Groundwater Application Review Summary Form

Application # G- 18413

GW Reviewer Phil Marcy **Date Review Completed:** 4/13/2017

Summary of GW Availability and Injury Review:

[ ] Groundwater for the proposed use is either over appropriated, will not likely be available in the amounts requested without injury to prior water rights, OR will not likely be available within the capacity of the groundwater resource per Section B of the attached review form.

Summary of Potential for Substantial Interference Review:

[X] There is the potential for substantial interference per Section C of the attached review form.

Summary of Well Construction Assessment:

[ ] The well does not appear to meet current well construction standards per Section D of the attached review form. Route through Well Construction and Compliance Section.

This is only a summary. Documentation is attached and should be read thoroughly to understand the basis for determinations and for conditions that may be necessary for a permit (if one is issued).

WATER RESOURCES DEPARTMENT

MEMO April 13, 2017

TO: **Application G-** 18413

FROM: **GW:** Phil Marcy
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

☐ YES
The source of appropriation is within or above a Scenic Waterway
☒ NO

☐ YES
Use the Scenic Waterway condition (Condition 7J)
☒ NO

☐ Per ORS 390.835, the Groundwater Section is **able** to calculate ground water interference with surface water that contributes to a Scenic Waterway. The calculated interference is distributed below.

☐ Per ORS 390.835, the Groundwater Section is **unable** to calculate ground water interference with surface water that contributes to a scenic waterway; **therefore, the Department is unable to find that there is a preponderance of evidence that the proposed use will measurably reduce the surface water flows necessary to maintain the free-flowing character of a scenic waterway.**

DISTRIBUTION OF INTERFERENCE

Calculate the percentage of consumptive use by month and fill in the table below. If interference cannot be calculated, per criteria in 390.835, do not fill in the table but check the "unable" option above, thus informing Water Rights that the Department is *unable to make a Preponderance of Evidence finding.*

Exercise of this permit is calculated to reduce monthly flows in _____ Scenic Waterway by the following amounts expressed as a proportion of the consumptive use by which surface water flow is reduced.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 04/13/2017

FROM: Groundwater Section Phillip I. Marcy
Reviewer's Name

SUBJECT: Application G- 18413 Supersedes review of
Date of Review(s)

PUBLIC INTEREST PRESUMPTION; GROUNDWATER

OAR 690-310-130 (1) *The Department shall presume that a proposed groundwater use will ensure the preservation of the public welfare, safety and health as described in ORS 537.525.* Department staff review groundwater applications under OAR 690-310-140 to determine whether the presumption is established. OAR 690-310-140 allows the proposed use be modified or conditioned to meet the presumption criteria. **This review is based upon available information and agency policies in place at the time of evaluation.**

A. GENERAL INFORMATION: Applicant's Name: **High Spirit Acres, LLC** County: **Clackamas**

A1. Applicant(s) seek(s) 0.45 cfs from 8 well(s) in the Willamette Basin, Eagle Creek subbasin

A2. Proposed use Nursery Seasonality: Year-round (365 days)

A3. Well and aquifer data **(attach and number logs for existing wells; mark proposed wells as such under logid)**:

Well	Logid	Applicant's Well #	Proposed Aquifer*	Proposed Rate(cfs)	Location (T/R-S QQ-Q)	Location, metes and bounds, e.g. 2250' N, 1200' E fr NW cor S 36
1	Proposed	1	Bedrock	0.45	3S/5E-8 SE-NW	745'N, 335'W fr center S 8
2	Proposed	2	Bedrock	0.45	3S/5E-8 SE-NW	515'N, 450'W fr center S 8
3	Proposed	3	Bedrock	0.45	3S/5E-8 NW-SE	580'S, 580'E fr center S 8
4	Proposed	4	Bedrock	0.45	3S/5E-8 NW-SE	395'S, 720'E fr center S 8
5	Proposed	5	Bedrock	0.45	3S/5E-8 NW-SE	290'S, 1050'E fr center S 8
6	Proposed	6	Bedrock	0.45	3S/5E-8 SW-SE	1455'S, 235'E fr center S 8
7	Proposed	7	Bedrock	0.45	3S/5E-8 NW-SE	1305'S, 465'E fr center S 8
8	Proposed	8	Bedrock	0.45	3S/5E-8 SW-SE	1460'S, 525'E fr center S 8

* Alluvium, CRB, Bedrock

Well	Well Elev ft msl	First Water ft bls	SWL ft bls	SWL Date	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Draw Down (ft)	Test Type
1	1256	NA	NA	NA	500-600	0-50	0-50	Unknown	TBD	NA	NA	NA
2	1244	NA	NA	NA	450-550	0-50	0-50	Unknown	TBD	NA	NA	NA
3	1159	NA	NA	NA	450-550	0-50	0-50	Unknown	TBD	NA	NA	NA
4	1161	NA	NA	NA	500-600	0-50	0-50	Unknown	TBD	NA	NA	NA
5	1144	NA	NA	NA	400-500	0-50	0-50	Unknown	TBD	NA	NA	NA
6	1173	NA	NA	NA	450-550	0-50	0-50	Unknown	TBD	NA	NA	NA
7	1192	NA	NA	NA	450-550	0-50	0-50	Unknown	TBD	NA	NA	NA
8	1164	NA	NA	NA	300-400	0-50	0-50	Unknown	TBD	NA	NA	NA

Use data from application for proposed wells.

A4. **Comments:** The applicant proposes eight well locations, each producing from "Volcanics" at depths ranging from 300-600 feet. The casing and seal depths proposed are much shallower than the total well depths proposed, which unless solid rock is encountered in the shallow subsurface, will likely open the wells to production from more than one water-bearing lithology. The total requested rate is 200 gpm from all wells, but no dedicated rate is given for each well so this review will evaluate each well at the full rate.

A5. ☒ **Provisions of the** Willamette Basin rules relative to the development, classification and/or management of groundwater hydraulically connected to surface water ☐ **are**, *or* ☒ **are not**, activated by this application. (Not all basin rules contain such provisions.)
Comments: The proposed POA locations and their proposed construction targets water-bearing zones that are unlikely to discharge within ¼ mile, thus do not trigger Willamette Basin rules concerning GW-SW connection.

A6. ☐ **Well(s) #** _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.
Name of administrative area:
Comments:

B. GROUNDWATER AVAILABILITY CONSIDERATIONS, OAR 690-310-130, 400-010, 410-0070

B1. **Based upon available data**, I have determined that groundwater* for the proposed use:

a. ☐ **is** over appropriated, ☐ **is not** over appropriated, *or* ☒ **cannot be determined to be** over appropriated during any period of the proposed use. * This finding is limited to the groundwater portion of the over-appropriation determination as prescribed in OAR 690-310-130;

b. ☐ **will not** *or* ☐ **will** likely be available in the amounts requested without injury to prior water rights. * This finding is limited to the groundwater portion of the injury determination as prescribed in OAR 690-310-130;

c. ☐ **will not** *or* ☐ **will** likely to be available within the capacity of the groundwater resource; or

d. ☒ **will, if properly conditioned**, avoid injury to existing groundwater rights or to the groundwater resource:
   i. ☒ The permit should contain condition #(s) 7N; "Medium Water Use Reporting"
   ii. ☐ The permit should be conditioned as indicated in item 2 below.
   iii. ☐ The permit should contain special condition(s) as indicated in item 3 below;

B2. a. ☐ **Condition** to allow groundwater production from no deeper than _____ ft. below land surface;

b. ☐ **Condition** to allow groundwater production from no shallower than _____ ft. below land surface;

c. ☐ **Condition** to allow groundwater production only from the _____ groundwater reservoir between approximately_____ ft. and_____ ft. below land surface;

d. ☐ **Well reconstruction** is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Groundwater Section.

Describe injury –as related to water availability– that is likely to occur without well reconstruction (interference w/ senior water rights, not within the capacity of the resource, etc): _____

B3. **Groundwater availability remarks:** The area surrounding the proposed POA locations is mapped as Boring Volcanic Field lavas (Sherrod, 2000), overlying older Rhododendron Formation rocks of the Western Cascades, and deposits of Sandy River Mudstone to the west (Madin, 2004). It appears that deeper wells in this area penetrate all three of these units, and produce water primarily from the Rhododendron Formation (see CLAC 1687).

There is little recent water level data available for this aquifer in the area surrounding the proposed POA locations. CLAC 1620 is located between 3000-5500 feet NW of given POA locations, and produces groundwater from the Rhododendron Formation. The hydrograph for this well shows stable water levels for more than two decades, followed by a decline of close to ten feet between 2011 and 2016 (see attached hydrograph). This decline coincides with extreme drought in the Willamette Basin, however, and may not indicate a long-term decline due to excessive groundwater pumping.

C. GROUNDWATER/SURFACE WATER CONSIDERATIONS, OAR 690-09-040

C1. **690-09-040 (1):** Evaluation of aquifer confinement:

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	**Rhododendron Formation**	☒	☐
2	**Rhododendron Formation**	☒	☐
3	**Rhododendron Formation**	☒	☐
4	**Rhododendron Formation**	☒	☐
5	**Rhododendron Formation**	☒	☐
6	**Rhododendron Formation**	☒	☐
7	**Rhododendron Formation**	☒	☐
8	**Rhododendron Formation**	☒	☐

Basis for aquifer confinement evaluation: A survey of well log reports in 3S/5E, section 8 displays that wells completed between 450-600' have reported head elevations well above the depth of each well (see attached figure). A closer look at these logs confirms that the water-bearing zones are typically deeper than their resultant static water levels (CLAC 1687, CLAC 12257, CLAC 63444). This confinement is likely localized, however, controlled by the rate at which groundwater can be discharged to local drainages which incise the Rhododendron Formation in the area.

C2. **690-09-040 (2) (3):** Evaluation of distance to, and hydraulic connection with, surface water sources. All wells located a horizontal distance less than ¼ mile from a surface water source that produce water from an unconfined aquifer shall be assumed to be hydraulically connected to the surface water source. Include in this table any streams located beyond one mile that are evaluated for PSI.

Well	SW #	Surface Water Name	GW Elev ft msl	SW Elev ft msl	Distance (ft)*	Hydraulically Connected? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	1	**N. Fork Eagle Creek**	~900	~900	2380	☒	☐	☐	☐	☒
2	1	**N. Fork Eagle Creek**	~900	~900	2100	☒	☐	☐	☐	☒
3	1	**N. Fork Eagle Creek**	~900	~900	2280	☒	☐	☐	☐	☒
4	1	**N. Fork Eagle Creek**	~900	~900	2490	☒	☐	☐	☐	☒
5	1	**N. Fork Eagle Creek**	~900	~900	2800	☒	☐	☐	☐	☒
6	1	**N. Fork Eagle Creek**	~900	~900	1800	☒	☐	☐	☐	☒
7	1	**N. Fork Eagle Creek**	~900	~900	2020	☒	☐	☐	☐	☒
8	1	**N. Fork Eagle Creek**	~900	~900	2100	☒	☐	☐	☐	☒
1	2	**Unn trib to N Fk Eagle Ck**	~900	~900	3800	☒	☐	☐	☐	☒
2	2	**Unn trib to N Fk Eagle Ck**	~900	~900	3620	☒	☐	☐	☐	☒
3	2	**Unn trib to N Fk Eagle Ck**	~900	~900	4450	☒	☐	☐	☐	☒
4	2	**Unn trib to N Fk Eagle Ck**	~900	~900	4650	☒	☐	☐	☐	☒
5	2	**Unn trib to N Fk Eagle Ck**	~900	~900	4900	☒	☐	☐	☐	☒
6	2	**Unn trib to N Fk Eagle Ck**	~900	~900	4180	☒	☐	☐	☐	☒
7	2	**Unn trib to N Fk Eagle Ck**	~900	~900	4350	☒	☐	☐	☐	☒
8	2	**Unn trib to N Fk Eagle Ck**	~900	~900	4400	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: *Distances used for SW-GW evaluation are from the point at which the surface water body intersects the likely groundwater elevation.

The Rhododendron Formation consists of localized lava flows, interbedded with tuff breccias, mudflow breccias, and various clastic sediment packages. Hydraulic conductivity within these interfingering, complex deposits is generally low. It is likely that groundwater elevations are a muted expression of local topography, with localized confinement expressed in more permeable lithologies within the formation. None of the POA locations are within one-quarter mile of the likely discharge point of the local aquifer system.

Water Availability Basin the well(s) are located within: North Fork Eagle Creek > Eagle Creek – At Mouth (ID# 138)

C3a. **690-09-040 (4):** Evaluation of stream impacts for each well that has been determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that surface water source, and not lower SW sources to which the stream under evaluation is tributary. Compare the requested rate against the 1% of 80% *natural* flow for the pertinent Water Availability Basin (WAB). If Q is not distributed by well, use full rate for each well. Any checked ☒ box indicates the well is assumed to have the potential to cause PSI.

Well	SW #	Well < ¼ mile?	Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
1	1	☐	☐	MF138A	10	☒	3.45	☒	<<25%	☒
2	1	☐	☐	MF138A	10	☒	3.45	☒	<<25%	☒
3	1	☐	☐	MF138A	10	☒	3.45	☒	<<25%	☒
4	1	☐	☐	MF138A	10	☒	3.45	☒	<<25%	☒
5	1	☐	☐	MF138A	10	☒	3.45	☒	<<25%	☒
6	1	☐	☐	MF138A	10	☒	3.45	☒	<<25%	☒
7	1	☐	☐	MF138A	10	☒	3.45	☒	<<25%	☒
8	1	☐	☐	MF138A	10	☒	3.45	☒	<<25%	☒
1	2	☐	☐			☐	3.45	☒	<<25%	☒
2	2	☐	☐			☐	3.45	☒	<<25%	☒
3	2	☐	☐			☐	3.45	☒	<<25%	☒
4	2	☐	☐			☐	3.45	☒	<<25%	☒
5	2	☐	☐			☐	3.45	☒	<<25%	☒
6	2	☐	☐			☐	3.45	☒	<<25%	☒
7	2	☐	☐			☐	3.45	☒	<<25%	☒
8	2	☐	☐			☐	3.45	☒	<<25%	☒

C3b. **690-09-040 (4):** Evaluation of stream impacts by total appropriation for all wells determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. **Complete only if Q is distributed among wells**. Otherwise same evaluation and limitations apply as in C3a above.

	SW #		Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
			☐			☐		☐		☐
			☐			☐		☐		☐
			☐			☐		☐		☐
			☐			☐		☐		☐

Comments: The requested pumping rate is 0.45 CFS, which is greater than 1% of the instream water right (ISWR) on Eagle Creek (0.1 CFS), as well as being greater than 1% of 80% of the Natural Flow within this WAB (0.0345 CFS). Impacts to local streams within the first 30 days of pumping are expected to be much less than 25% of the pumping rate, based upon modeling results in similar environments. Though the complexity of interbedded lithologies within the Rhododendron Formation render modeling efforts difficult, the preponderance of fine-grained lithologies here, in addition to fine-grained deposits lining local streambeds significantly delay the impacts of pumping groundwater on these streams.

C4a. **690-09-040 (5):** Estimated impacts on **hydraulically connected surface water sources greater than one mile** as a percentage of the proposed pumping rate. Limit evaluation to the effects that will occur up to one year after pumping begins. This table encompasses the considerations required by 09-040 (5)(a), (b), (c) and (d), which are not included on this form. Use additional sheets if calculated flows from more than one WAB are required.

Non-Distributed Wells

Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													

Distributed Wells

Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													

	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS												
Interference CFS												
	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS												
Interference CFS												
	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS												
Interference CFS												
	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS												
Interference CFS												
(A) = Total Interf.												
(B) = 80 % Nat. Q												
(C) = 1 % Nat. Q												
(D) = (A) > (C)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100	%	%	%	%	%	%	%	%	%	%	%	%

(A) = total interference as CFS; (B) = WAB calculated natural flow at 80% exceed. as CFS; (C) = 1% of calculated natural flow at 80% exceed. as CFS; (D) = highlight the checkmark for each month where (A) is greater than (C); (E) = total interference divided by 80% flow as percentage.

Basis for impact evaluation: This section does not apply.

C4b. **690-09-040 (5) (b) The potential to impair or detrimentally affect the public interest is to be determined by the Water Rights Section.**

C5. ☐ **If properly conditioned**, the surface water source(s) can be adequately protected from interference, and/or groundwater use under this permit can be regulated if it is found to substantially interfere with surface water:

i. ☐ The permit should contain condition #(s)_____;

ii. ☐ The permit should contain special condition(s) as indicated in "Remarks" below;

C6. **SW / GW Remarks and Conditions:**

References Used:

Sherrod, D. R., and Smith, J. G., 2000, Geologic map of Upper Eocene to Holocene Volcanic and Related Rocks of the Cascade Range, Oregon: Reston, Va., U.S. Geological Survey, Interpretive Map I-2569, sheet 1, map scale 1:500,000.

Madin, I.P., 2004, Geologic Mapping & Database for Portland area fault studies: Final report, Clackamas, Multnomah & Washington Counties, OR, Open File Report O-04-02, Oregon Department of Geology and Mineral Industries, Portland, OR., map scale 1:24,000

Application file G-18413, local well logs, USGS topo maps.

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #:** _____ **Logid:** _____

D2. **THE WELL does not appear to meet current well construction standards based upon:**

a. ☐ review of the well log;
b. ☐ field inspection by _____;
c. ☐ report of CWRE _____;
d. ☐ other: (specify) _____

D3. **THE WELL construction deficiency or other comment is described as follows:** _____

D4. ☐ **Route to the Well Construction and Compliance Section for a review of existing well construction.**

Water Availability Tables

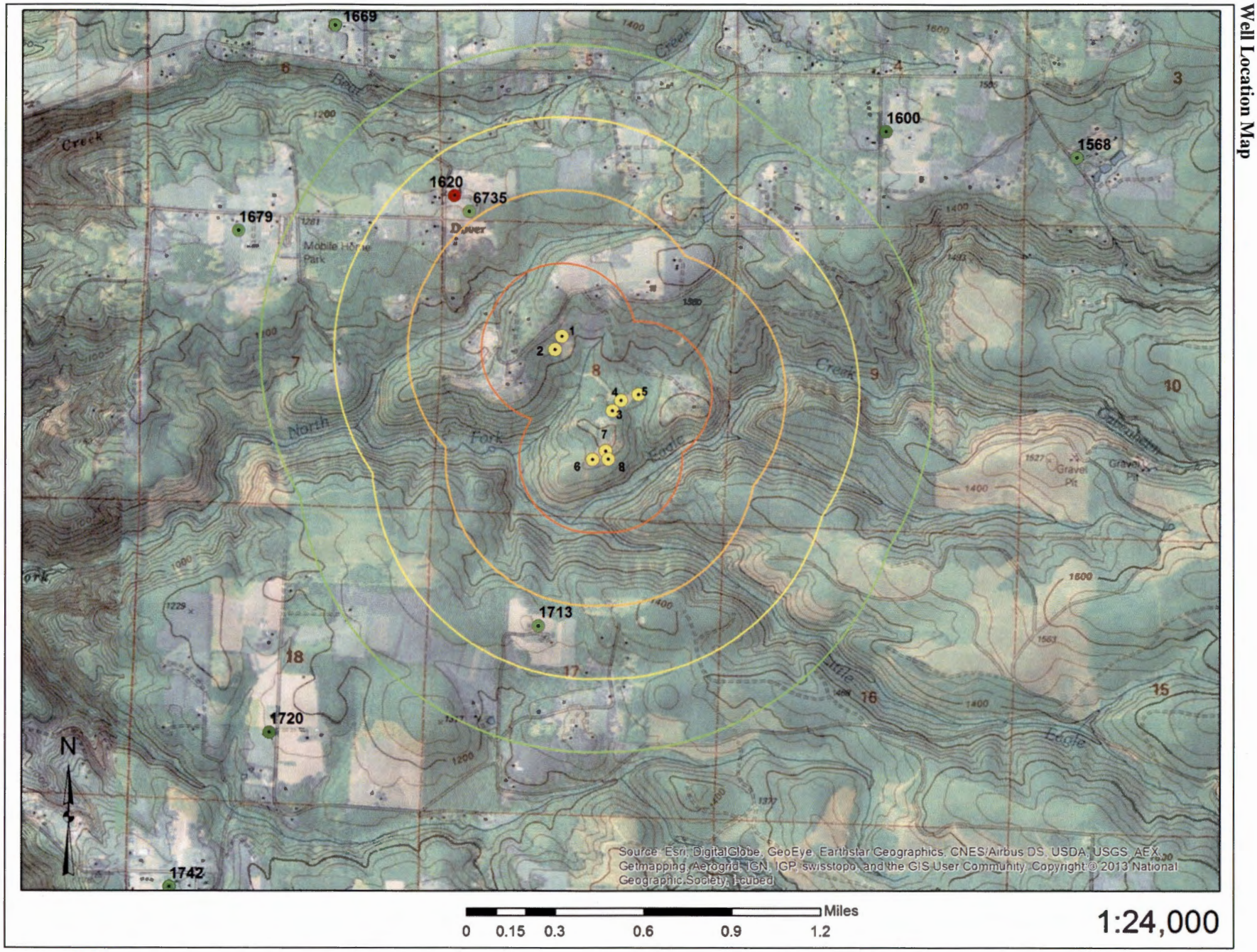
DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

N FK EAGLE CR > EAGLE CR - AT MOUTH

Watershed ID #: 138 Basin: WILLAMETTE Exceedance Level: 80

Time: 4:34 PM Date: 04/12/2017

Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
			Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.			
JAN	68.70	0.07	68.60	0.00	45.00	23.60
FEB	69.70	0.05	69.60	0.00	45.00	24.60
MAR	70.80	0.03	70.80	0.00	45.00	25.80
APR	75.70	0.05	75.70	0.00	45.00	30.70
MAY	68.90	0.10	68.80	0.00	45.00	23.80
JUN	30.90	0.15	30.70	0.00	30.00	0.75
JUL	12.10	0.27	11.80	0.00	20.00	-8.17
AUG	5.14	0.22	4.92	0.00	10.00	-5.08
SEP	3.45	0.08	3.37	0.00	10.00	-6.63
OCT	4.75	0.02	4.73	0.00	10.00	-5.27
NOV	19.60	0.03	19.60	0.00	45.00	-25.40
DEC	66.70	0.08	66.60	0.00	45.00	21.60
ANN	57,000	70	57,000	0	23,800	34,000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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community. Copyright © 2013 National Geographic Society, i-cubed
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Water-Level Trends in Nearby Wells