



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION
To Appropriate Public Waters of the State of Washington

PRIORITY DATE	APPLICATION NO.	PERMIT NO.	CERTIFICATE NO.
August 31, 1993	G1-27298		

NAME
William Varley and Cameron Carter

ADDRESS/STREET	CITY/STATE	ZIP CODE
432 Pinneo Road	Eastsound, WA	98245

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Two Wells
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND (cfs)	MAXIMUM GALLONS PER MINUTE (gpm)	MAXIMUM ACRE FEET PER YEAR (ac-ft/yr)
	30	8

TYPE OF USE, PERIOD OF USE, QUANTITIES
Irrigation of six acres, during irrigation season, 7.7 acre-feet per year Domestic Supply, year round, 0.3 acre-feet per year

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
Drilled well is located 95.8 ft North and 2273.6 ft East of the SW corner Sect. 3 Dug well is located 108.6 ft south and 2238.5 ft east of NW corner Sect. 10 All within Township 36 North, Range 2 West, W. M. in San Juan County, Washington.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP	RANGE	WRIA	COUNTY
SE1/4 SW1/4 (Drilled Well)	3	36N	2W	2	San Juan
NE1/4 NW1/4 (Dug Well)	10				

PARCEL NUMBER	Latitude	Longitude	NAD 1983 HARN
261021001000	Drilled well: 48.6311	122.9355	
	Dug well: 48.6306	122.9357	

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Attachment 1 shows the location of the authorized place of use and points of withdrawal
Attachment 2 provides the legal description of the property on which water is to be used

DESCRIPTION OF PROPOSED WORKS

The Varley/Carter irrigation system consists of two wells which provide water to six acres located in the Westsound area of Orcas Island. Each well pumps water to a separate system each containing a pressure tank and two spigots for hand line irrigation and overhead sprayers. Irrigated crops will consist of 5½ acres of fruit trees and ½ acre of blueberries.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE	COMPLETE PROJECT BY THIS DATE	WATER PUT TO FULL USE BY THIS DATE
Already started	October 1, 2020	October 1, 2022

PROVISIONS

- An approved measuring device shall be installed and maintained in accordance with the rule "Requirements for Measuring and Reporting Water Use", WAC 173-173.
 - Water use data shall be recorded annually. Water use data shall be submitted via the Internet. To set up an Internet reporting account, access <https://fortress.wa.gov/ecy/wrx/wrx/Meteringx/>. If you do not have Internet access, data shall be maintained by the property owner and promptly submitted to Ecology upon request. Recording and retention of data by the water right holder are required to inform the water users about how much water is used, when the water is used and to assist users in efficient water management.
 - WAC 173-173 describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements".
 - Department of Ecology personnel, upon presentation of proper credentials, shall 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.
- A certificate of water right will issue for only that quantity of water that has been diverted and applied to actual beneficial use. Such quantity applied to actual beneficial use shall not exceed the quantity specified in this report of exam and will be calculated based on the best information available to Ecology, including metering data and/or water duty analysis.
- A certificate of water right will not be issued until a final investigation is made.

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. Furthermore, I concur with the investigator that water is available from the sources in question, the purpose of use is beneficial, there will be no impairment of existing rights, and there will be no detriment to the public interest.

Therefore, I ORDER approval of Application No. G1-27298, subject to existing rights and the provisions listed above.

You have a right to appeal this ORDER. To appeal this you must:

- File your appeal with the Pollution Control Hearings Board within 30 days of the "date of receipt" of this document. Filing means actual receipt by the Board during regular office hours.
- Serve your appeal on the Department of Ecology within 30 days of the "date of receipt" of this document. Service may be accomplished by any of the procedures identified in WAC 371-08-305(10). "Date of receipt" is defined at RCW 43.21B.001(2).

Be sure to do the following:

- Include a copy of this document that you are appealing with your Notice of Appeal.
- Serve and file your appeal in paper form; electronic copies are not accepted.

1. To file your appeal with the Pollution Control Hearings Board

Mail appeal to:

Deliver your appeal in person to:

The Pollution Control Hearings Board
PO Box 40903
Olympia, WA 98504-0903

The Pollution Control Hearings Board
4224 – 6th Ave SE Rowe Six, Bldg 2
Lacey, WA 98503

OR

2. To serve your appeal on the Department of Ecology

Mail appeal to:

Deliver your appeal in person to:

The Department of Ecology
Appeals Coordinator
P.O. Box 47608
Olympia, WA 98504-7608

OR

The Department of Ecology
Appeals Coordinator
300 Desmond Dr SE
Lacey, WA 98503

3. And send a copy of your appeal to:

Andrew B. Dunn, LG, LHG
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008

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>.

Signed at Bellevue, Washington, this 3rd day of SEPTEMBER, 2009.



Andrew B. Dunn, LG, LHG
Section Manager
Northwest Regional Office
Water Resources Program

INVESTIGATOR'S REPORT

BACKGROUND

Description and Purpose of the Project

This property and neighboring properties in the valley have historically been planted in fruit trees. At least half of the acreage proposed for this project already exists as orchard, however, many of the trees are old and need to be replaced. Claim G1-042163CL, for 4 gpm and 6.75 acre-feet per-year was filed on this property.

The Varley/Carter water right application for domestic supply and irrigation was received on August 31, 1993, for 5 gpm from one well. Subsequently the applicant decided to apply for, and re-published for, a total pumping rate of 30 gpm from two wells.

The Varley/Carter irrigation system consists of two wells which provide water to six acres located in the West Sound area of Orcas Island. Each well pumps water to a separate system, each containing a pressure tank and two spigots for hand line irrigation and overhead sprayers. Irrigated crops will consist of 5½ acres of fruit trees; apples, plums, cherries, pears, and Asian pears, and ½ acre of blueberries.

Legal Requirements for Application Processing

Chapter 90.03 RCW authorize the appropriation of public water for beneficial use and describes the process for obtaining water rights. Laws governing the water right permitting process are contained in RCW 90.03.250 through 90.03.340.

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

- **Public Notice**
Public notice of the application was originally published in *The Journal of the San Juan Islands* on May 4 and May 11, 1994. Re-publication occurred in *The Islands' Sounder* on May 6 and May 13, 2009. There were no written protests following each publication during the statutory 30-day protest period.
- **State Environmental Policy Act (SEPA)**
The subject water right application is categorically exempt under SEPA WAC 197-11-305 and WAC 197-11-800(4) because the instantaneous quantity is less than the 2,250 gallons per minute threshold.

INVESTIGATION

In considering this application, my investigation included, but was not limited to, research and/or review of:

- USGS Eastsound, Wash. 7.5 minute topographic map
- Department of Ecology (1975): Water Supply Bulletin No. 46, Geology and Water Resources of the San Juan Islands
- Geological Society of America Special Paper 221 (1988): The Late Cretaceous San Juan thrust system, San Juan Islands, Washington
- U. S. Geological Survey Water-Resources Investigations Report 02-4114 (2002): Estimates of Ground-Water Recharge from Precipitation to Glacial-Deposit and Bedrock Aquifers on Lopez, San Juan, Orcas, and Shaw Islands, San Juan County, Washington
- Hydrogeologic Report of this application (2009) by: John M. Rose, Department of Ecology
- Washington State University, (1985 and 1992): State of Washington Irrigation Guide
- Water well reports for Orcas Island
- Notes and GPS data from my site visit on March 26, 2009
- Records of existing water rights in the vicinity

Geographic Setting of the Place of Use and Point of Withdrawal

The West Sound area is located on the south-central area of the west half of Orcas Island in the San Juan Islands. The property is located about 3 miles north of the Orcas ferry dock to the east of West Sound itself approximately 3/4 mile from White Beach Bay on the southern edge of Crow Valley and west of Mt. Woolard (Attachment 1). Generally the area consists of relatively flat low lying areas to the west, most notably Crow Valley, and hills to the east. The most prominent features in the area are Mt. Woolard to the east with an elevation of 1192 feet, and

Turtleback Mountain to the northwest with an elevation of 1519 feet. The mountains and hills are heavily forested and the lowlands have mostly been cleared as pastureland.

Geological Background of the San Juan Islands as taken from John Rose's Hydrogeologic Report:

The geology of the San Juan Islands is very complex. It consists of a series of allochthonous terranes mostly of island arc and shallow marine origin of early Paleozoic to middle Cretaceous age which were accreted onto the North American continent prior to subsequent compressional faulting. During the late Cretaceous, imbricate thrust faulting created a series of sub-parallel nappes which generally divide each of the five identified terranes. This faulting also resulted in pervasive high-pressure metamorphism and the creation of intermittent tectonic zones along the fault contacts. These units were then tilted to the southeast, probably during the Tertiary period. Subsequent advance and retreat of continental glaciers of the Vashon Stade during the Fraser Glaciation approximately 10,000 years ago deposited sequences of intermixed clay, silt, sand and gravel in low lying areas.

Of particular note are the Turtleback, Orcas, and Constitution formations that underlie the glacial drift in the study area. The Paleozoic Turtleback Complex is one of two formations that are part of the terrane of the same name. It consists of coarse grained metamorphosed gabbros and quartz diorites often intersected with younger finer grained dikes of varying igneous compositions. The Lower Permian–Lower Jurassic Orcas formation is a part of the Deadman Bay terrane and consists of ribbon chert interspersed with thin basaltic beds and limestone lenses of varying thickness. The Upper Mesozoic Constitution Formation of the Garrison terrane consists of massive, poorly bedded sandstone, mudstone, ribbon chert and minor pillow basalt.

Hydrogeology of the West Sound Area of Orcas Island as taken from John Rose's Hydrogeologic Report:

The geology within a mile radius of the Varley well is varied, consisting of slabs of Turtleback gabbros and diorites and Orcas chert overlaid by a Vashon glacial drift lobe that extends approximately 1 mile along a narrow, shallow valley to the east. (See Geologic Map Attachment 3) To the northwest is the southeast-dipping Orcas thrust fault that separates the Paleozoic Turtleback complex from the younger Deadman Bay terrane. This well-defined major fault, which is a little more than ¼-mile from the Varley wells, probably constitutes a major hydrogeologic divide since it extends from West Sound to East Sound in a northeast trending direction and may inhibit recharge and the available volume of water from areas to the north in the underlying bedrock below the glacial drift. To the southeast lies the meandering Rosario thrust fault which separates the Orcas formation from the Constitution formation. This fault also dips to the southeast and may also put similar constraints on available water.

The drilled well was completed on July 7, 1988. It is drilled in bedrock to a depth of 305 ft. There appears to be 18 ft of glacial material described by the driller as clay overlying a sequence of rock described as black and soft followed by what is described in the report as black quartz. Based on the well driller report, previous geological mapping, and rock samples collected during a series of geologic field trips to Orcas Island, it is my conclusion the drilled well penetrates into the Orcas formation consisting primarily of well fractured ribbon chert. Since permeability in bedrock is extremely low, the water availability is controlled by secondary fractures that allow for the storage and movement of water. Wells in this type of environment usually have low pumping rates.

It is unclear when the dug well was constructed, but the applicant believes it was dug prior to the construction of the drilled well. No well log has been located for this well. The well penetrates only the glacial drift material. Transmissivity in this well is expected to be high due to the permeability of this material. Moreover, based on topographic and geologic evidence, it is inferred this will be an area of ground water flow convergence into the shallow drift both from Crow Valley and from surface water runoff and infiltration from the southeast.

Site Visit

On March 26, 2009, John Rose and I met with the applicant who gave us a tour of the wells and irrigation system. It is located approximately 3 miles north of the Orcas Island ferry landing on the south side of Pinneo Road. We observed the wells, plumbing, pressure tanks, faucets for hand line irrigation and the irrigation area.

Irrigation Water System Details

There are two wells on the property approximately 180 feet apart, across a section line from each other (Attachment 1). The newer drilled well, AKG 340, is to the north in Section 3 and is completed to a depth of 305 feet in bedrock. The well has a 1½ HP submersible pump which pumps at the rate of 20 gpm. 1½-inch PVC pipe diverts water to a 150 gallon Challenger pressure tank which distributes water via 1½-inch PVC to two outside spigots for both hand line and overhead sprinkler irrigation. There will be a drip line connection in the future. The south well in Section 10 is a dug well completed 24 feet deep into glacial drift deposits. The well has a ¾ HP submersible pump which pumps

at the rate of 10 gpm which distributes water via 1-inch PVC pipe to two outside spigots for hand line sprinkler irrigation.

Other Water Rights in the Vicinity

The Department of Ecology Water Right Tracking System (WRTS) database was queried to determine the number of existing water rights within one-half mile of the Varley/Carter wells. An arbitrarily, yet conservatively chosen area of one-half mile is used to define "close proximity". This value is justified experimentally based on current and historical pump test data that show negligible drawdown, and therefore unlikely impairment to wells or surface water diversions, induced by groundwater withdrawal from wells at a distance of 1000 feet in most cases.

There are two ground water rights and two surface water rights that have their points of withdrawal or diversion within a ½ mile radius from the Varley wells. Each of these water rights has their wells or points of diversion at least a ¼ mile away from the Varley wells. The ground water rights have their wells completed in glacial drift. (See Impairment Map Attachment 4)

The water rights are summarized in Table 1 below:

Water Right	Priority Date	Type	Qi (gpm)	Qa (afy)	Purpose of Use
G1-24480CWRIS	04/19/1984	Certificate	5	0.5	Single Domestic
G1-*07598CWRIS	04/30/1965	Certificate	10	3	Irrigation, Single Domestic
S1-00702CWRIS	10/15/1970	Certificate	0.020 cfs	1.250	Irrigation, Wildlife Refuge
S1-27521P	07/21/1994	Permit	0.031 cfs	5.9	Irrigation, Single Domestic

In addition to the water rights listed in Table 1, there are 6 ground water claims and 3 surface water claims within the ½ mile radius. One of the claims is located on the applicant's property, G1-042163CL, which is for 4 gpm and 6.75 acre-feet per-year for irrigation. If this claim is determined to be valid in a future adjudication of water rights, then the portion of the water right equal to this claim will be considered non-additive for both instantaneous pumping rate and annual quantity. However, the claim appears to be invalid based on the year 1952 claimed first put to use. A ground water claim must have been put to use by 1945. A water right claim is a statement of the beneficial use of water that occurred prior to the adoption of the surface and ground water codes and is not authorized by a state-issued permit or certificate. The Department of Ecology cannot verify the validity of these claims, as water right claims can only be confirmed in an adjudication by a Washington State Superior Court. Many of the claims represent use under the ground water exemption (RCW 90.44.050) for single domestic use.

Ecology's well log database shows thirty-eight water wells within one-half mile of the Varley/Carter wells. Some of these belong to the certificated and claimed water rights mentioned above. The remainder fall under the ground water exemption.

FINDINGS

Under state law the following four criteria must be met for an application to be approved:

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

Water Availability

There are no regulatory closures or restrictions affecting water availability on Orcas Island, therefore I find water is legally available for this appropriation. The wells have been in use a number of years for domestic use and irrigation of the orchard without impairing any neighboring wells or surface water bodies. Therefore the two well combined instantaneous quantity of 30 gpm is physically available for appropriation.

Mean annual precipitation in the area is from 34 to less than 36 inches per year. Recharge to the ground water system on Orcas Island occurs from percolation of precipitation. Recharge in the area varies from approximately 3 to less than 6.5 inch per year (USGS, 2002). Once infiltrated, ground water generally flows westerly toward West Sound.

The annual quantity of water needed for appropriation was calculated using Crop Irrigation Requirement (CIR) data from the State of Washington Irrigation Guide (WAIG) 1985 and 1992. The CIR used was based on the Olga rain gage on Orcas Island. This gave inches of irrigation water needed above average rainfall observed for this location.

However the CIR formula does not take into account the loss in conveyance from seepage, evaporation and surface runoff. Consequently, Irrigation Efficiency percentages were used from Ecology Water Resources Guidance 1210. For handline sprinkler systems used on the Varley/Carter property, estimates for efficiency are assigned 75%. Adjusting the Crop Irrigation Requirement (CIR) by the efficiency of the irrigation system, the Total Irrigation Requirement (TIR) for the six acres would be approximately 7.7 acre-feet per year. The formula used to account for this is:

$$TIR = \# \text{ acres} \times CIR / CONV / EFF\%$$

Where: $TIR = \text{total irrigation requirement in acre-feet per year}$

$\# \text{ acres} = \text{area irrigated in acres}$

$CIR = \text{crop irrigation requirement needed above precipitation}$

$CONV = \text{conversion factor to change units (12, inches to feet)}$

$EFF\% = \text{application efficiency of irrigation system}$

The applicant has indicated he will use 5½ acres for fruit trees and ½ acre for blueberries. The only CIR data available in the WAIG for fruit trees is for apples; therefore I used the irrigation requirements for apple trees without cover for this part of the overall TIR calculation. There is no CIR data available for blueberries in the WAIG. Therefore I chose to combine this crop with the irrigation requirements for raspberries from the 1992 WAIG since this has the highest CIR.

Crop	Acreage	Irrigation Method	Efficiency	CIR in inches	TIR in afy
Fruit trees	5.5	Hand line sprinklers	75%	11	6.7
Blueberries	0.5	Hand line sprinklers	75%	17.99	1.0
Total					7.7

$$TIR = (5.5 \text{ acres fruit trees})(11 \text{ inches}) / (12 \text{ in/ft}) / 75\% = 6.7 \text{ acre feet}$$

$$TIR = (0.5 \text{ acres blueberries})(17.99 \text{ inches}) / (12 \text{ in/ft}) / 75\% = 1.0 \text{ acre feet}$$

$$TIR = (6.7 \text{ for fruit trees}) + (1 \text{ for blueberries}) = 7.7 \text{ acre feet}$$

In addition single domestic home use is generally 0.30 acre-feet per year in the area.

Total irrigation requirement for all uses: $6.7 + 1.0 + 0.30 = 8$ acre-feet per year.

Impairment Considerations

There are 2 ground water rights and 2 surface water rights, 5 ground water claims and 3 surface water claims and thirty-eight water wells within one-half mile of the Varley/Carter property. John Rose in his hydrogeology review indicated that although the transmissivity of the bedrock aquifer has not been directly measured, it can be inferred from the nature of the bedrock that there would be a steep cone of depression with a small lateral extent from pumping the Varley/Carter wells. Based on this, the distances between points of withdrawal, relatively low pumping rates, and a demonstration of no impairment through use for over twenty years, there will be no impairment of any wells or other water rights in the vicinity.

Beneficial Use

Irrigation and domestic supply are considered to be beneficial under RCW 90.54.020(1).

Public Interest Considerations

No potential for detriment to the public interest could be identified during the investigation of this application.

Consideration of Protests and Comments

No protests were filed against this application.

RECOMMENDATIONS

Based on the above investigation and findings, I recommend the request for a ground water permit be approved in the quantities and within the limitations listed below and subject to the provisions on page 2.

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:

- 30 gpm
- 8 acre-feet per year for irrigation and domestic use

Points of Withdrawal

SE $\frac{1}{4}$ SW $\frac{1}{4}$, Section 3, Township 36 North, Range 2 West, W.M.
NE $\frac{1}{4}$ NW $\frac{1}{4}$, Section 10, Township 36 North, Range 2 West, W.M.

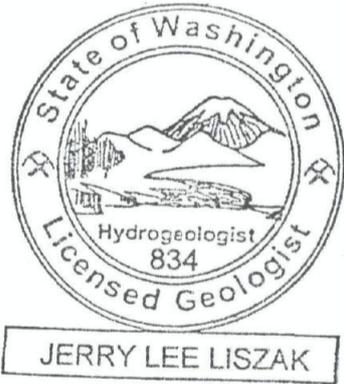
Place of Use

As described in Attachment 2.

CONCLUSIONS

In accordance with chapter 90.03 RCW, I conclude there is water available from the source in question, the purpose of use is beneficial, there will be no impairment of existing rights, and there will be no detriment to the public interest.

Report by: Jerry L. Liszak Date 9/2, 2009
 Jerry L. Liszak, LG, LHG
 Water Resources Program



Licensed Geologist/Hydrogeologist No. 834

If you need this publication in an alternate format, please call the Water Resources Program at (425) 649-7000. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

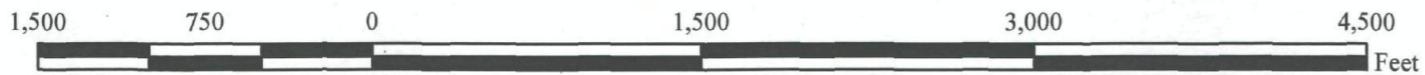
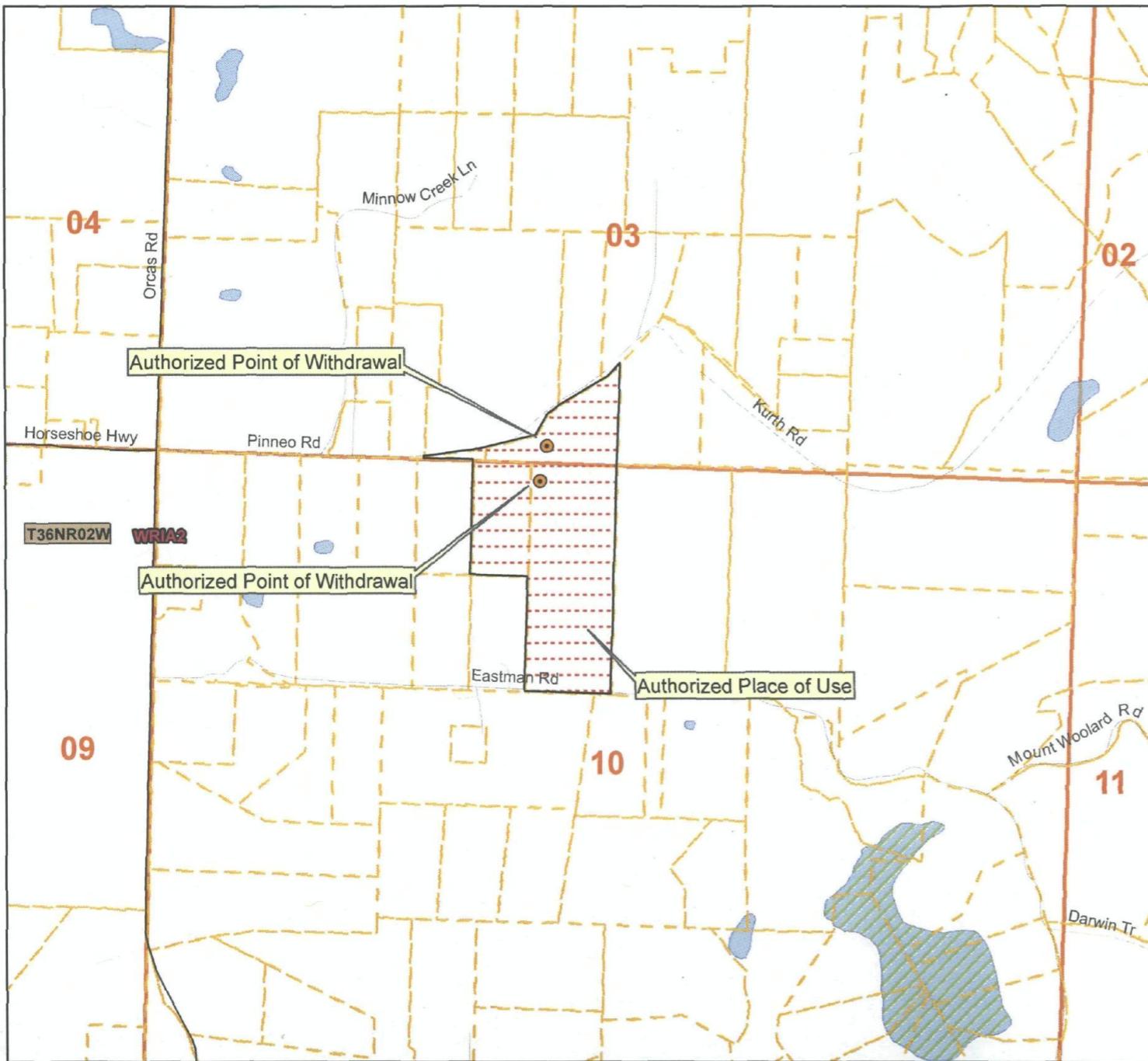
William Varley
 Water Right Number G1-27298
 Sec 03 T 36N R 02W W.M.
 WRIA 2 - San Juan County



Legend

- County
- WRIA
- Highways
- Townships
- cities
- Sections
- Authorized Point of Withdrawal
- Authorized Place of Use

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.'



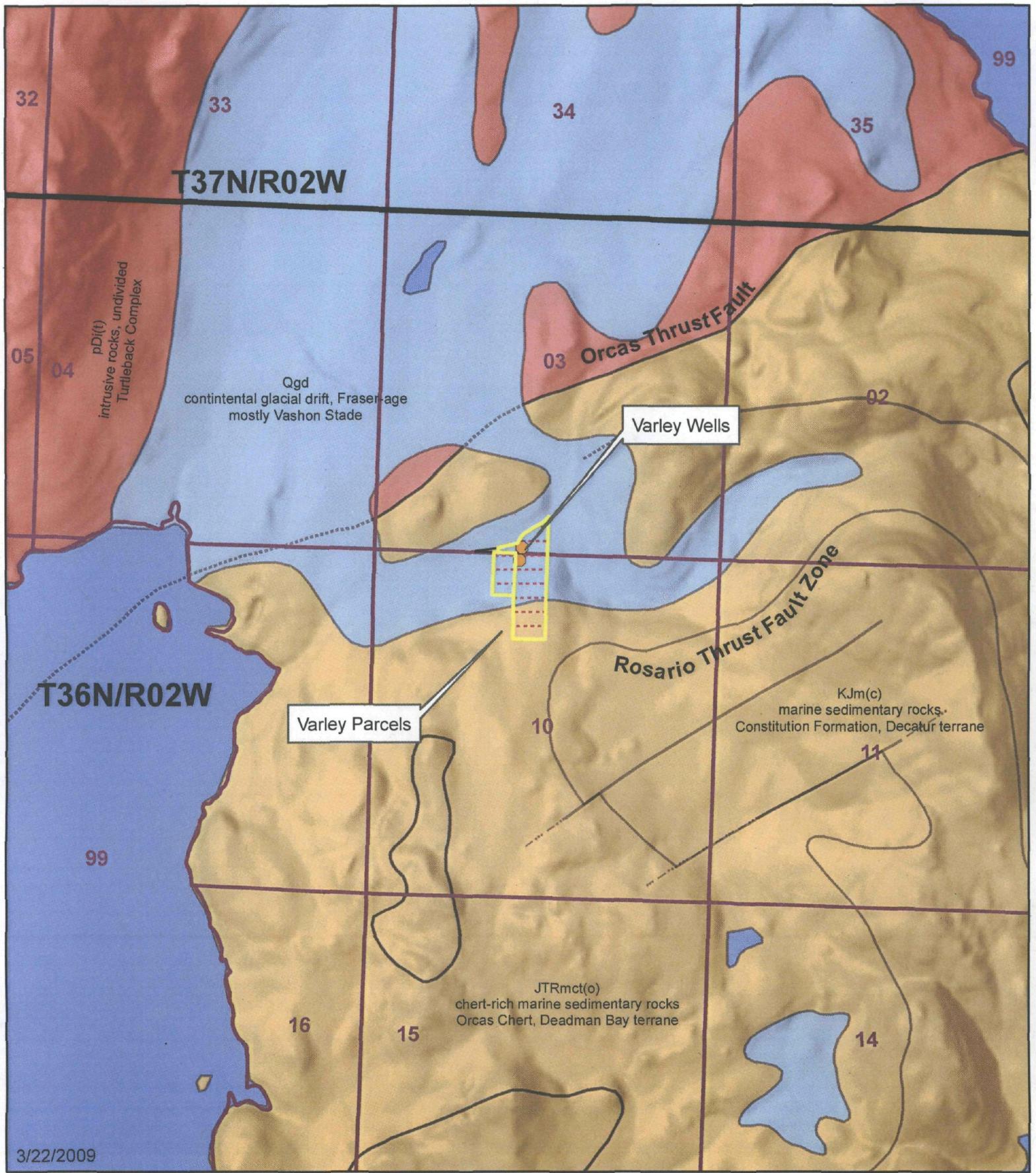
Attachment 1

Attachment 2

Legal description of the Varley/Carter property

Being a portion of section 3 and section 10, Township 36N R 02W described as follows;

Beginning at the NW corner of section 10, Township 36N R02W, thence S88° 02' 56" E 1559.07ft along the north boundary of section 10 to the true point of beginning of said property. Thence N 1° 58' 24" E 12.45ft, thence following the centerline of Pinneo Road N83° 32' 04" E 290.73ft, thence N 76° 42' 56" E 375.09ft, thence N 30° 38' 18" E 138.84ft, thence N50° 57' 23" E 72.68ft thence N59° 44' 34" E 341.26ft, thence N43° 34' 42" E 102.43ft thence leaving the centerline of Pinneo Road, S1° 52' 03" W 1902.66ft thence N88° 34' 56" W 499.16ft thence N1° 42' 02" E 666ft thence N88° 16' 41" W 334.22ft thence N1° 40' 53" E 662.59ft thence N88° 20' 03" W 291.16ft to the true point of beginning.



pD(t)
intrusive rocks, undivided
Turtleback Complex

Qgd
continental glacial drift, Fraser-age
mostly Vashon Stade

03 Orcas Thrust Fault

Rosario Thrust Fault Zone

KJm(c)
marine sedimentary rocks,
Constitution Formation, Decatur terrane

JTRmct(o)
chert-rich marine sedimentary rocks
Orcas Chert, Deadman Bay terrane

T36N/R02W

T37N/R02W

Varley Parcels

Varley Wells

3/22/2009



0 750 1,500 3,000 4,500
Feet

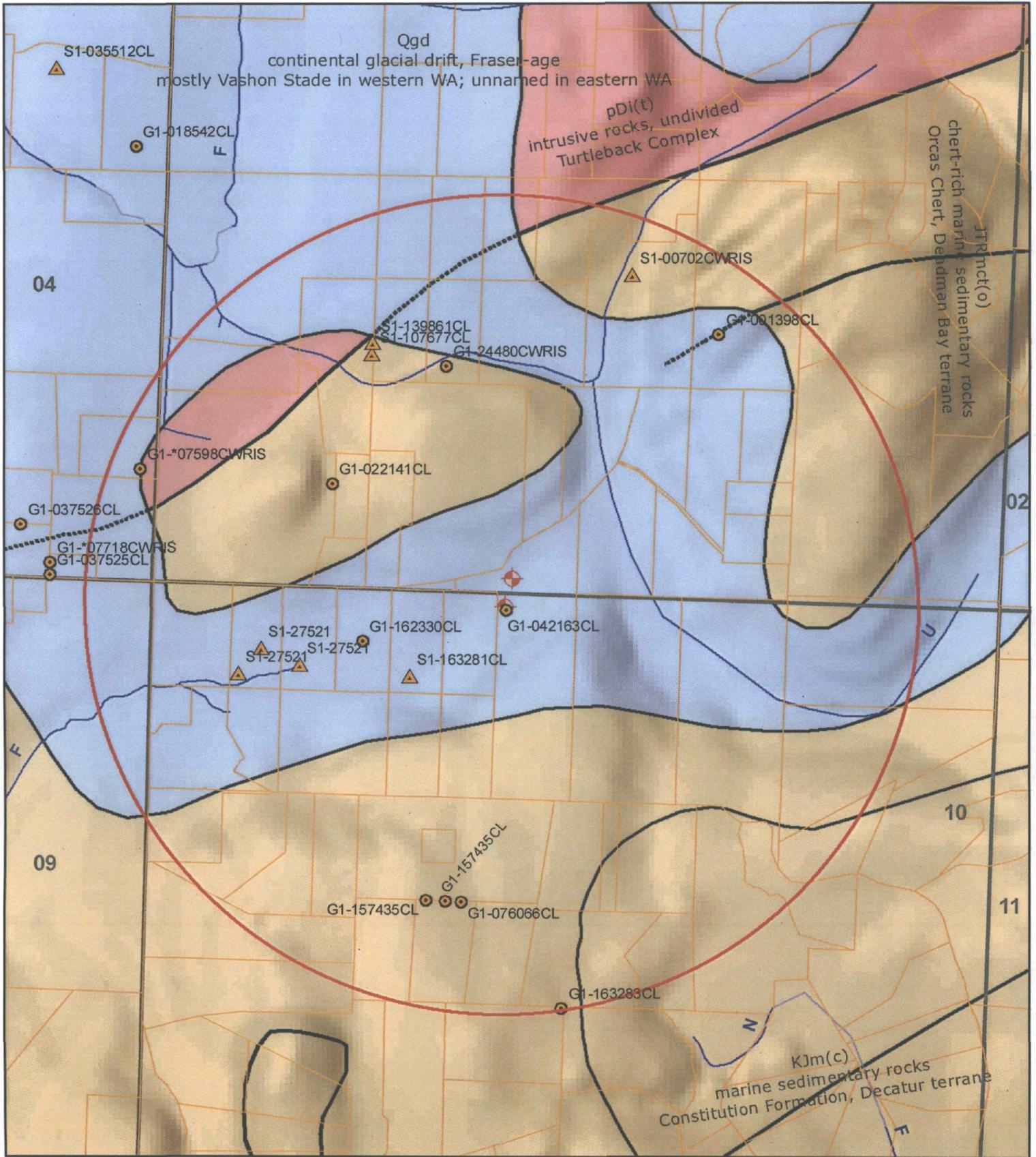
1:24,000

Attachment 3



DEPARTMENT OF
ECOLOGY
State of Washington

**Geology in the vicinity of
Ground Water Application
G1-27298 Varley
San Juan County, Washington**



Attachment 4

1:10,000

0 125 250 500



Yards

- San Juan Parcels 01/16/2009
- ◆ Surveyed Wells of Applicant
- Well
- ▲ Surface Water Diversion



**Water Rights in vicinity
of Water Right Application
G1-27298 Varley
San Juan County, Washington**