

Approved:



## MEMO

**To:** Kristopher Byrd, Well Construction Section Manager  
**From:** Tommy Laird, Well Construction Program Coordinator  
**Subject:** Review of Water Right Application G-19197  
**Date:** October 19, 2023

The attached application was forwarded to the Well Construction Section by the Groundwater Section. Travis Brown and Gabriela Ferreira reviewed the application. Please see Travis' and Gabriela's Groundwater Review.

Applicant's Option Well #1 (Proposed Well): Well #1 is a proposed well, therefore it cannot be reviewed for construction. Construction of this proposed well shall be completed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240. During construction of this well, specific attention should be paid to ensure sealing requirements are met and that the well does not commingle aquifers.

The construction of proposed Option Well #1 may not satisfy hydraulic connection issues.

Applicant's Option Well #2 (Proposed Well): Well #2 is a proposed well, therefore it cannot be reviewed for construction. Construction of this proposed well shall be completed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240. During construction of this well, specific attention should be paid to ensure sealing requirements are met and that the well does not commingle aquifers.

The construction of proposed Option Well #2 may not satisfy hydraulic connection issues.

# Groundwater Application Review Summary Form

Application # G- 19197

GW Reviewer Travis Brown / Gabriela Ferreira Date Review Completed: 2/1/2023

## 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:

☒ 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

February 1, 2023

TO: Application G- 19197

FROM: GW: Travis Brown / Gabriela Ferreira  
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

- ☐ YES      The source of appropriation is hydraulically connected to a State Scenic Waterway or its tributaries
- ☒ 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 [Enter] 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 2/1/2023  
 FROM: Groundwater Section Travis Brown / Gabriela Ferreira  
 Reviewer's Name  
 SUBJECT: Application G- 19197 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: Emily and Austin Booth County: Clackamas

A1. Applicant(s) seek(s) 0.13 cfs from 1 well(s) in the Willamette Basin,  
 \_\_\_\_\_ subbasin

A2. Proposed use Nursery (2.5 acres) Seasonality: April - October

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    | <b>PROPOSED</b> | Option 1           | CRB               | 0.13 <sup>a</sup>  | 3S/1E-26 NW-SW        | 2232' N, 151' E fr SW cor S26                                    |
| 2    | <b>PROPOSED</b> | Option 2           | CRB               | 0.13 <sup>a</sup>  | 3S, 1E, NW-SW         | 1855' N, 81' E from SW cor S26                                   |

\* 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    | 223 <sup>b</sup> | TBD                | TBD        | TBD      | 300             | 140                | 140                   | TBD                  | TBD                          | 60               | TBD            | TBD       |
| 2    | 205 <sup>b</sup> | TBD                | TBD        | TBD      | 300             | 140                | 140                   | TBD                  | TBD                          | 60               | TBD            | TBD       |

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU is approximately 0.3 mile east of the city limits of Canby, Oregon. Applicant proposes irrigation of 2.5 acres for nursery production. Applicant proposes two locations for evaluation, final construction will consist of one well.

<sup>a</sup>In Section 3, Applicant proposes 60 gpm as the well-specific rate and an annual volume of 9 acre-feet. The maximum applicable duty for containerized nursery use is 5 acre-feet per acre. The proposed POA will be assessed at a total rate of 0.13 cfs and a maximum applicable duty for nursery use of 12.5 acre-feet.

<sup>b</sup>Land surface elevation from LIDAR at the proposed well site (OLC, 2016)

\*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 is greater than ¼-mile from the nearest surface water source and will develop a confined aquifer; therefore, per OAR 690-502-0160 the relevant Willamette Basin rules (OAR 690-502-0050) do not apply.

A6. ☐ **Well(s) #** \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, tap(s) an aquifer limited by an administrative restriction.  
 Name of administrative area: N/A  
 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) 7i (Willamette Basalt Condition), large 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 Columbia River Basalt 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 proposed POA is located within the Columbia River Basalt Group (CRBG/CRB) Miocene-aged flood-lavas, which consist of a series of layered basalt flows ranging in thickness from 10 to 100 feet. Basalt outcrops at the surface near Oregon City and west of the Willamette River from the POA. Relatively permeable and productive interflow zones are encountered between layers of basalt flows, separated by low-permeability dense interior that act as confining beds. As such, the CRBG aquifer has relatively low storage capacity (bulk porosity estimated to average 3%) and withdrawal from CRBG aquifers can quickly impact nearby wells. The CRBG is overlain by basin-fill deposits, estimated to be approximately 40 to 60 feet in thickness based on nearby wells (CLAC 9687 and CLAC 9665). Different interflow zones have widely variable production rates (as observed in CLAC 9621), typically attributed to the amount of erosion and vesiculation in the interflow zones. (Leonard and Collins 1983; Gannett & Caldwell, 1998)

Median yield for nearby wells producing from the basalt aquifer was 35 gallons per minute and ranged from 10 to 300 gpm (see attached well statistics). The requested rate of 60 gpm appears reasonable based on nearby well data. The nearest groundwater user (CLAC 9687) is approximately 500 feet southwest of the proposed POA. CLAC 9687 is an exempt domestic well completed to a depth of 182 feet below land surface (bls) with open annular space from 40 to 182 feet bls; static water level at the time of drilling was 106 feet bls in 1968. The attached Theis drawdown analysis models potential impacts on CLAC 9687 assuming the full duty and rate of the proposed POA. Transmissivity values are based on pump tests from nearby basalt wells. At the lowest observed transmissivity (48 ft<sup>2</sup>/day), drawdown exceeds 15 feet; however, drawdown is less than 15 feet for the median and highest reviewed transmissivity values. It appears unlikely that interference in excess

of the typical permit condition limits (Condition 7i) would occur at CLAC 9687 as a result of the requested withdrawal.

The attached hydrographs provide water level data for nearby CRBG wells. Long-term water level data is available from CLAC 9648 (open hole 173 – 230 feet bls, SWL = 99 feet bls), dating back to 1954. Some decline is observed in the 1990's through 2000's with recent increase in the past two years, although the recent measurements were not static (total decline ~ 17 feet). CLAC 65581 indicates some slight decline since installation in 2008 (total decline ~ 4 feet). Well deepenings are not prevalent. Individual water-bearing zones within the basalt aquifer system that are hydraulically disconnected from surface water sources will likely experience water level declines over time, as the only source of water to wells pumping these zones comes from storage. However, given the available evidence, it cannot be stated with reasonable certainty that declines in the basalt aquifer system in this area are persistent or widespread at this time. Based on the above information, the groundwater resource is not over appropriated at this time.

**However, in order to protect senior users and the resource, the conditions listed in Items B1(d)(i) and (iii), above, as well as the following Special Conditions are strongly recommended for any permit issued pursuant to this application.**

**Special Conditions:**

- A. Each basalt well shall be open to a single aquifer of the Columbia River Basalt Group and shall meet the applicable well construction standards (OAR 690-200 and OAR 690-210).

In addition, the open interval in each well shall be no greater than 100 feet. An open interval of greater than 100 feet may be allowed if substantial evidence of a single aquifer completion can be demonstrated to the satisfaction of the Department Hydrogeologists, using information from a video log, downhole flowmeter, water chemistry and temperature, or other downhole geophysical methods. These methods shall characterize the nature of the basalt rock and assess whether water is moving in the borehole. Any discernable movement of water within the well bore when the well is not being pumped shall be assumed as evidence of the presence of multiple aquifers in the open interval.

If during well construction, it becomes apparent that the well can be constructed to eliminate the commingling of aquifers and/or interference with hydraulically connected streams in a manner other than specified in this permit, the permittee can contact the Department Hydrogeologist for this permit or the Groundwater Section Manager to request approval of such construction. The request shall be in writing and shall include a rough well log and a proposed construction design for approval by the Department. The request can be approved only if it is received and reviewed prior to placement of any permanent casing and sealing material. If the request is made after casing and seal are placed, the requested modification will not be approved. If approved, the new well depth and construction specifications will be incorporated into any certificate issued for this permit.

- B. A dedicated water level measuring tube shall be installed in each well. The measuring tube shall meet the standards described in OAR 690-215-0060. When requested, access to the wells shall be provided to Department staff in order to make water level measurements.
- C. For any wells constructed under this or subsequent permits, the permittee shall coordinate with the driller to ensure that drill cuttings are collected at 10-foot intervals and at changes in formation in each well. A split of each sampled interval shall be provided to the Department.
- D. If any geologic and hydrogeologic reports are completed for the permittee during the development of permitted wells, including geophysical well logs and borehole video logs, then copies of the reports shall be provided to the Department. Except for borehole video logs, two paper copies or a single electronic copy shall be provided of each report. Digital tables of any data shall be provided upon request.

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**NOTE: As currently proposed (seal to 140 ft bls, total depth of 300 ft bls), the construction of the POA would violate Special Condition A (open interval no greater than 100 ft) as the proposed open interval would be ~160 ft bls. The applicant should plan to modify the proposed well construction to ensure an open interval of no more than 100 ft or should plan to collect additional evidence (downhole flowmeter, water levels, etc.) to demonstrate a single aquifer completion.**

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**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    | CRB                         | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2    | CRB                         | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

**Basis for aquifer confinement evaluation:** Nearby wells completed in CRB report SWLs above the water-bearing zone(s), indicating a confined aquifer or series of aquifers.

**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<br>ft msl   | SW Elev<br>ft msl   | Distance<br>(ft) | Hydraulically Connected?            |                                     |                          | Potential for Subst. Interfer. Assumed? |                                     |
|------|------|--------------------|---------------------|---------------------|------------------|-------------------------------------|-------------------------------------|--------------------------|-----------------------------------------|-------------------------------------|
|      |      |                    |                     |                     |                  | YES                                 | NO                                  | ASSUMED                  | YES                                     | NO                                  |
| 1    | 1    | Willamette River   | 75-100 <sup>a</sup> | 58-61 <sup>b</sup>  | 1,530            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>                | <input checked="" type="checkbox"/> |
| 2    | 1    | Willamette River   | 75-100 <sup>a</sup> | 58-61 <sup>b</sup>  | 1,820            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>                | <input checked="" type="checkbox"/> |
| 1    | 2    | Parrott Creek      | 75-100 <sup>a</sup> | 91-110 <sup>b</sup> | 3,833            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>                | <input type="checkbox"/>            |
| 2    | 2    | Parrott Creek      | 75-100 <sup>a</sup> | 91-110 <sup>b</sup> | 4,109            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>                | <input type="checkbox"/>            |

**Basis for aquifer hydraulic connection evaluation:** Basalt aquifers have primarily horizontal flow with dense flow interiors that prevent significant vertical migration. Nearby well logs (CLAC 9621, CLAC 9665, CLAC 9687) indicate water-bearing zones within the CRB starting at ~25 to 0 ft amsl. The Willamette River, the deepest of the nearby streams, appears to have incised down to a level of ~6 ft amsl (USGS, 1961). The proposed well construction (casing and seal to 140 ft bls) would leave the POA wells open from ~83 ft amsl (Well 1) or ~65 ft amsl (Well 2) downward. Nearby wells completed in the CRB indicate water level elevations between 59 and 109 feet amsl, significantly above the surface water elevation of the Willamette River. Given the available evidence, it appears likely that there is hydraulic connection between the shallowest water-bearing zones within the CRB aquifer system and the Willamette River. However, deeper water-bearing zones (those below ~ -20 ft msl) are unlikely to be hydraulically connected to the Willamette River due to overlying dense basalt flow interiors, the extremely low permeability of which will severely inhibit vertical flow of groundwater. If constructed as proposed in the application, the POA would likely have hydraulic connection with the Willamette River. If, however, the POA were cased and sealed to a greater depth (at least -20 ft amsl), these wells would not likely be hydraulically connected to the Willamette River.

Due to the higher elevation of the Parrott Creek streambed (~90 to 110 ft amsl), it is unlikely to be hydraulically connected to even shallow water-bearing zones within the CRB aquifer system, as dense, low permeability basalt flow interiors and fine-grained basin fill sediments separate the streambed and these water-bearing zones.

<sup>a</sup> Groundwater level elevation estimated from nearby wells (CLAC 9550, 9648, 9687, 65581) and published data (Conlon et al., 2005).

<sup>b</sup> Stream surface elevation from LIDAR within 1 mile of the proposed POA (OLC, 2016)

**Water Availability Basin the well(s) are located within:** **WID# 181, WILLAMETTE R > COLUMBIA R – AT MOUTH**

**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 (SW) source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that SW source, 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    | <input type="checkbox"/> | <input type="checkbox"/> | MF181                   | 1500                         | <input type="checkbox"/> | 4,890                  | <input type="checkbox"/>     | >25%                       | <input checked="" type="checkbox"/>     |
| 2    | 1    | <input type="checkbox"/> | <input type="checkbox"/> | MF181                   | 1500                         | <input type="checkbox"/> | 4,890                  | <input type="checkbox"/>     | >25%                       | <input checked="" type="checkbox"/>     |

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 # |  | Q <sub>w</sub> > 5 cfs?  | Instream Water Right ID | Instream Water Right Q (cfs) | Q <sub>w</sub> > 1% ISWR? | 80% Natural Flow (cfs) | Q <sub>w</sub> > 1% of 80% Natural Flow? | Interference @ 30 days (%) | Potential for Subst. Interfer. Assumed? |
|--|------|--|--------------------------|-------------------------|------------------------------|---------------------------|------------------------|------------------------------------------|----------------------------|-----------------------------------------|
|  |      |  | <input type="checkbox"/> |                         |                              | <input type="checkbox"/>  |                        | <input type="checkbox"/>                 |                            | <input type="checkbox"/>                |
|  |      |  | <input type="checkbox"/> |                         |                              | <input type="checkbox"/>  |                        | <input type="checkbox"/>                 |                            | <input type="checkbox"/>                |

**Comments:** The Hunt (1999) analytical model was used to estimate the anticipated interference with surface water due to the proposed use. Hydraulic parameters used for the analysis were derived from regional data and studies (Pumping Test Reports; Conlon et al., 2003, 2005; Iverson, 2002; McFarland and Morgan, 1996; Woodward et al., 1998) or are within a typical range of values for the given parameter within the hydrogeologic regime (Domenico and Mifflin, 1965; Freeze and Cherry, 1979).

**Results of the analysis indicate that interference with the Willamette River (SW1) is likely to exceed 25 percent of the pumping rate within the first 30 days of continuous pumping based on the proposed well construction (see attached Stream Depletion Analysis). Per OAR 690-009-0040(4)(d), the Potential for Substantial Interference (PSI) with the Willamette River is assumed. NOTE: This result is based off the proposed well construction (case and seal to ~140 ft bls) and the presence of shallow water-bearing zones within the CRB aquifer system through which the Willamette River appears to have incised (see discussion in C2, above). Extending the casing and seal to seal off these shallow water-bearing zones would preclude hydraulic connection and, thereby, preclude the finding of PSI between the proposed POA and the Willamette River.**

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      |     |     |     |     |     |     |     |     |     |     |     |     |     |
| (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:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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:** **PSI between the proposed POA and the Willamette River was assumed per OAR 690-009-0040(4)(d) through the shallow water-bearing zones within the CRB. However, based on the water availability analysis for this Water Availability Basin, water does appear to be available for additional appropriation (see attached Water Availability Table). Furthermore, the proposed use (nursery) is allowed under the Willamette Basin groundwater classifications (OAR 690-502-0160). As such, the finding of PSI may not ultimately lead to a denial of the application for the proposed use. While casing and sealing into deeper water-bearing zones within the CRB would preclude hydraulic connection with the Willamette River (and, thereby, preclude the assumption of PSI), the lack of hydraulic connection also means these deeper water-bearing zones are likely to receive less recharge; thus, the resource is likely less sustainable over the long term. By contrast, the shallow water-bearing zones within the CRB which are hydraulically connected to surface water are likely to receive far more recharge and, thus, are likely to be more sustainable over the long term. Thus, utilization of the shallow, hydraulically connected water-bearing zones may be advantageous over the long term, despite the finding of PSI.**

#### References Used:

Application File: G-19197

Water well reports: CLAC 9550, CLAC 9621, CLAC 9647, CLAC 9648, CLAC 9665, CLAC 9687, CLAC 12163, CLAC 65581

Pumping Test Reports: CLAC 285, WASH 1314, CLAC 8014, CLAC 9088, CLAC 12167, CLAC 20274, CLAC 56352

Conlon, T.D., Wozniak, K.C., Woodcock, D., Herrera, N.B., Fisher, B.J., Morgan, D.S., Lee, K.K., and Hinkle, S.R., 2005, Ground-water hydrology of the Willamette Basin, Oregon, Scientific Investigations Report 2005-5168: U. S. Geological Survey, Reston, VA.

Gannett, M.W. and Caldwell, R., 1998, Geologic framework of the Willamette Lowland aquifer system, Oregon and Washington, Professional Paper 1424-A, 32 p: U. S. Geological Survey, Reston, VA.

Leonard, A.R. and Collins, C. A. 1983. Ground Water in the Northern Part of Clackamas County, Oregon. Ground Water Report No. 29, Open-File Report 80-1049, 95 p: U.S. Department of the Interior Geological Survey.

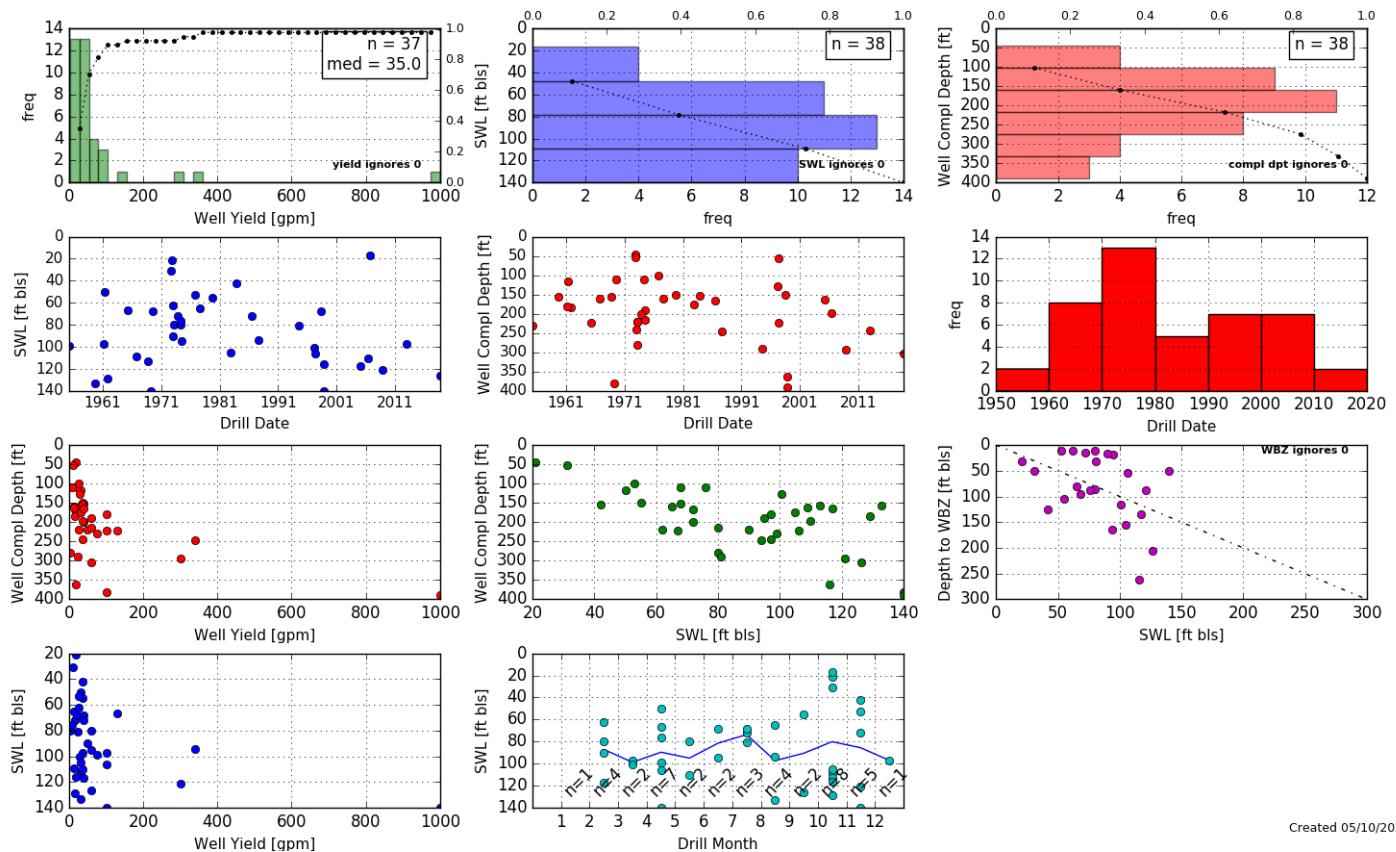
Oregon Lidar Consortium (OLC), 2016, OLC metro 2014 lidar project, Oregon Department of Geology & Mineral Industries, Portland, OR, November 30.

United States Geological Survey, 2014, National Hydrography Dataset (NHD), 1:24,000, U. S. Department of the Interior, Reston, VA.

United States Geological Survey, 1961, Canby quadrangle, Oregon [map], 1:24,000, 7.5 minute topographic series, U.S. Department of the Interior, Reston, VA.

**D. WELL CONSTRUCTION, OAR 690-200**

- D1. Well #: \_\_\_\_\_ Logid: \_\_\_\_\_
- D2. **THE WELL does not appear to meet current well construction standards based upon:**
- ☐ review of the well log;
  - ☐ field inspection by \_\_\_\_\_;
  - ☐ report of CWRE \_\_\_\_\_;
  - ☐ 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.

**Nearby Well Statistics**

Created 05/10/2022

## Water Availability Tables

## Water Availability Analysis

### Detailed Reports

WILLAMETTE R > COLUMBIA R - AT MOUTH  
WILLAMETTE BASIN

Water Availability as of 6/3/2022

Watershed ID #: 181 ([Map](#))

Date: 6/3/2022

Exceedance Level: 80% ▼

Time: 2:13 PM

Water Availability Calculation

Consumptive Uses and Storages

Instream Flow Requirements

Reservations

Water Rights

Watershed Characteristics

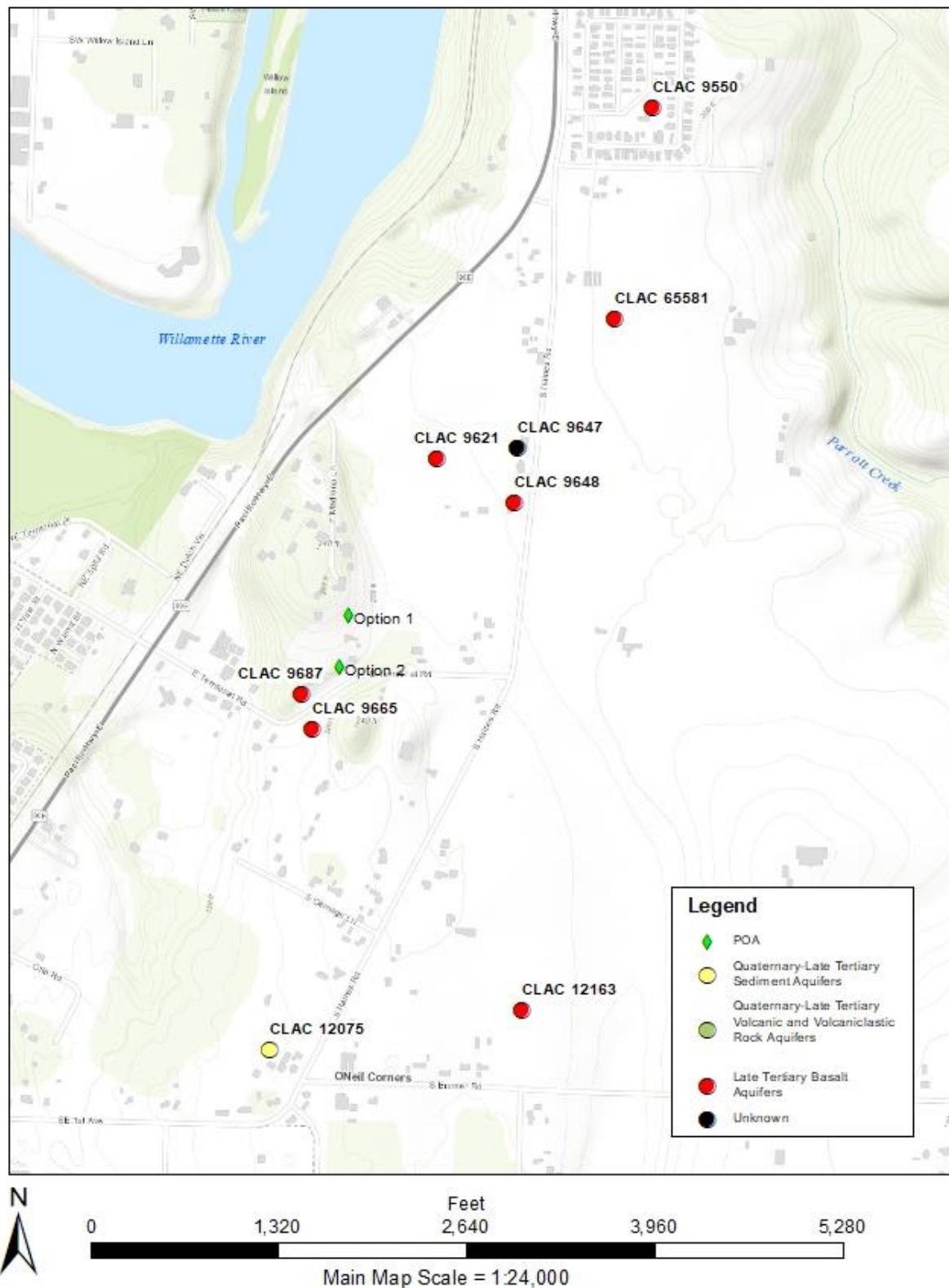
### Water Availability Calculation

Monthly Streamflow in Cubic Feet per Second  
Annual Volume at 50% Exceedance in Acre-Feet

| Month | Natural Stream Flow | Consumptive Uses and Storages | Expected Stream Flow | Reserved Stream Flow | Instream Flow Requirement | Net Water Available |
|-------|---------------------|-------------------------------|----------------------|----------------------|---------------------------|---------------------|
| JAN   | 27,500.00           | 2,700.00                      | 24,800.00            | 0.00                 | 1,500.00                  | 23,300.00           |
| FEB   | 30,000.00           | 7,970.00                      | 22,000.00            | 0.00                 | 1,500.00                  | 20,500.00           |
| MAR   | 28,500.00           | 7,540.00                      | 21,000.00            | 0.00                 | 1,500.00                  | 19,500.00           |
| APR   | 25,400.00           | 7,190.00                      | 18,200.00            | 0.00                 | 1,500.00                  | 16,700.00           |
| MAY   | 20,700.00           | 4,430.00                      | 16,300.00            | 0.00                 | 1,500.00                  | 14,800.00           |
| JUN   | 11,000.00           | 2,360.00                      | 8,640.00             | 0.00                 | 1,500.00                  | 7,140.00            |
| JUL   | 6,280.00            | 2,320.00                      | 3,960.00             | 0.00                 | 1,500.00                  | 2,460.00            |
| AUG   | 4,890.00            | 2,070.00                      | 2,820.00             | 0.00                 | 1,500.00                  | 1,320.00            |
| SEP   | 4,930.00            | 1,690.00                      | 3,240.00             | 0.00                 | 1,500.00                  | 1,740.00            |
| OCT   | 5,990.00            | 727.00                        | 5,260.00             | 0.00                 | 1,500.00                  | 3,760.00            |
| NOV   | 12,700.00           | 1,040.00                      | 11,700.00            | 0.00                 | 1,500.00                  | 10,200.00           |
| DEC   | 24,800.00           | 1,360.00                      | 23,400.00            | 0.00                 | 1,500.00                  | 21,900.00           |
| ANN   | 19,700,000.00       | 2,480,000.00                  | 17,300,000.00        | 0.00                 | 1,090,000.00              | 16,200,000.00       |

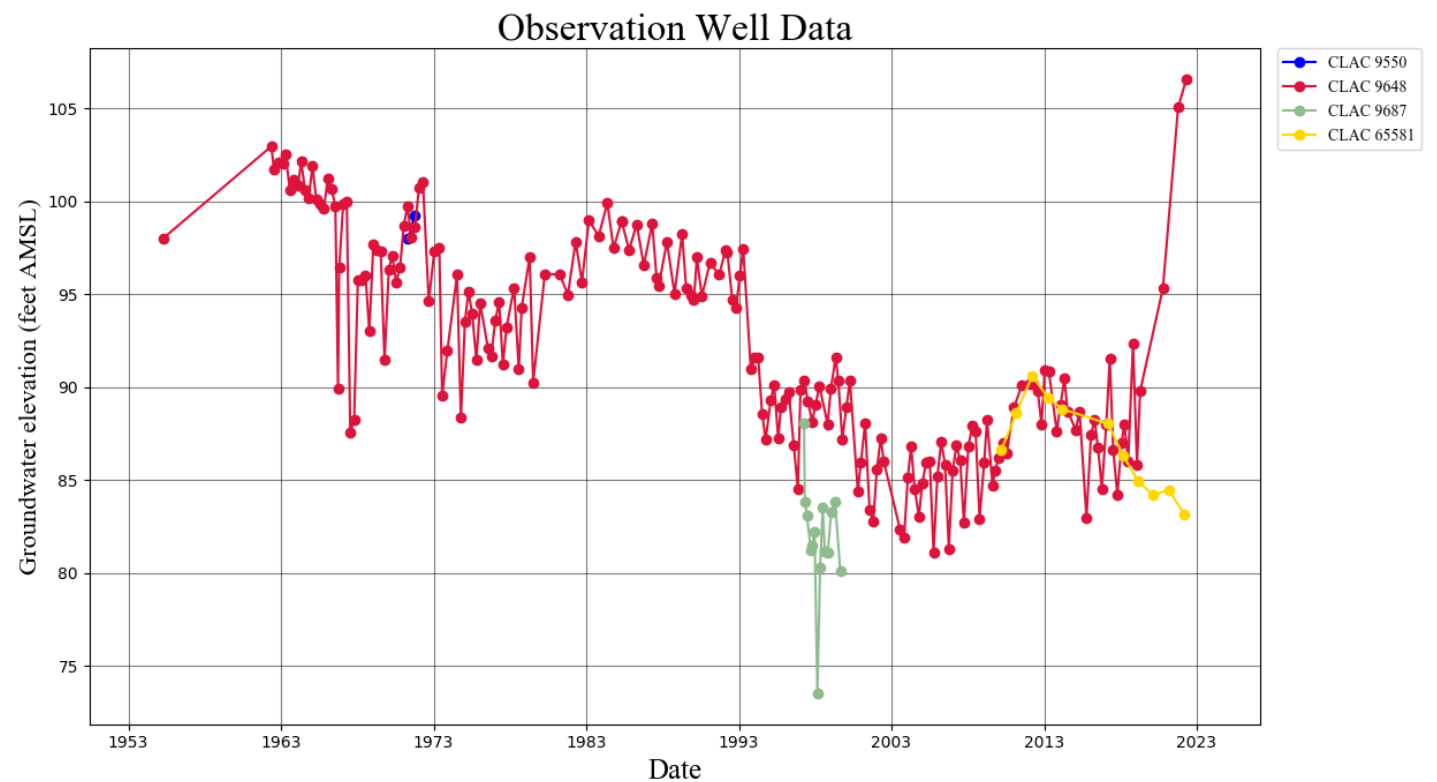
## Well Location Map

## G-19197

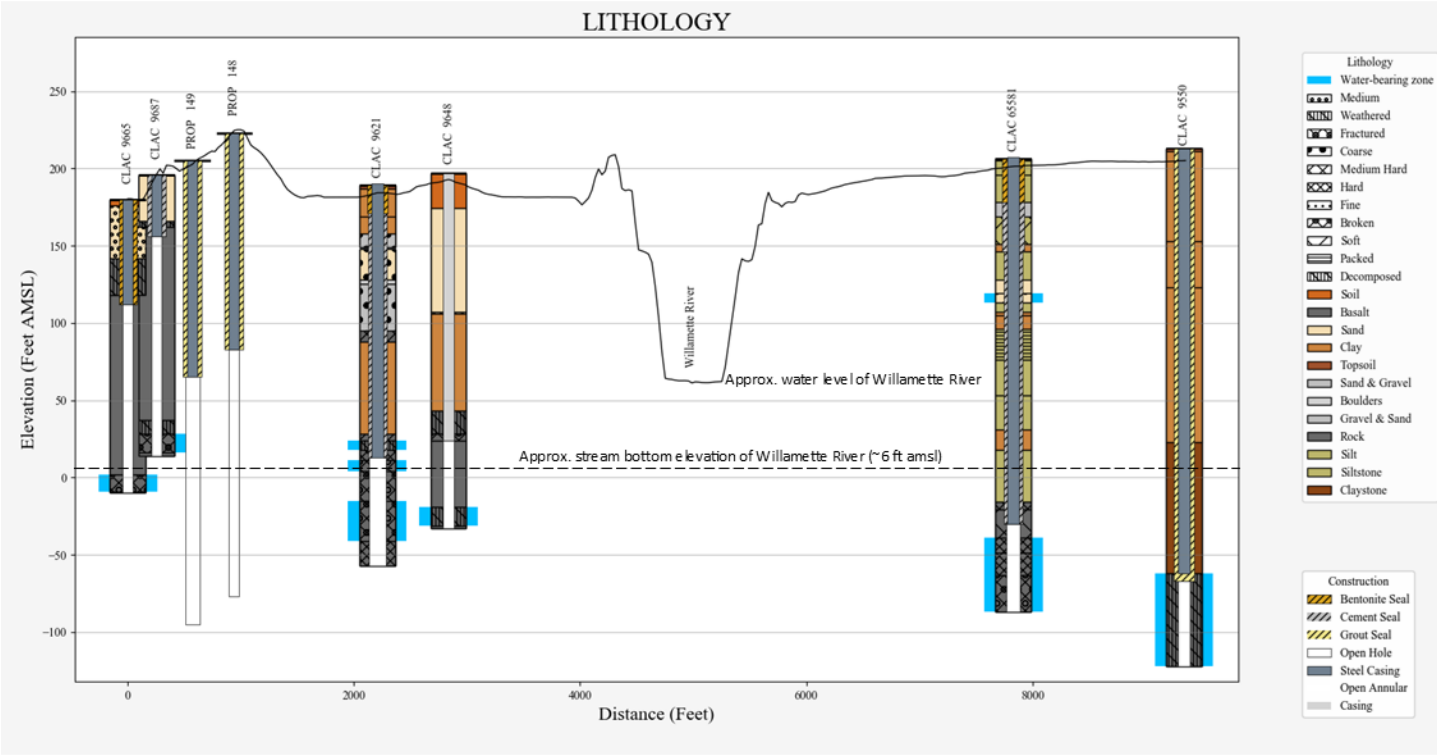


Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Water-Level Measurements in Nearby Wells



Cross section



## Stream depletion model

|                                      |       |
|--------------------------------------|-------|
| Application type:                    | G     |
| Application number:                  | 19197 |
| Well number:                         | 1     |
| Stream Number:                       | 1     |
| Pumping rate (cfs):                  | 0.13  |
| Pumping duration (days):             | 365.0 |
| Pumping start month number (3=March) | 3.0   |

| Parameter                                | Symbol | Scenario 1 | Scenario 2 | Scenario 3 | Units                |
|------------------------------------------|--------|------------|------------|------------|----------------------|
| Distance from well to stream             | a      | 1530.0     | 1530.0     | 1530.0     | ft                   |
| Aquifer transmissivity                   | T      | 50.0       | 660.0      | 6800.0     | ft <sup>2</sup> /day |
| Aquifer storativity                      | S      | 0.001      | 0.0005     | 0.0001     | -                    |
| Aquitard vertical hydraulic conductivity | Kva    | 0.001      | 0.05       | 0.01       | ft/day               |
| Not used                                 |        | 0.0        | 0.0        | 0.0        |                      |
| Aquitard thickness below stream          | babs   | 3.0        | 3.0        | 3.0        | ft                   |
| Not used                                 |        | 0.0        | 0.0        | 0.0        |                      |
| Stream width                             | ws     | 760.0      | 760.0      | 760.0      | ft                   |

Stream depletion for Scenario 2:

|                 |      |      |      |      |      |      |      |      |      |      |      |      |      |
|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Days            | 10   | 330  | 360  | 30   | 60   | 90   | 120  | 150  | 180  | 210  | 240  | 270  | 300  |
| Depletion (%)   | 75   | 95   | 96   | 85   | 89   | 91   | 93   | 93   | 94   | 94   | 95   | 95   | 95   |
| Depletion (cfs) | 0.10 | 0.12 | 0.12 | 0.11 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |

