

# Groundwater Application Review Summary Form

Application # G- 18855

GW Reviewer Travis Brown Date Review Completed: 9/3/2019

## 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).*



**PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS**

TO: Water Rights Section Date 9/3/2019  
 FROM: Groundwater Section Travis Brown  
Reviewer's Name  
 SUBJECT: Application G- 18855 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: Siri and Sons Farms County: Clackamas

A1. Applicant(s) seek(s) 0.5 cfs from 3 well(s) in the Willamette Basin,  
Molalla-Pudding River subbasin

A2. Proposed use Nursery Seasonality: Year-round

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 | Well 1             | Alluvium          | 0.5                | 3S/1E-19 SE-NW        | App: 1185' N, 1245' W fr C1/4 cor S 19 <sup>a</sup><br>OWRD: 1290' N, 1110' W fr C1/4 cor S 19 |
| 2    | Proposed | Well 2             | Alluvium          | 0.5                | 3S/1E-19 SE-NW        | App: 875' N, 665' W fr C1/4 cor S 19 <sup>a</sup><br>OWRD: 955' N, 555' W fr C1/4 cor S 19     |
| 3    | Proposed | Well 3             | Alluvium          | 0.5                | 3S/1E-19 SE-NW        | App: 900' N, 1230' W fr C1/4 cor S 19 <sup>a</sup><br>OWRD: 1000' N, 1100' W fr C1/4 cor S 19  |

\* 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    | ~107             |                    |            |          | 200             | 0-150              | 0-200                 |                      | TBD                          |                  |                |           |
| 2    | ~104             |                    |            |          | 200             | 0-150              | 0-200                 |                      | TBD                          |                  |                |           |
| 3    | ~104             |                    |            |          | 200             | 0-150              | 0-200                 |                      | TBD                          |                  |                |           |

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU are ~0.5 miles east of the City of Wilsonville, Oregon, on the south side of the Willamette River. The use would cover 19.9 acres of Nursery Use, with a total volume of up to 99.5 af/year.

<sup>a</sup> There appear to be discrepancies in the proposed POA locations provided in the application. The proposed POA locations described in the application by their distances from the center of Section 19 (metes and bounds) using the Department's Public Land Survey System (PLSS) projection are ~130-170 ft southwest of the locations indicated on the application map (using a copy of the map georeferenced to landmarks visible in aerial imagery). The Applicant's described metes-and-bounds locations for POA 1 and 3 are outside the projected boundary of Clackamas County Tax Lot 311. However, the Department projection of Clackamas County Tax Lot boundaries were last updated in January 2019, and the Clackamas County Tax Lot boundaries available in the County's online mapping application (<http://cmap.clackamas.us/maps/cmap>) appear to have been updated again since then. The OWRD metes-and-bounds locations of the proposed POA using the georeferenced application map and the Department PLSS projection are listed in the table under A3 above. The OWRD locations will be used for this review.

<sup>b</sup> Well construction is based on the details proposed in the application Section 3.

A5.  **Provisions of the** Molalla-Pudding River 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 will be completed in a confined aquifer based on the proposed construction; therefore, per OAR 690-09-0240, the relevant basin rules 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) 7n (annual measurement 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 alluvial 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: Groundwater for the proposed use cannot be determined to be over-appropriated due to insufficient available data regarding rates of recharge and the current quantity of groundwater withdrawals from the aquifer system.**

The proposed POA would be completed in the Willamette Confining Unit (Gannett and Caldwell, 1998). Thin layers of water-bearing sand have been noted within the proposed POA depths in nearby well logs (CLAC 70380 and CLAC 69002), but these do not appear to be laterally extensive as evidenced by several other nearby well logs which were immediately abandoned due to insufficient yields (CLAC 69797 and CLAC 73470).

The nearest known groundwater right to the proposed POA is CLAC 73475, authorized POA under Permit G-17787 (priority 9/9/2003), ~350 ft east of proposed POA 2. Due to the seemingly discontinuous nature of the water-bearing sands within the Willamette Confining Unit and a lack of high quality data with which to estimate hydraulic properties of the aquifer, it is difficult to anticipate how much the proposed use may interfere with nearby groundwater rights. Well completion statistics for other alluvial wells completed in Section 19 indicate a median well yield of ~30 gpm, with a maximum reported yield of 125 gpm (see Well Completion Statistics, attached). In order to achieve the total maximum rate requested (0.5 cfs), each of the proposed POA would need to yield ~75 gpm (~0.167 cfs), on average. While such a yield would represent ~250 percent of the median yield for wells in this area, it does not exceed the maximum reported yield (see Well Completion Statistics, attached). Water level data from the nearest observation wells (between ~0.7–2 miles south/southwest of the proposed POA) do not show widespread or persistent declines, although limited data is available through the present day (see Hydrograph, attached).

There is not sufficient evidence to conclude that the proposed use would likely result in injury to prior groundwater rights or would exceed the capacity of the groundwater resource. However, due to the potentially limited extent of water-bearing sands in the subject aquifer, the Conditions specified in B1(d) and B2(c) are strongly recommended for any permit issued pursuant to this application in order to protect senior users and the groundwater resource.

**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               |
|------|-----------------------------|-------------------------------------|--------------------------|
| 1-3  | Willamette Confining Unit   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

**Basis for aquifer confinement evaluation:** Reported water levels from nearby water wells are generally above their reported water-bearing zones (see Well Completion Statistics, attached). Furthermore, water table mapping in this area indicates water levels which are above the water-bearing zones noted in nearby well logs (Woodward et al., 1998). Based on the available evidence, the proposed aquifer is confined.

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   | ~85-90            | ~61-62            | ~640             | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>                | <input checked="" type="checkbox"/> |
| 1    | 2    | Molalla River      | ~85-90            | ~61-75            | ~3,850           | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>                | <input checked="" type="checkbox"/> |
| 2    | 1    | Willamette River   | ~85-90            | ~61-62            | ~1,060           | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>                | <input checked="" type="checkbox"/> |
| 2    | 2    | Molalla River      | ~85-90            | ~61-75            | ~3,200           | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>                | <input checked="" type="checkbox"/> |
| 3    | 1    | Willamette River   | ~85-90            | ~61-62            | ~930             | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>                | <input checked="" type="checkbox"/> |
| 3    | 2    | Molalla River      | ~85-90            | ~61-75            | ~3,700           | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>                | <input checked="" type="checkbox"/> |

**Basis for aquifer hydraulic connection evaluation:** The estimated static groundwater level is ~10-30 ft above nearby surface water elevations in the Willamette and Molalla Rivers. Water table mapping in this area indicates that alluvial groundwater is flowing toward and discharging into nearby surface water (Woodward et al., 1998). Based on the available evidence, the proposed aquifer is hydraulically connected to SW 1 (Willamette River) and SW 2 (Molalla River). Due to the closer proximity and deeper streambed (estimated at ~18 ft above mean sea level [amsl]) of SW 1, the proposed use is anticipated to more significantly affect SW 1 than SW 2. However, the hydraulic connection between the proposed aquifer and both SW 1 and SW 2 will likely be inefficient due to the significant intervening thickness of fine-grained sediments between the proposed water-bearing zone(s) and the streambeds of SW 1 and SW 2. Depletion of local surface water will be buffered, but not eliminated, by the low vertical hydraulic conductivity (permeability) of these fine-grained sediments. Net impacts will be small at the onset of pumping but will increase with time until a new equilibrium between local recharge and discharge is reached. At that time, depletion is expected to be relatively constant throughout the year.

**Water Availability Basin the well(s) are located within:** SW 1: WILLAMETTE R > COLUMBIA R - AT MOUTH  
SW 2: MOLALLA R > WILLAMETTE 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 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    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | MF181                   | 1,500                        | <input type="checkbox"/> | 4,890                  | <input type="checkbox"/>     | *                          | <input checked="" type="checkbox"/>     |
| 1    | 2    | <input type="checkbox"/>            | <input type="checkbox"/> | IS69796                 | 100                          | <input type="checkbox"/> | 134                    | <input type="checkbox"/>     | *                          | <input type="checkbox"/>                |
| 2    | 1    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | MF181                   | 1,500                        | <input type="checkbox"/> | 4,890                  | <input type="checkbox"/>     | *                          | <input checked="" type="checkbox"/>     |
| 2    | 2    | <input type="checkbox"/>            | <input type="checkbox"/> | IS69796                 | 100                          | <input type="checkbox"/> | 134                    | <input type="checkbox"/>     | *                          | <input type="checkbox"/>                |
| 3    | 1    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | MF181                   | 1,500                        | <input type="checkbox"/> | 4,890                  | <input type="checkbox"/>     | *                          | <input checked="" type="checkbox"/>     |
| 3    | 2    | <input type="checkbox"/>            | <input type="checkbox"/> | IS69796                 | 100                          | <input type="checkbox"/> | 134                    | <input type="checkbox"/>     | *                          | <input 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 # | 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? |
|--|------|--------------------------|-------------------------|------------------------------|--------------------------|------------------------|------------------------------|----------------------------|---|
|  |      | <input type="checkbox"/> |                         |                              | <input type="checkbox"/> |                        | <input type="checkbox"/>     |                            | <input type="checkbox"/>                |

**Comments:** The proposed POA are less than 1/4 mile from the nearest hydraulically connected surface water source (SW 1, the Willamette River). Per OAR 690-09-0040(4)(a), the Potential for Substantial Interference (PSI) with SW 1 is assumed.

\* Interference with (depletion of) nearby surface water due to the proposed use was not modeled analytically due to the potentially discontinuous nature of water-bearing sands within the Willamette Confining Unit and significant uncertainty regarding the appropriate hydraulic parameters. However, based on professional judgement and the substantial intervening thickness of fine-grained sediments between the proposed production depth(s) and the elevation of nearby streambeds, interference with nearby surface water due to the proposed use is anticipated to be less than 25 percent of the rate of withdrawal within 30 days of continuous pumping.

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.

| <b>Non-Distributed Wells</b> |     |     |     |     |     |     |     |     |     |     |     |     |     |
|------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Well                         | SW# | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|                              |     | %   | %   | %   | %   | %   | %   | %   | %   | %   | %   | %   | %   |
| Well Q as CFS                |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Interference CFS             |     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Distributed Wells</b>     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Well                         | SW# | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|                              |     | %   | %   | %   | %   | %   | %   | %   | %   | %   | %   | %   | %   |
| 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:** N/A

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:** The proposed POA should be continuously cased and sealed to at least 150 ft bls in order to minimize acute interference with nearby surface water sources.

**References Used:**

Application File: G-18855

Permit File: G-17787

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.

United States Geological Survey, 2013, National Elevation Dataset (NED) [DEM geospatial data]. 1/9th arc-second, updated 2013.

United States Geological Survey, 2017, Canby quadrangle, Oregon [map], 1:24,000, 7.5 minute topographic series, U.S. Department of the Interior, Reston, VA.

Watershed Sciences, 2009, LIDAR remote sensing data collection, Department of Geology and Mineral Industries, Willamette Valley Phase I, Oregon: Portland, OR, May 27.

Woodward, D.G., Gannett, M.W., and Vaccaro, J.J., 1998, Hydrogeologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-B, 82 p.

WSI, 2015, OLC Metro 2014, Portland, OR, May 8.

**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:** \_\_\_\_\_

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

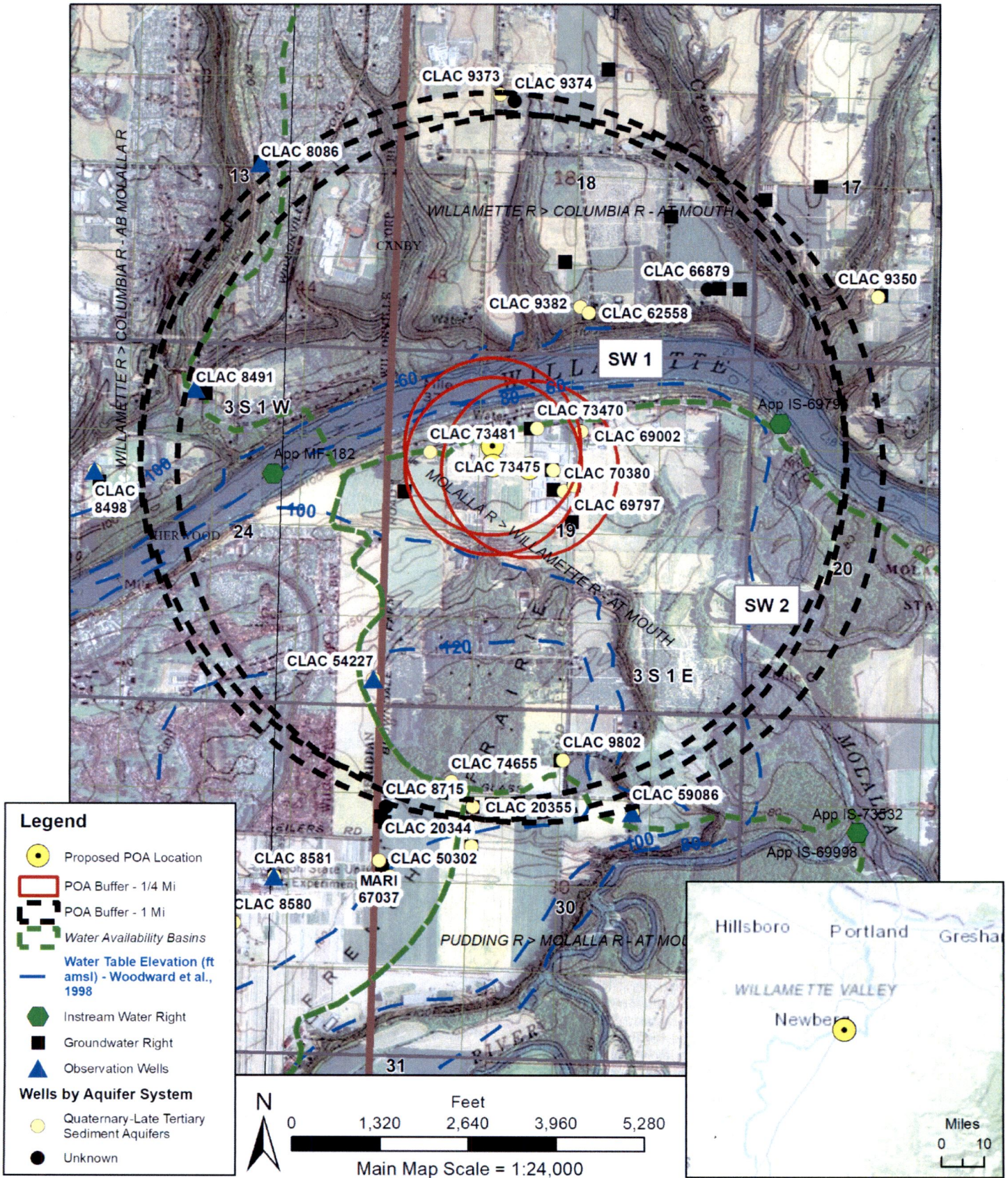
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Well Location Map

# G-18855 Siri and Sons Farms

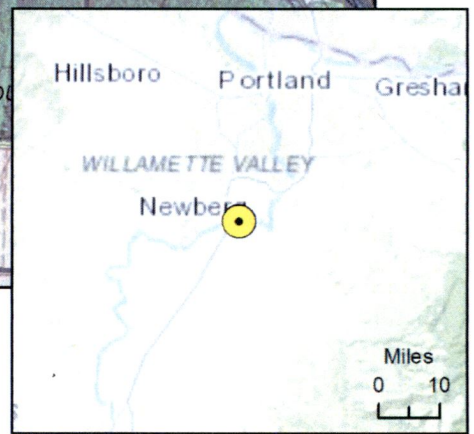
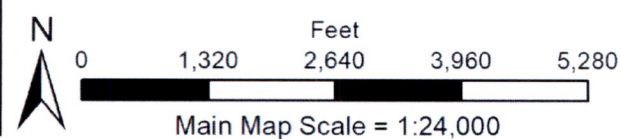


**Legend**

- Proposed POA Location
- POA Buffer - 1/4 Mi
- POA Buffer - 1 Mi
- Water Availability Basins
- Water Table Elevation (ft amsl) - Woodward et al., 1998
- Instream Water Right
- Groundwater Right
- ▲ Observation Wells

**Wells by Aquifer System**

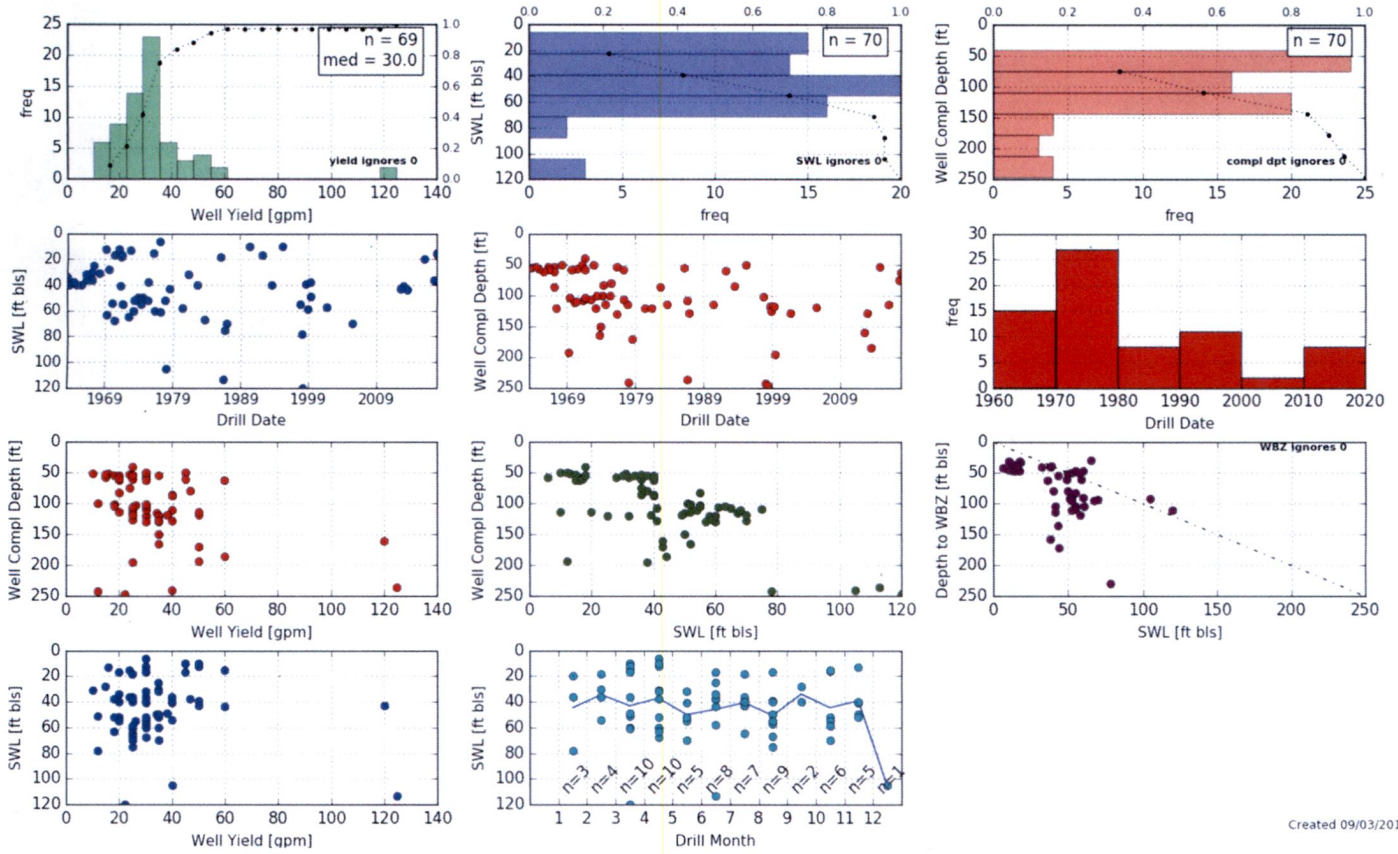
- Quaternary-Late Tertiary Sediment Aquifers
- Unknown



Service Layer Credits: Oregon Statewide Imagery Program (OSIP) - Oregon Imagery Framework Implementation Team  
 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), swisstopo, © OpenStreetMap contributors, and the GIS User Community  
 Copyright © 2013 National Geographic Society, i-cubed

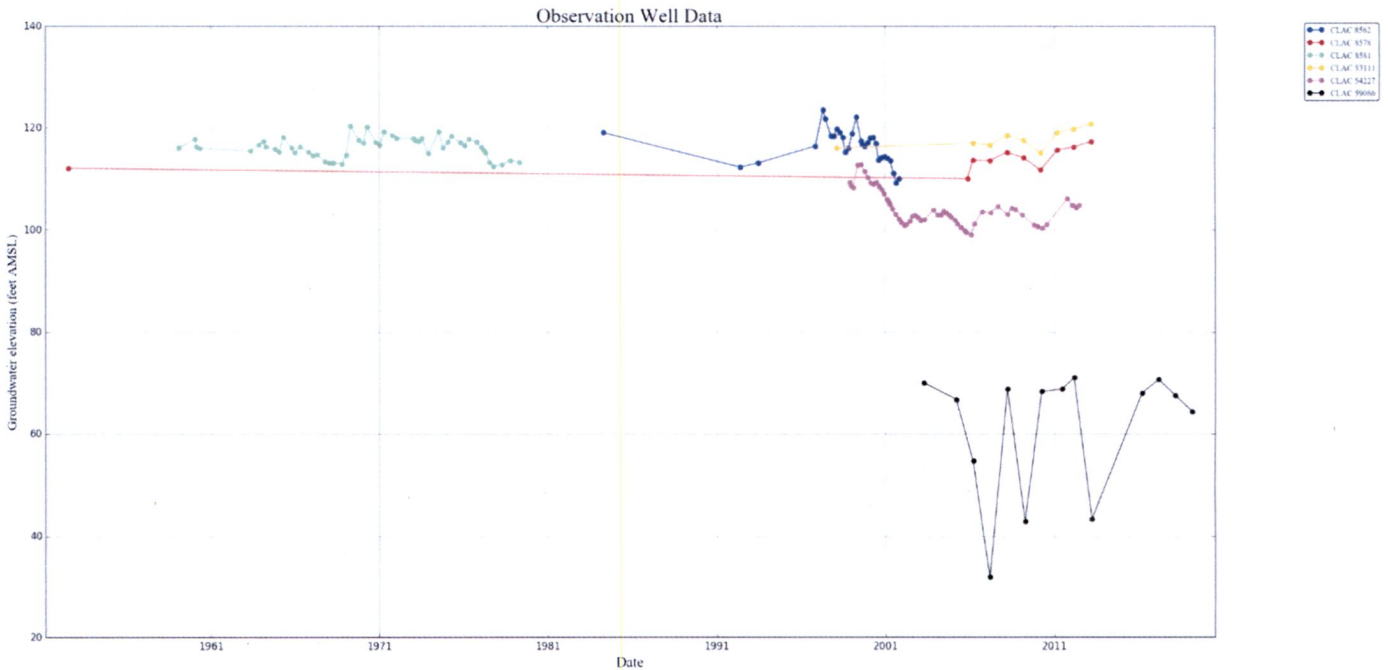


### Well Completion Statistics



Created 09/03/2019

### Hydrographs



Water Availability Tables

## Water Availability Analysis Detailed Reports

WILLAMETTE R > COLUMBIA R - AT MOUTH  
WILLAMETTE BASIN

Water Availability as of 9/3/2019

Watershed ID #: 181 ([Map](#))  
Date: 9/3/2019

Exceedance Level: 80%  
Time: 5:31 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           | 2,820.00                      | 24,700.00            | 0.00                 | 1,500.00                  | 23,200.00           |
| FEB   | 30,000.00           | 8,090.00                      | 21,900.00            | 0.00                 | 1,500.00                  | 20,400.00           |
| MAR   | 28,500.00           | 7,650.00                      | 20,900.00            | 0.00                 | 1,500.00                  | 19,400.00           |
| APR   | 25,400.00           | 7,250.00                      | 18,100.00            | 0.00                 | 1,500.00                  | 16,600.00           |
| MAY   | 20,700.00           | 4,470.00                      | 16,200.00            | 0.00                 | 1,500.00                  | 14,700.00           |
| JUN   | 11,000.00           | 2,360.00                      | 8,640.00             | 0.00                 | 1,500.00                  | 7,140.00            |
| JUL   | 6,280.00            | 2,310.00                      | 3,970.00             | 0.00                 | 1,500.00                  | 2,470.00            |
| AUG   | 4,890.00            | 2,070.00                      | 2,820.00             | 0.00                 | 1,500.00                  | 1,320.00            |
| SEP   | 4,930.00            | 1,700.00                      | 3,230.00             | 0.00                 | 1,500.00                  | 1,730.00            |
| OCT   | 5,990.00            | 740.00                        | 5,250.00             | 0.00                 | 1,500.00                  | 3,750.00            |
| NOV   | 12,700.00           | 1,090.00                      | 11,600.00            | 0.00                 | 1,500.00                  | 10,100.00           |
| DEC   | 24,800.00           | 1,470.00                      | 23,300.00            | 0.00                 | 1,500.00                  | 21,800.00           |
| ANN   | 19,700,000.00       | 2,520,000.00                  | 17,200,000.00        | 0.00                 | 1,090,000.00              | 16,100,000.00       |

## Water Availability Analysis Detailed Reports

MOLALLA R > WILLAMETTE R - AT MOUTH  
WILLAMETTE BASIN

Water Availability as of 9/3/2019

Watershed ID #: 69796 ([Map](#))  
Date: 9/3/2019

Exceedance Level: 80%  
Time: 5:31 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   | 1,870.00            | 155.00                        | 1,720.00             | 0.00                 | 500.00                    | 1,220.00            |
| FEB   | 2,010.00            | 144.00                        | 1,870.00             | 0.00                 | 500.00                    | 1,370.00            |
| MAR   | 1,830.00            | 113.00                        | 1,720.00             | 0.00                 | 500.00                    | 1,220.00            |
| APR   | 1,530.00            | 86.30                         | 1,440.00             | 0.00                 | 500.00                    | 944.00              |
| MAY   | 927.00              | 97.40                         | 830.00               | 0.00                 | 500.00                    | 330.00              |
| JUN   | 431.00              | 119.00                        | 312.00               | 0.00                 | 500.00                    | -188.00             |
| JUL   | 204.00              | 184.00                        | 20.00                | 0.00                 | 200.00                    | -180.00             |
| AUG   | 139.00              | 155.00                        | -15.50               | 0.00                 | 100.00                    | -116.00             |
| SEP   | 134.00              | 82.40                         | 51.60                | 0.00                 | 150.00                    | -98.40              |
| OCT   | 188.00              | 39.30                         | 149.00               | 0.00                 | 450.00                    | -301.00             |
| NOV   | 637.00              | 79.80                         | 557.00               | 0.00                 | 500.00                    | 57.20               |
| DEC   | 1,700.00            | 150.00                        | 1,550.00             | 0.00                 | 500.00                    | 1,050.00            |
| ANN   | 1,320,000.00        | 84,800.00                     | 1,240,000.00         | 0.00                 | 295,000.00                | 967,000.00          |