSSWD and other wells.

The requested POW is located in a deeper portion of the aquifer system (i.e., Q(B)c) than the existing POW (i.e., Q(A)c). These portions of the aquifer system have a common flow regime, with discharge to the Sammamish River and other downgradient waters within the Lake Washington watershed. Recharge for both portions of the aquifer occurs primarily at the center of the Sammamish Plateau as vertical percolation through the various strata. However, pumping tests results (AGI 1996) have indicated a lack of response between the Q(A)c and Q(B)c strata in the area of Well 11.1 and Well 11.2 (separated by approximately 25 feet). Ecology has made a decision to manage groundwater within the strata of the Sammamish Plateau as a single aquifer system and as such it is treated as one body of public groundwater (Wood 2015, personal communication).

Public Interest Considerations

The change request to Water Right Certificate G1-23897 (CG1-23897C) is to add an additional point of withdrawal (POW) to allow for redundancy and flexibility in system operations for SPWSD. SPWSD had over 16,000 active connections in 2010 and experienced a 75% increase in public connections between 1990 and 2000 (SPWSD, 2010). Due to high population growth and limited water availability, SPWSD requires the requested change to strengthen its reliability in water supply to the public.
The requested change is to add an additional POW without enlargement of the water right.

The additional POW will facilitate withdrawals from deeper portions of the aquifer, which may be preferable due to fewer groundwater users and lesser hydraulic connection with surface waters noted for this portion of the aquifer (e.g. Lake Sammamish and various local creeks). Available database records indicate no users of the Q(B)c aquifer in the vicinity of Well 4R, so impairment of other groundwater users is not likely. Hydraulic analysis of the aquifer in the vicinity of the proposed POW indicates that the other known user of this portion of the aquifer (Northeast Sammamish Sewer and Water District) will not be impaired.

Approval of the requested change would be in accordance with public interest as defined in RCW 90.03, as the new POW would provide a reliable source of public water and may lessen impacts on other users.

Conclusions

This change application is to add an additional point of withdrawal (POW) approximately 0.3 miles southwest from the existing POW. The proposed POW is located within the same aquifer system as the existing POW (Well 11.2). The requested change may provide additional public benefit by facilitation withdrawal of water from a part of the aquifer that has less water users and is in lower hydraulic continuity with surface waters in addition to providing a more reliable water source for SPWSD water users.

The new POW is an existing source of sufficient capacity and quality to provide beneficial use to SPWSD customers. Flow and water level monitoring equipment is in place to maintain withdrawals within the provisions of the water right. The well has operated in excess of 10 years under an existing water right without any identifiable impacts to the aquifer system.

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:

Q_i = 600 gpm
Q_a = 768 acre-feet per year (continuous)
For purposes of municipal supply

Points of Diversion

Well 11.1: NE ¼, NW ¼, Section 34, Township 25 North, Range 06 E. W. M
Latitude: 47.613424° Longitude: -122.02874°

Well 11.2: NE ¼, NW ¼, Section 34, Township 25 North, Range 06 E. W. M
Latitude: 47.61342° Longitude: -122.0287°

Well 4R: NW ¼, SW ¼, Section 34, Township 25 North, Range 06 E. W. M
Latitude: 47.609007° Longitude: -122.032027°'

Place of Use

Service area for Sammamish Plateau Water and Sewer District (SPWSD)

Andrew Austreng, Report Writer, Golder Associates *Date*

Chris Pitre, LHG, Report Writer, Golder Associates *Date*

Douglas H. Wood, LHG, Report Reviewer, Ecology *Date*

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Selected References

AGI, 1996. AGI, Inc. *Production Well 11.2 Construction and Testing Report: Sammamish Plateau Water and Sewer District.* Accessed as *Appendix L* in SPSWD, 2010.

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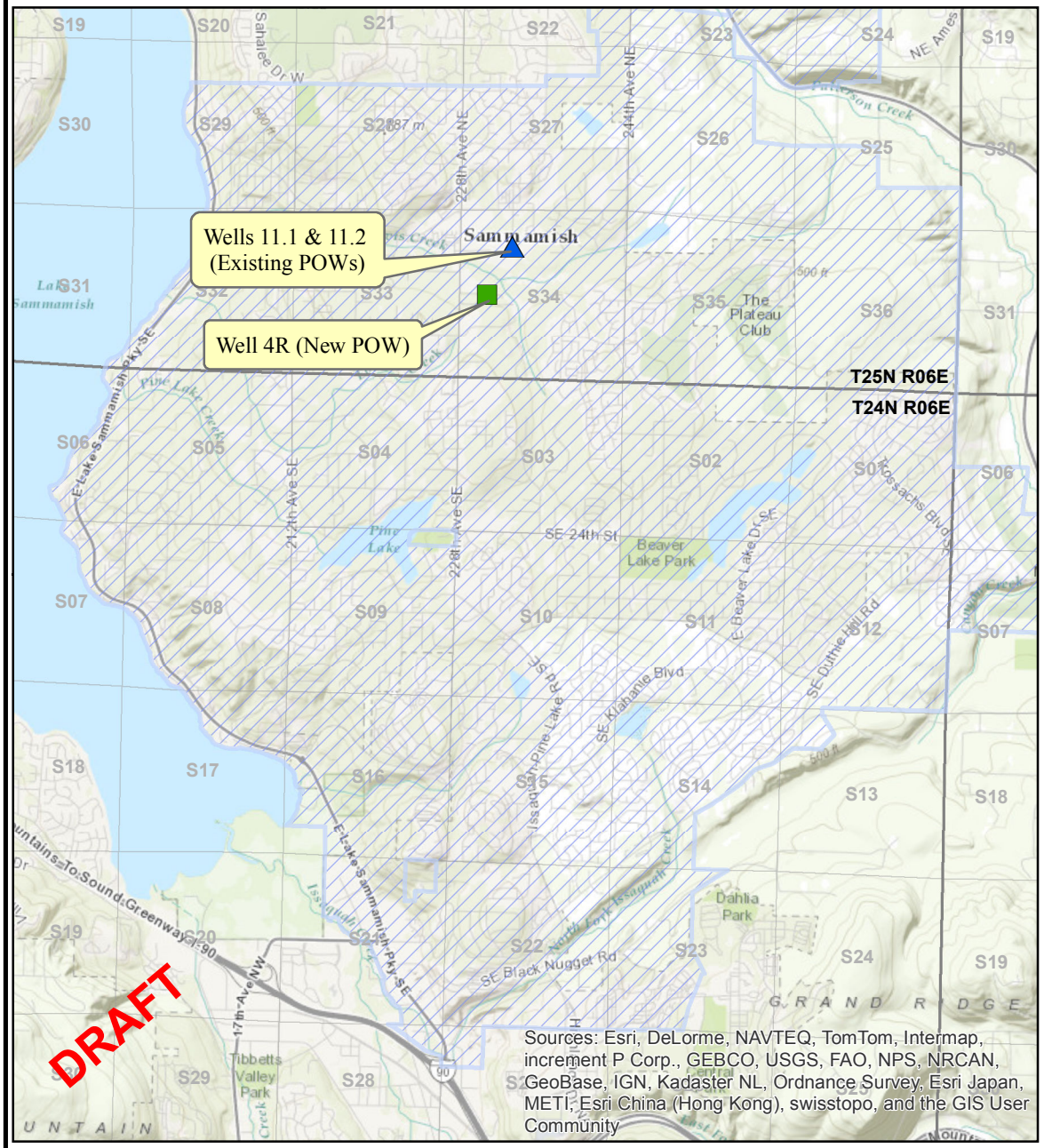
Sammamish Plateau Water & Sewer District
CG1-*07653C@1 & CG1-23897C@1
Section 34 T25N R6E.
WRIA 8 - King County



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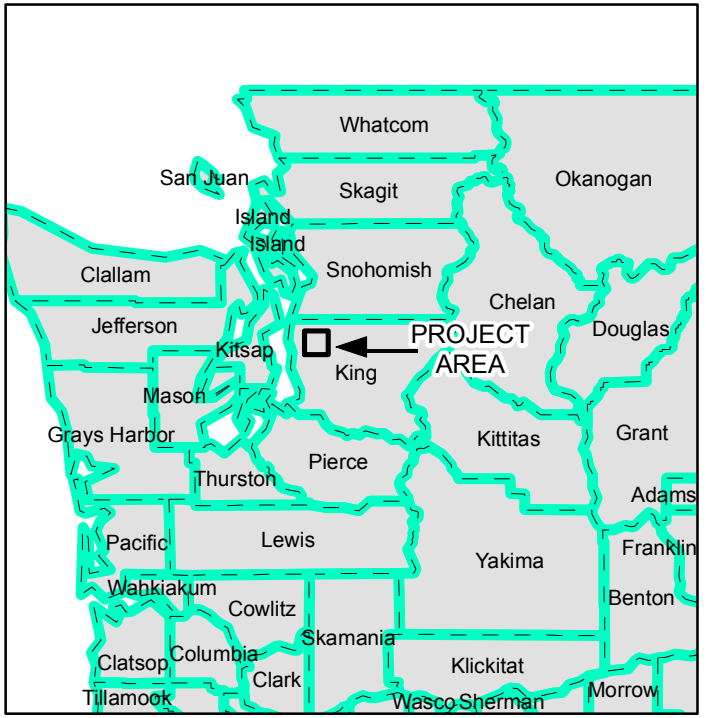

Legend

- **Authorized Place of Use**
- **Authorized Point of Withdrawal**
- **Requested Additional Point of Withdrawal**
- County Boundary

Golder Associates

Map Date: 4/28/2015

Place of use and point(s) of diversion/withdrawal are as defined on the cover sheet under the headings,'LOCATION OF DIVERSION/WITHDRAWAL' and 'LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED.'

FIGURE 1