File No. G2-30623
WAC Doc ID: 5843745

DEPARTMENT OF ECOLOGY
State of Washington

State of Washington
REPORT OF EXAMINATION
FOR WATER RIGHT APPLICATION

PRIORITY DATE	APPLICATION NUMBER
July 22, 2013	G2-30623

MAILING ADDRESS	SITE ADDRESS (IF DIFFERENT)
Spanaway Water Company PO Box 1000 Spanaway, WA 98387	

Quantity Authorized for Withdrawal or Diversion

DIVERSION RATE	UNITS	ANNUAL QUANTITY (AF/YR)
11,007	gpm	4,067.5

Purpose

PURPOSE	WITHDRAWAL OR DIVERSION RATE			ANNUAL QUANTITY (AF/YR)		PERIOD OF USE (mm/dd)
	ADDITIVE	NON-ADDITIVE	UNITS	ADDITIVE	NON-ADDITIVE	
Municipal	--	11,007	gpm	-	4,067.5	01/01-12/31

Source Location

WATERBODY	TRIBUTARY TO	COUNTY	WATER RESOURCE INVENTORY AREA
7 Wells	N/A	Pierce	12

SOURCE FACILITY/DEVICE	PARCEL	TWN	RNG	SEC	QQ Q	LATITUDE	LONGITUDE
Well 2	0319294062	19N	3E	29	SE/SE	47*05'54.79"	122*26'36.61"
Well 2A	0319294062	19N	3E	29	SE/SE	47*05'54.87"	122*26'36.34"
Well 3	8000012463	19N	3E	28	SE/SE	47*05'55.56"	122*25'34.36"
Well 6	5002280330	19N	3E	27	NE/NE	47*06'29.08"	122*24'15.53"
Well 8	0319331031	19N	3E	33	SE/NE	47*05'35.38"	122*25'31.55"
Well S2	Easement on 5003010880	19N	3E	35	NW/NW	47*05'38.64"	122*23'52.36"
Well 11 (proposed)	0319334075	19N	3E	33	NE/SE	47*05'22.61"	122*25'34.25"

Datum: WGS84

Place of Use (See Map, Attachment 1)

LEGAL DESCRIPTION OF AUTHORIZED PLACE OF USE

Area served by Spanaway Water Company as described in a Department of Health approved Water System Plan. See also RCW 90.03.386(2). RCW 90.03.386 may have the effect of revising the place of use of this water right.

Proposed Works

Well	Casing Size	Well Depth
WELL 2/2A	Both 12	315 and 335
WELL #3 (ABS144)	12	99
WELL #6 (AEC909)	16	520
WELL #8 (ACY118)	12	204
WELL S2 (ABS148)	12	122
Well 11 (proposed)	16	+- 450

Development Schedule

BEGIN PROJECT	COMPLETE PROJECT	PUT WATER TO FULL USE
Started	September 1, 2029	September 1, 2034

Measurement of Water Use

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

Provisions

Measurements, Monitoring, Metering and Reporting

An approved measuring device shall be installed and maintained for each of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", WAC 173-173, 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 for modifications to some of the requirements.

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

Water Use Efficiency

Use of water under this authorization shall be contingent upon the water right holder's maintenance of efficient water delivery systems and use of up-to-date water conservation practices consistent with

established regulation requirements and facility capabilities.

Proof of Appropriation
The water right holder shall file the notice of Proof of Appropriation of water (under which the certificate of water right is issued) when the permanent distribution system has been constructed and the quantity of water required by the project has been put to full beneficial use. The certificate will reflect the extent of the project perfected within the limitations of the permit. Elements of a proof inspection may include, as appropriate, the source(s), system instantaneous capacity, beneficial use(s), annual quantity, place of use, and satisfaction of provisions.

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

Findings of Facts
Upon reviewing the investigator's report, I find all facts, relevant and material to the subject application, have been thoroughly investigated. Furthermore, I concur with the investigator that water is available from the source in question; that there will be no impairment of existing rights; that the purpose(s) of use are beneficial; and that there will be no detriment to the public interest.

Therefore, I ORDER approval of Application No. G2-30623, 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 Hearing 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** 111 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 Olympia, Washington, this 8th day of April 2015.

Michael J. Gallagher

Michael J. Gallagher, Section Manager
Water Resources Program/SWRO
Department of Ecology

BACKGROUND

On July 23, 2013, the **Spanaway Water Company (Spanaway)** filed an *Application for Water Right Permit* with the State Department of Ecology (Ecology). Spanaway's application was filed for a non-additive "umbrella" water right to authorize beneficial use from existing wells and a new proposed well. This new proposed well will operate in a wellfield configuration with 6 of the existing Spanaway wells.

This application has been processed under Ecology's Cost Reimbursement Program. Pacific Groundwater Group (PGG) prepared this report under contract to Ecology. PGG reviewed all available documents pertaining to this and other related *Applications for Water Right*, including site conditions, hydrogeological and well construction reports, historical water use, and the standing of existing rights. Under the provisions of RCW 90.03.290 and 90.44, a water right may be issued upon findings that water is available for appropriation for a beneficial use, and that the appropriation will not impair existing rights or be detrimental to the public welfare. In accordance with these provisions, I recommend issuance of Permit G2-30623.

Table 1
Summary of Application No. G2-30623

Attributes	*Proposed*
Applicant	**Spanaway Water Company**
Application Received	July 23, 2013
Instantaneous Quantity	11,007 gpm
Source	6 wells (existing) 1 well (proposed)
Purpose of Use	Municipal supply
Period of Use	Year-round as needed
Place of Use	Area served by Spanaway Water Company as described in a Department of Health approved Water System Plan. See also RCW 90.03.386(2). RCW 90.03.386 may have the effect of revising the place of use of this water right

Legal Requirements for Application Processing

The following requirements must be met prior to processing a water-right application:

Public Notice

A public notice of the proposed appropriation was published in the Tacoma News Tribune on August 22nd and 29th, 2013. No protests were received as a result of this notice. Subsequent to the publication process, Spanaway contacted representatives of the Puyallup Tribe, Nisqually Tribe, and the Department

of Fish and Wildlife (WDFW) to inform them of the scope and context of the non-additive umbrella application, as well as the hydrogeologic tasks and modeling that would be performed.

State Environmental Policy Act (SEPA)

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

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

b. It is a groundwater right application for the appropriation of more than 2,250 gpm.

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

d. It is part of a larger proposal that is subject to SEPA for other reasons (e.g., the need to obtain other permits that are not subject to SEPA),

e. It is part of a series of exempt actions that, together, trigger the need to do make a threshold determination, as defined under WAC 197-11-305.

While the requested groundwater withdrawal rate exceeds the threshold that triggers SEPA, this application does not represent an increase in water already appropriated by previously issued water rights. Accordingly, this application is categorically exempt from SEPA and a threshold determination is not required.

Water Resources Statutes and Case Law

Under the provisions of RCW 90.03.290 and 90.44.050, a water right shall be issued upon findings that water is available for appropriation for a beneficial use and that the appropriation, as proposed in the application, will not impair existing rights or be detrimental to the public welfare.
This application has been processed under Ecology's Cost Reimbursement Program. Based on the provisions of RCW 43.21A.690 and RCW 90.03.265, PGG prepared this report under contract to Ecology.

INVESTIGATION

Evaluation of this application included, but was not limited to, research and/or review of the following:

- Department of Ecology records of surface and groundwater rights and claims, and of well construction reports within the vicinity of the subject production wells. http://www.apps.ecy.wa.gov/welllog/
- Robinson Noble, Inc., 2014, Water Right Impact Analysis, prepared for Spanaway Water Company.
- Robinson Noble, Inc., 2014, Phase 1 Water Rights Assessment, prepared for Spanaway Water Company.

- Savoca, Mark E., Welch, W.B., Johnson, K.H., Lane, R.C., Clothier, B.G., Fasser, E.T., 2010, Hydrogeologic framework, groundwater movement, and water budget in the Chamber-Clover Creek watershed and vicinity, Pierce County, Washington: Scientific Investigations Report 2010-5055.
- Walters, Kenneth, Kimmel, Grant E., 1968, Ground-water occurrence and stratigraphy of unconsolidated deposits, Central Pierce County, Washington: US Geological Survey Water Supply Bulletin No. 22.
- Spanaway Water Company's Water System Plan, prepared by RH2 dated September 2010.
- Jones (1999), and Borden and Troost (2001). Regional-level studies of the Clover Creek basin (Water Resource Inventory Area 12) were previously undertaken for the Tacoma-Pierce County Health Department in 1985 (Brown and Caldwell) and 2002 (Robinson & Noble).

A field visit was conducted on May 27th, 2014, by Jill Van Hulle and Dawn Chapel, LHG, of PGG, with Jeff Johnson, water system manager for Spanaway Water.

Project Description

The intent of this application is to secure a new water right to provide additional operational flexibility in a wellfield configuration. Spanaway's current water right portfolio allows withdrawal of adequate instantaneous and annual quantities. However, the limited physical capacity of some of the wells does not allow some water rights to be fully exercised, and some of the better producing production wells are authorized to pump less than their ideal operating capacities. To address these operational constraints, Spanaway has requested a non-additive water right and a new point of withdrawal.

Spanaway requests a total instantaneous withdrawal rate (Qi) of 11,007 gallons-per-minute (gpm) and a total annual quantity (Qa) 4,067.5 acre-feet per year (afy), all non-additive. These quantities represent the total Qi and Qa authorized under Spanaway existing water rights. These quantities also constitute the maximum amount of water that may be withdrawn from wells sited in the proposed wellfield, subject to the exercise of Spanaway's existing additive water rights.

The wellfield will involve 6 active production wells and a new proposed well, Well 11 (i.e., Wells 2, 2A, 3, 6, 8, S2, and new Well 11). In specific terms, Spanaway proposes to increase withdrawals from Wells 3, 8, S2 and new Well 11, and reduce withdrawals from Well 2, Well 2A and Well 6. Wells 3, 8, S2, and new Well 11 were selected for increased, non-additive production because pursuant to extensive modeling by Spanaway, it was determined that they can produce significant quantities of water in a flexible wellfield configuration without impairment of existing rights and surface waters.

Individual withdrawals from Wells 3, 8, S2, and new Well 11 (the wellfield) will be limited to the instantaneous and annual quantities identified in Table 5. Withdrawals from Wells 2, 2A and 6 will be reduced to the instantaneous and annual quantities also identified in Table 5. Withdrawals from all other wells and additive water rights will be exercised consistent with how those water rights were originally authorized, subject to the non-additive quantities produced by the wellfield.

As noted in Table 5, the maximum instantaneous quantity (Qi) proposed for pumping by Wells 3, 8, S2, and new Well 11 is limited to 9,000 gpm, which is less than the total Qi requested (and modeled) of 11,007 gpm. Spanaway is requesting a total Qi of 11,007 in the event prior to 2029 it is able to develop

new replacement well(s) sited within the wellfield that can recover, subject to the modeling assumptions and impairment analysis employed to support this application, authorized instantaneous quantity that cannot currently be produced by existing sources.

Spanaway has requested an extended development schedule to complete new Well 11, and other project improvements, to accommodate capital project financing constraints. As noted above, the new proposed Well 11 will be used in a wellfield configuration with Spanaway's Wells 3, 8, S2, 2/2A, and 6.

Site Description

Spanaway is a municipal water supply purveyor that serves an area of approximately ten square miles in unincorporated Pierce County, east of Joint Base Lewis-McChord and south of the Parkland area. All of Spanaway's retail water service area lies within the City of Tacoma's Unincorporated Urban Growth Area, entirely within the Pierce County Urban Growth Area.

Spanaway currently provides service to over 10,000 residential units and approximately 450 businesses. The total population within the service area is approximately 26,500. Based on its 2009 Comprehensive Water System Plan, Spanaway projects its service area population to grow to 34,233 by 2029.

The service area is located within the Chambers-Clover Creek Watershed (WRIA 12). North Clover Creek flows east-west and is located along the northern boundary of the service area (see Figure 1). The closest Spanaway water supply wells to North Clover Creek are Well 5 and Well 9 (about 0.6 miles). Morey Creek, Spanaway Lake, and Spanaway Creek flow south-north and are located along the western boundary of the service area. The closest Spanaway water supply wells to the Spanaway/Morey Creek system are Wells 1, 2, and 2a (about 0.3 miles). The confluence of North Clover Creek and Spanaway/Morey Creek occurs about 2 miles northwest of the service area to form the main reach of Clover Creek which then discharges to Steilacoom Lake which drains to Puget Sound via Chambers Creek.

Water Rights Appurtenant to the Place of Use

Spanaway holds 12 additive water rights and two non-additive water rights to withdraw water from 14 wells in the Chambers-Clover Creek Watershed (WRIA 12). Spanaway **has an additive annual quantity (Qa) of 4,067.5 afy and an additive instantaneous** quantity (Qi) of 11,007 gpm. The maximum water use for the system occurred in 2009 when use totaled 3,394 acre-feet.

Table 2
Spanaway Water Company
Annual Production

Year	Total Gallons	Ac-ft/Yr	ERU's	Comment
2014	1,062,909,932	3,262	10,643	long warm, dry summer
2013	984,048,824	3,020	10,511	
2012	1,002,161,516	3,076	10,202	
2011	950,373,872	2,917	9,936	
2010	949,044,416	2,912	9,737	
2009	1,105,918,416	3,394	9,585	long warm, dry summer

In 2029 Spanaway anticipates having 13,112 Equivalent Residential Units (ERUs) and a projected Average Daily Demand of 273 gallons per day/ERU. Based on projections Spanaway's current allocation is projected to meet demand through the year 2030.

Table 3
Water Rights Summary

Number	Priority Date	Source	Qi (gpm)	Primary Qa (afy)	Non-additive Qa (afy)
4815C	2-19-1963	Well 1	252	403	
G-2-20177C	4-21-1972	Well 2	1,000	800	
G2-20178C	4-21-1972	Well 3	500	400	
G2-20179C	4-21-1972	"Old" Well 4	200	160	
G2-20180C	4-21-1972	Well 5	550	213	227
G2-20182C	4-21-1972	Wells 5 & 7	3,000	44	2,400
G2-24502C	4-7-1977	Well 8	465	619	125
G2-25936C	7-27-1981	Well 9	1,250	145.5	1,015.5
G2-26091C	2-19-1982	Well S1	90	27	
G2-29991C	10-2-1986	Well S2	800	31	27
G2-27245C	12-9-1987	Well 2A	900	160	560
G2-27957C	11-5-1990	Well S2	800		9
G2-27958C	11-5-1990	Well 4	1,200	1,065	
G2-28697P	12-2-1992	Well 6	1,200 non additive*		1,290
		Totals	**11,007**	**4,067.5**	**5,653.5**

*G2-28697P is entirely supplemental to quantities under G2-20182C (well 7)

Aquifer Characterization and Site Hydrogeological Conditions

The following summary of the hydrogeologic setting is primarily based on the recent U.S. Geological Survey (USGS) study on the Clover-Chambers Creek basin (Savoca and others, 2010) and previous investigations by Robinson Noble completed for Spanaway Construction reports for Spanaway's wells involved in this application, as described in *Hydrogeologic Evaluation and Impairment Considerations – Technical Memorandum Spanaway Water Company Application G2-30623*, prepared by Dawn Chapel, LHG of PGG, were also used as part of this evaluation.

Previous work describing the geology of the area include Walters and Kimmel (1968), Robinson & Noble (1992 and revised 2008), Jones (1999), and Borden and Troost (2001). Regional-level studies of the Clover Creek basin (Water Resource Inventory Area 12) were previously undertaken for the Tacoma-Pierce County Health Department in 1985 (Brown and Caldwell) and 2002 (Robinson & Noble). These older efforts have now been partially supplanted by the USGS study as it is broader in context and provides a more comprehensive description of the regional water resources.

The local area is underlain by a thick sequence of unconsolidated glacial and interglacial sediments deposited during multiple continental glacial advances and retreats during the Pleistocene epoch (Borden and Toost 2001). The surface topography is relatively flat to gently rolling with elevations ranging from about 500 to 300 feet above mean sea level.

The USGS conceptual model describes the hydrogeologic units of the area as being comprised of 11 layers of alternating water-bearing (aquifer) and non-water-bearing (confining layers) sediments. Descriptions for the each of hydrostratigraphic units defined by the USGS (2001) are listed below ("traditional" geologic map unit abbreviations are provided in parenthesis, where applicable):

- Aquifer A1 – Primarily consists of stratified silt, sand, and gravel deposits of Vashon recessional outwash (Qvr) of the Frasier glaciation. Locally, this unit includes very coarse outwash gravels of the Steilacoom Gravel (Qvs) at land surface. The unit is typically a few feet up to about 50 feet thick. Where saturated, the unit represents a water-table aquifer and is often in direct continuity with surface water bodies.
- Confining unit A2 – This unit is dominated by glacial till deposits of the Vashon glaciation (Qvt), which are often present at land surface when aquifer A1 is not present. Ice-contact and fine-grained glaciolacustrine deposits are also included in this unit. The material is typically low-permeability mixtures of clay, silt, sand and gravel, often compacted and dense. In the local area, the unit averages about 70 feet in thickness, but this can increase to over 100 feet in a few places.
- Aquifer A3 – The aquifer below confining unit A2 is mainly composed of deposits from the Vashon advance outwash (Qva). In some areas, older, pre-Fraser coarse-grained non-glacial (Qpfc) deposits are also included in this unit. The material is usually well-sorted sand or sand and gravel, sometimes with lenses of silt or clay. Locally, the aquifer appears to be confined by the overlying till. Spanaway's wells 1, 3, S1, and S2 all produce water from aquifer A3.
- Confining unit B – This unit is dominated by deposits of the Olympia Beds (Qob), low-permeability silts and clays from the Olympia-age interglacial period, and glaciolacrustrine clays from the early Vashon called the Lawton Clay (Qvlc). Isolated areas of the unit can contain coarser-grained sands that can support limited water production, but these are uncommon and discontinuous. The unit is typically more than 50 feet thick in the area and results in strong confinement of the underlying aquifer.
- Aquifer C – Sometimes also called the sea-level aquifer due its coincident elevation, this unit is usually sand and gravel deposits of pre-Olympia age glacial drift, but lower-permeability deposits of silt, clay, or till are sometimes encountered. The aquifer is 70 to 150 feet thick in most places in the area. Productive zones in this unit seem to be more discontinuous across the region than is the case with aquifers A or E. The final USGS conceptual (Savoca and others, 2010) and numerical models (Johnson and others, 2011) place Spanaway's wells 6, 7, 8, and 9 in

aquifer C. However, water quality signatures suggest that Well 5 is in aquifer C and Well 6 should be in aquifer E. This discrepancy may warrant future investigation, but for the purposes of this study, the USGS designations are retained. Proposed Well 11 will also target aquifer C.

- Confining unit D – Regionally-extensive, this confining unit is made up of non-glacial deposits of alluvial and lacustrine sand, silt, and clay. Laid down during the Puyallup interglacial period, the materials are often distinctively colored, suggesting source material originating from Mount Rainier and vicinity; ash layers are sometimes noted. Where present, these components form important marker beds in the vertical geologic sequence. The non-glacial deposits of this unit occasionally have areas of higher permeability that can yield useable sources of water, but as with confining unit B, they are typically intermittent and discontinuous. The unit is up to 200 feet thick in the local area, but further to the west, the thickness can increase to over 300 feet.
- Aquifer E –Aquifer E is dominated by glacial drift deposits that appear to correlate with the Stuck Glaciation (Walters and Kimmel, 1968). It mainly consists of deposits of silt, sand, and gravel. The aquifer is typically highly confined and regionally extensive. The unit ranges in thickness from a few tens of feet to over 200 feet. However, few wells in the area tap this aquifer, mainly due to the required depth of drilling. As noted above, water quality signatures imply that Well 6 is in aquifer E. The USGS models place Wells 2, 2A, 4, and 5 in this aquifer. Analyses completed during wellhead protection planning (Robinson, Noble and Saltbush, 2008) assigned Wells 2, 2A, and 5 to aquifer C, mainly based on water level relationships. Again, it may be worth resolving this discrepancy in the future, but as noted earlier the USGS designations are retained for this study.

Spanaway's Water Sources

Spanaway's water production comes from wells in aquifers A3 (Wells 1, 3, S2) and C (Wells 5,7,8,9), with lesser amounts supplied from aquifer E (Wells 2, 2A,4,6).

Table 4 – Spanaway Wells

Name	Casing Size	Well Depth	Well ID Tag
WELL #1	12	106	ABS146
WELL #2	12	315	CAN792
WELL #2A	12	334	CAN793
WELL #3	12	99	ABS144
WELL #4	16	645	ACK121
WELL #5R	16	398	AEC945
WELL #6	16	520	AEC909
WELL #7	12	300	AEA455
WELL #8	12	204	ACY118
WELL #9	12	322	CAN730
WELL #S2 SHAFFER	12	122	ABS148
WELL #S1 SHAFFER	8	116	ABS142

Proposed Well 11 will serve as a new source that will tap the same aquifer as existing Well 8 and operate within the proposed wellfield configuration. To achieve this objective, Spanaway proposes that Well 11 be designed for a 16-inch casing and drilled to a depth of approximately 450 feet.

Modeling Approach

In support of this water right application, Spanaway contracted with Robinson Noble to evaluate the aquifers at the well sites, assess if water is physically available, and determine if proposed withdrawals would cause impairment to existing water rights and regulated surface water.

Robinson Noble used the MODFLOW groundwater flow model created by the U.S. Geological Survey for the Chambers-Clover Creek watershed (Johnson and others, 2011) to predict aquifer drawdown, impacts to surface water, and potential to impair existing water rights under several potential pumping scenarios. None of operational scenarios allowed the total Qi and Qa authorized under Spanaway's water right portfolio to be exceeded.

Robinson Noble evaluated the potential for impairment by developing a series of baseline scenarios modeling withdrawals allowed under Spanaway's currently authorized water rights and compared them to predictive model scenarios using the proposed new water right. The original 5-year transient USGS model (Savoca, Mark E, 2010) was modified by Robinson Noble to a 2-year simulation[1] and monthly stress periods were revised to create a single 3-day stress period during the summer (July 29-31). The 3-day stress period was used to evaluate the effects of Qi (maximum instantaneous pumping rate) and July was chosen because historically it is the highest water use month. Each model year began September 1 and ended August 31.

Based on the results of the modeling, Robinson Noble proposed withdrawal rates for each well in the proposed wellfield. The pumping rates shown in Table 5 (below) were determined by Robinson Noble to be the maximum that can be withdrawn and permitted at each well without causing impairment to existing water rights or regulated surface water. As noted earlier, withdrawal rates from all of Spanaway's other wells will not change. At no time will total withdrawal at the wellfield exceed 11,007 gpm, and 4,067.5 acre-feet, however, the wells will be pumped in various combinations under that threshold consistent with limits suggested by the applicant for wellfield operation

[1] Initial heads for the 2-year model were assigned from the last stress period after the first 3 years of the original 5-year model.

Table 5
Spanaway Proposed Maximum Production Rates By Well

Well	Maximum Production under Proposed New Rights	
	instantaneous (gpm)*	annual (afy)**
2/2A	*500*	*400*
3	**1,500**	**2,400**
6	1,200	*500*
8	**3,000**	**2,400**
S2	**3,000**	**800**
11 (proposed)	**1,500**	**900**

***The maximum instantaneous quantity (Qi) proposed for pumping by Wells 3, 8, S2, and new Well 11 is limited to 9,000 gpm, which is less than the total Qi requested (and modeled) of 11,007 gpm.** Spanaway is requesting a total Qi of 11,007 gpm in the event prior to 2029 it is able to develop new replacement well(s) sited within the wellfield that can recover, subject to the modeling assumptions and impairment analysis discussed herein, authorized instantaneous quantity that cannot be currently produced by existing sources.

****4,067.5 acre-feet per year is a maximum withdrawal rate, the actual annual withdrawals from wellfield wells will fluctuate to the values reflected on Table 5, but will not be exceeded.**

italics indicates a reduction from current rights
bold type indicates an increase under the proposed application

Potential Impairment to Surface Water

WAC 173-512 closes several streams and lakes in the Chambers/Clover Creek Watershed to further consumptive appropriations. For future permitting actions related to groundwater withdrawals, decisions must consider the natural inter-relationship of surface and groundwater.

Potential surface water impacts were assessed using the USGS model and different pumping scenarios with equal or smaller impacts than baseline conditions. PGG reviewed 74 predictive model scenarios and evaluated if full exercise of water rights closest to streams would result in greater impacts than each new proposed pumping scenario. Based on our review and the criteria developed by Robinson Noble, it does not appear that the proposed Qi and Qa quantities cited in Table 4 will result in impairment to regulated surface water.

Predicted Changes to Groundwater Levels

PGG evaluated the potential to impair existing groundwater users by reviewing maps of predicted aquifer drawdown under the proposed pumping scenarios in Table 4 (Robinson Noble, 2014). Since the wells with proposed increases are completed in Aquifer A3 (Well 3 and Well S2) or Aquifer C (Well 8 and

Proposed Well 11); the evaluation focused on maximum drawdown predicted in these aquifers when the wells were pumped at their full proposed quantity.

Pumping Effects in Aquifer C

Based on Robinson Noble's predictive model, pumping Well 8 and Proposed Well 11 would cause about 60 feet of drawdown in Aquifer C locally at each well. Because Well 8 and the Proposed Well 11 will only be 1,300 feet apart, interference drawdown during simultaneous pumping could be significant. However, Spanaway can manage that by adjusting or alternating pumping schedules.

Based on modeling results, nearby wells potentially completed in Aquifer C could experience a maximum impact of up to 5 to 10 feet of drawdown during operation of Spanaway's wells at full Qi. However, a review of well construction reports from other wells completed in Aquifer C indicates that these other wells have a significant amount of available drawdown and should not be adversely affected. Spanaway's own Well 8, for example, has 277 feet of available drawdown which is similar to Parkland's Well 12 which has almost 300 feet of available drawdown. Other non-municipal wells completed in Aquifer C (see logs for Keller, Leonard and Earle) have respective available drawdowns of 150, 130 and 92 feet. In all cases the nearest wells to Spanaway's wells are other Spanaway wells, and the applicant intends to operate their sources so as not to affect their own operation. Given the available drawdown in Aquifer C - the amount of drawdown expected from this pumping regime is not likely to result in impairment of other wells completed at this depth.

Pumping Effects in Aquifer A3

The model predicts pumping could result in a maximum drawdown in Aquifer A3 of about 16 feet at Well 3 and 18 feet at Well S2. Well data indicates both wells have adequate available drawdown to accommodate the predicted water level drop. Drawdown would decrease to less than 4 feet within a distance of approximately 2,000 feet away from each well.

Available drawdown in Aquifer A3 varies from about 160 feet to 40 feet near Spanaway Well 3 and 120 feet to 60 feet near Spanaway Well S2[2] (Robinson Noble, 2014). Modeling results predict the maximum impact on an existing well to be about 10% of its available drawdown (4 feet of drawdown in an area with 40 feet of available drawdown) which is not likely to result in impairment.

Potential Impairment to Existing Groundwater Users

Figure 1 shows the locations of public water supply systems in relationship to Spanaway's production wells. These water systems include Group B and smaller Group A water systems that don't hold formal water right permits and are exempt from permitting, as well as larger systems with corresponding water right authorizations. Additionally, the Fir Lane Memorial cemetery holds a groundwater certificate for irrigation from two wells about 2000 feet from Spanaway Well 3. Based on reported well depths[3], most of the nearby wells appear to be completed in Aquifer A3 and therefore can expect to see about 4-feet of interference drawdown during operation of Spanaway's wells at full Qi.

[2] Map provided to PGG on October 10, 2014.

Thirty-one groundwater certificates and four surface water certificates were identified by Robinson Noble within and surrounding the Spanaway service area. This total includes Spanaway's 13 certificates; a full list of water rights on file with Ecology is included as Table 3 in the supporting hydrogeological memo, PGG 2014.

Quantities for Permit

The quantity approved for this authorization is 11,007 gpm (Qi) and 4067.5 acre-feet (Qa), non additive. Of these quantities, withdrawals from each well sited in the wellfield (i.e., Wells 3, 8, S2, 2/2A, 6, and proposed Well 11), will be limited to the quantities identified in Table 5,

Priority Processing

RCW 90.03.265(2) provides that, in pursuing a cost-reimbursement project, the Department must determine the source of water from which the water is proposed to be diverted or withdrawn, including the boundaries of the area that delimit the source. The Department must determine if any other water-right applications are pending from the same source. A water source may include surface water only, groundwater only, or surface and groundwater together, if the Department finds they are hydraulically connected. The Department shall consider technical information submitted by the applicant in making its determinations under this subsection.

RCW 90.03.265(1)(b) provides that the requirement for an applicant to pay for the processing of senior applications does not apply in situations where the water allocated to one party will not diminish the water available to a senior applicant from the same source. Because there are no other pending groundwater applicants that will be affected by the requested allocation, this application can be processed prior to other pending applications.

Four Statutory Tests

This Report of Examination (ROE) evaluates the application based on the information presented above. To approve the application, Ecology must issue written findings of fact and determine that each of the following four requirements of RCW 90.03.290 has been satisfied:

1. Water is available. The requested production under this proposed non-additive water right would not constitute a new appropriation, but simply allow the continued exercise of existing additive rights. Consequently, no net impact to existing water availability conditions is anticipated. The well sites are probably physically capable of producing the water however Spanaway may need to develop – and test additional or replacement well(s) for increased capacity. No new water allocation will occur as a result.
2. Existing water rights, including surface waters subject to instream flow rules (WAC 173-510, WAC 173-511, and WAC 173-512) are not anticipated to be impaired by the proposed withdrawals. As noted above, the quantities requested are completely non-additive to existing rights and do not constitute a new appropriation.

3. Use of the water by Spanaway for municipal purposes is considered a beneficial use, (RCW 90.14.031)
4. The issuance of this permit is consistent with RCW 90.54 (Water Resources Act of 1971) which requires allocation of water in a manner that preserves instream resources, protects the quality of water, provides adequate and safe supplies of water to serve public need, and makes water available to support the economic well-being of the state and its citizens. The use of the water by Spanaway is not detrimental to the public welfare and will enable Spanaway to meet the water supply needs of its service area consistent with its approved water system plan.

CONCLUSIONS

The conclusions based on the above investigation are as follow:

1. The proposed appropriation for municipal supply is a beneficial use of water;
2. The requested quantity of 11,007 gpm and 4,067.5 acre-feet per year, is available for appropriation as a non-additive allocation;
3. The appropriation will not impair senior water rights; and
4. The appropriation will not be detrimental to the public interest.

RECOMMENDATION

Based on the information presented above, the author recommends that the request to appropriate 11,007 gpm be approved in the amounts described, limited, and provisioned on page 1 through 3 of this report.

Report by: Jill E Van Hulle

Jill Van Hulle, Pacific Groundwater Group Date

Reviewed by: _____

Tammy Hall, Water Resources Program Date

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Figure 1

Spanaway Water Company Wells and Other Nearby Existing Wells

Spanaway

PgG