Groundwater Application Review Summary Form

Application # G- 19472

GW Reviewer Travis Brown Date Review Completed: 3/13/2025

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 **_3/13/2025_**

TO: **Application** G-**_19472_**

FROM: **GW:** **_Travis Brown_**
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

☐ **YES**
☒ **NO** The source of appropriation is hydraulically connected to a State Scenic Waterway or its tributaries

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

☐ 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 3/13/2025
FROM: Groundwater Section Travis Brown
Reviewer's Name
SUBJECT: Application G- **19472** 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: **Ellen A. Kayner Revocable Living Trust** County: **LINN**

A1. Applicant(s) seek(s) 0.99 cfs from 1 well(s) in the Willamette Basin, Santiam-Calapooia subbasin

A2. Proposed use Irrigation (185 ac | 462.5 af/yr) Seasonality: May 1 – Sep 30 (152 days)

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

POA Well	Logid	Applicant's Well ID	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	LINN 11978	Well A	Alluvium	0.99	13S/3W-34 SW-NW	2400' S, 510' E fr NW cor S 34

* Alluvium, CRB, Bedrock

POA Well	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Drawdown (ft)	Test Type
1	105	0-18	+1-85; 98-100	N/A	85-98 (Perf)	350	87	Pump (3.5 hr)

POA Well	Land Surface Elevation at Well (ft amsl)	Depth of First Water (ft bls)	SWL (ft bls)	SWL Date	Reference Level (ft bls)	Reference Level Date
1	291	37	8	10/28/1980	TBD	TBD

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU is ~2.5 miles west of Brownsville, OR.

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 produces groundwater from a confined aquifer and is more than ¼ mile from the nearest surface water source. Per OAR 690-502-0240, the relevant basin rules (OAR 690-502-0110) are not activated.

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) **7RLN, 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:** The proposed POA produces groundwater from the Willamette alluvial aquifer system, which in this area is semi-confined by varying thicknesses of overlying Willamette silt (Gannett and Caldwell, 1998; McClaughry et al., 2010; Well Reports). The Willamette silt has been eroded to varying degrees by low-gradient streams in the Calapooia River drainage; more recent Holocene alluvial silt to gravel has been deposited as well. Numerous, low-gradient perennial streams flow through area along with intermittent streams and wetlands. Due to the thin, variable confining unit, which appears absent near many of the stream channels (McClaughry et al., 2010), and the shallow water table (Woodward et al., 1998), the alluvial aquifer likely has an efficient hydraulic connection to nearby surface water.

Water level data in the area is limited. The nearest well with current water level data is LINN 64050, ~2 miles southeast of the POA. However, regionally, water levels in the alluvial aquifer system appear stable (see attached Hydrograph), which conforms with the conceptual model of the alluvial aquifer system having an efficient hydraulic connection with nearby surface water. Well pumping is, therefore, likely quickly and predominantly derived from surface water capture rather than groundwater storage. **Based on the preponderance of the available evidence, the groundwater resource is not over-appropriated.**

The nearest known neighboring well is LINN 62990, ~1,900 ft southeast of the proposed POA. Given the intervening distance, the semi-confined nature of the aquifer, and the apparently efficient hydraulic connection with nearby surface water sources, the proposed use is not anticipated to cause interference with LINN 62990 or similarly located wells in excess of permit condition limits or thresholds for injury.

The proposed rate is 0.99 cfs (~444 gpm). The well report for the POA (LINN 11978) reported a yield of 350 gpm (0.780 cfs) based on 3.5 hr pumping test which resulted in 87 ft of drawdown, which would equate to a specific capacity of ~4 gpm/ft. As the entire water column in LINN 11978 at the time of the test was reported was 97 ft (static water level of 8 ft bls – total depth of 105 ft bls), based on the specific capacity, pumping the well dry would only yield up to 390 gpm (~0.869 cfs). It should also be noted that the well cannot be dewatered by pumping due to the need to maintain some amount of water above the pump intake (to prevent cavitation and damage to the pump) and the need for the pump to be set some distance above the

bottom of the well to avoid drawing damaging amounts of sediment into the pump. Therefore, based on the available evidence, the reported yield of 350 gpm (0.780 cfs) on the well report probably is the maximum feasible yield for the well, and even that may not be sustainable over the long term as the duration of the pumping test was only 3.5 hrs. **As such, it would appear that the sole POA, LINN 11978, is unable to produce the requested rate of 0.99 cfs; the requested rate is, therefore, beyond the capacity of the groundwater resource based on the well system as specified in the application.** The nearest well with an approved pumping test is LINN 62990, which reported a specific capacity of only 1.4 gpm/ft, ~36% of the specific capacity reported for LINN 11978. Furthermore, LINN 11978 reported the highest yield of any well in T13S/R3W Sections 33 and 34 by a margin of 150 gpm. Therefore, it appears unlikely that a replacement well would be capable of yielding a higher rate than LINN 11978. To achieve the requested rate, the applicant would need additional POA wells. Alternatively, the applicant could amend their application to reduce their requested rate to the reported yield of 350 gpm (0.780 cfs) for LINN 11978 and, thereby, be within the capacity of the groundwater resource.

For any permit issued pursuant to this application, the conditions specified in B1(d)(i) and B2(c), above, are recommended 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	**Alluvial**	☒	☐

Basis for aquifer confinement evaluation: Reported water levels in the subject well (LINN 11978) are above the first reported water-bearing zone and overlying fine-grained sediments likely act as a confining unit. Nearby wells similarly report water levels above well open/perforated intervals and overlying fine-grained sediments. Available data indicates the alluvial aquifer system in this area is predominantly (albeit weakly) 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 ft msl	SW Elev ft msl	Distance (ft)	Hydraulically Connected? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	**1**	**Unnamed tributary to Courtney Creek**	**~280[a]**	**~275[b]**	**~2,920**	☒	☐	☐	☐	☒
1	**2**	**Courtney Creek**	**~280[a]**	**~271-286[b]**	**~3,100**	☒	☐	☐	☐	☒
1	**3**	**Calapooia River**	**~280[a]**	**~275-287[b]**	**~3,700**	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: Groundwater elevations are coincident with nearby surface water elevations. Geologic mapping indicates the Willamette silt and other fine-grained units have largely been eroded away near the channels of nearby streams (McClaughry et al., 1998). Available evidence indicates a relatively efficient hydraulic connection with nearby surface water sources.

[a] Well report for LINN 11981; LIDAR surface elevation; Woodward et al., 1998.

[b] LIDAR surface elevation within 1 mile of proposed POA.

Water Availability Basin the well(s) are located within: CALAPOOIA R > WILLAMETTE R – AB 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**	☐	☐	**N/A**	**N/A**	☐	**22.70**	☒	**<25**	☒
1	**2**	☐	☐	**N/A**	**N/A**	☐	**22.70**	☒	**<25**	☒
1	**3**	☐	☐	**Cert 81630**	**12.0**	☒	**22.70**	☒	**<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 proposed rate of 0.99 cfs is greater than 1 percent (0.227 cfs) of the natural streamflow (22.7 cfs) which is exceeded 80 percent of time for SW 1, 2, and 3 (see attached Water Availability Analysis). Per former OAR 690-009-0040(4)(c) (effective for applications received prior to 9/17/2024), the potential for substantial interference (PSI) with SW 1, 2, and 3 is assumed.**

The proposed rate of 0.99 cfs is greater than 1 percent (0.12 cfs) of the pertinent instream water right (Certificate 81630, 12.0 cfs) for SW 3 (Calapooia River). Per former OAR 690-009-0040(4)(c) (effective for applications received prior to 9/17/2024), the potential for substantial interference (PSI) with SW 3 is assumed.

The Hunt 2003 analytical stream depletion model was used to estimate 30-day interference with SW 1, 2, and 3 (see attached Stream Depletion Analysis). Hydraulic parameters used for the analysis were derived from regional data and studies (Pumping Test Reports; Conlon et al., 2003, 2005; Iverson, 2002; 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; Halford and Kuniansky, 2002). Results of the analysis indicate that interference with surface water sources due to the proposed use is unlikely to exceed 25 percent of the rate of pumping 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.

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													
(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:** _____

References Used:

Well Reports: LINN 11978, 11979, 11980, 11981, 11982, 11983, 14398, 59390, 59391

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.

Domenico, P.A. and Mifflin, 1965, Water from low-permeability sediments and land subsidence: Water Resource Research, v. 1, no. 4, p. 563-576.

Freeze, R.A. and Cherry, J.A., 1979, Groundwater, Prentice Hall, Englewood Cliffs, New Jersey, 604 p.

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.

Halford, K.J., and Kuniansky, E.L., 2002, Documentation of Spreadsheets for the Analysis of Aquifer-Test and Slug-Test Data, Open File Report 02-197, 51 p: U. S. Geological Survey, Reston, VA.

Iverson, J., 2002, Investigation of the hydraulic, physical, and chemical buffering capacity of Missoula flood deposits for water quality and supply in the Willamette Valley of Oregon: Unpublished M.S. thesis, Oregon State University, 147 p.

McClaughry, J.D., Wiley, T.J., Ferns, M.L., and Madin, I.P., 2010, Digital geologic map of the southern Willamette Valley, Benton, Lane, Linn, Marion, and Polk Counties, Oregon, Open-File Report O-2010-03, 116 p., 1 pl: Oregon Department of Geology and Mineral Industries, Portland, OR.

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.

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 _____;

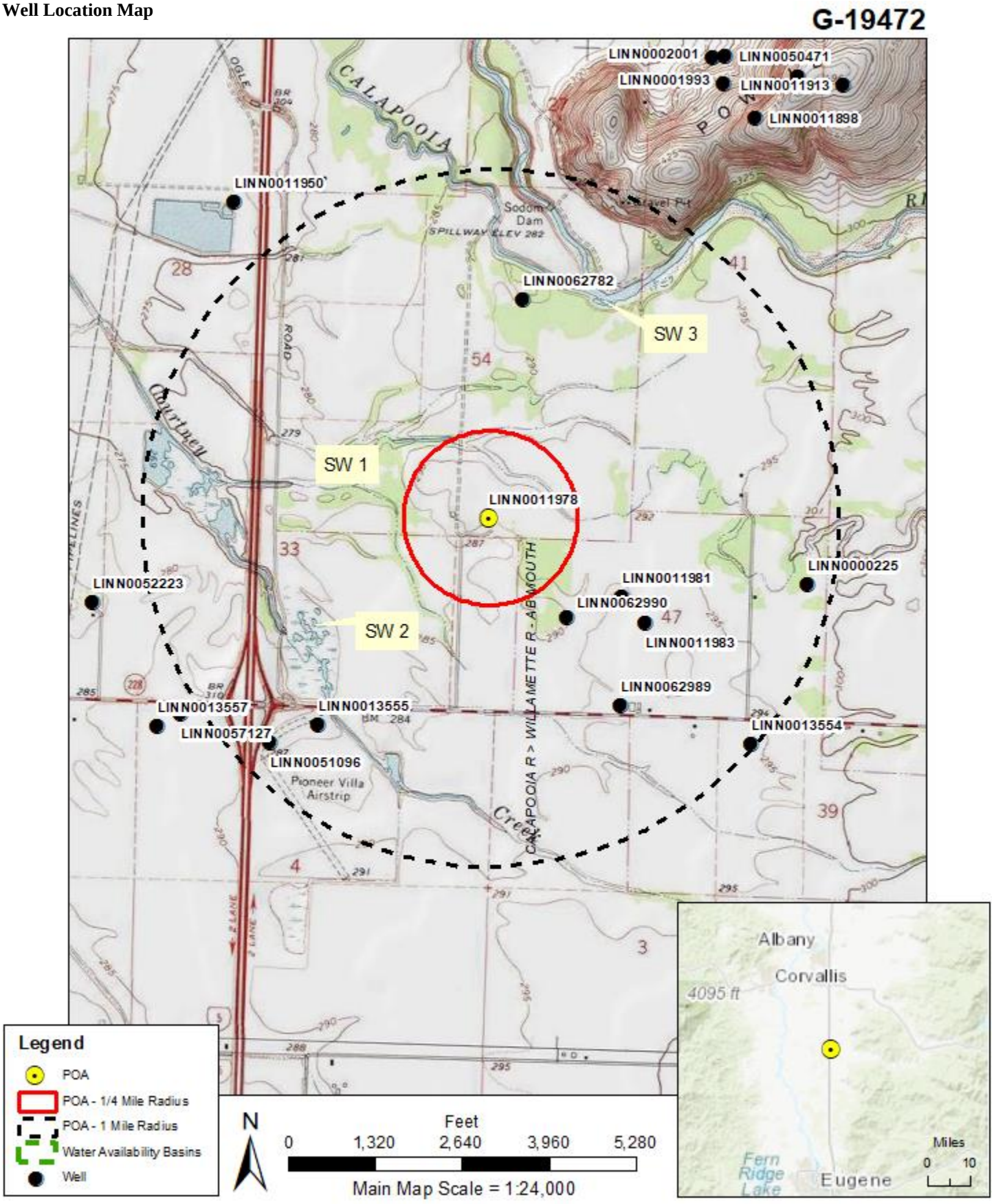
c. ☐ report of CWRE _____;

d. ☐ other: (specify) _____

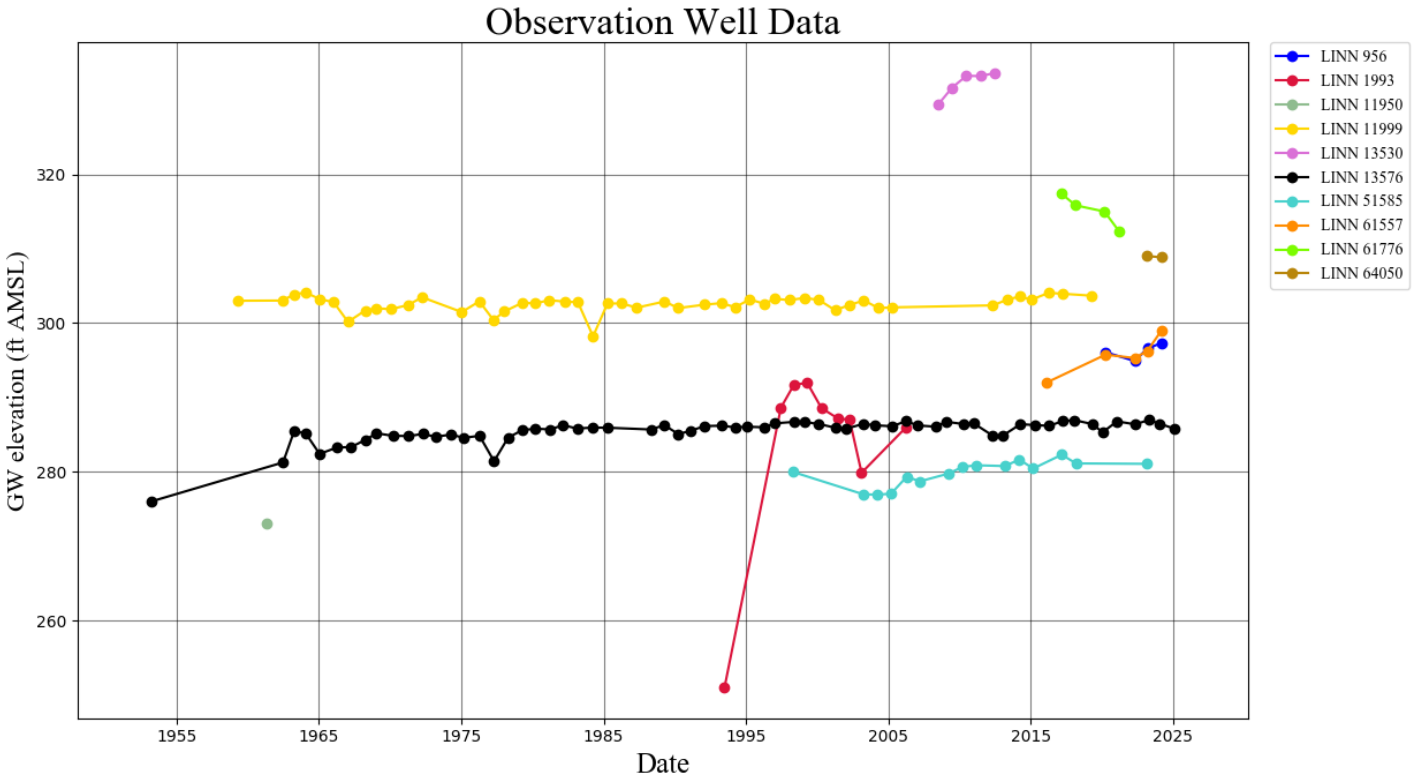
D3. **THE WELL construction deficiency or other comment is described as follows:** _____

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

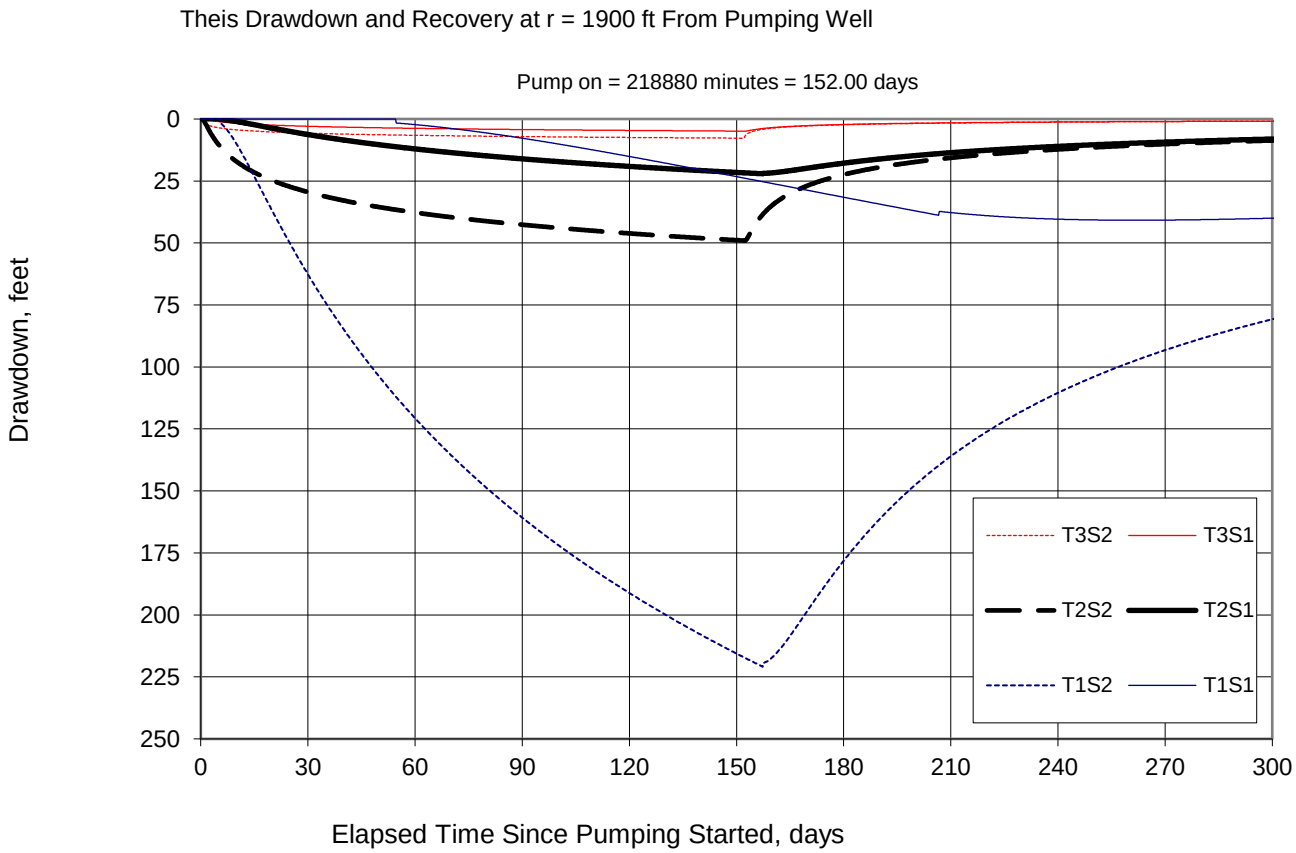
Well Location Map



Hydrograph


Observation Well Data
GW elevation (ft AMSL)
320
300
280
260
1955
1965
1975
1985
1995
2005
2015
2025
Date
LINN 956
LINN 1993
LINN 11950
LINN 11999
LINN 13530
LINN 13576
LINN 51585
LINN 61557
LINN 61776
LINN 64050

Theis Interference Analysis – LINN 62990



Total pumping time = 152 days [requested season of use]

Radial distance, r = 1,900 ft [approx. distance from POA to LINN 62990]

Pumping rate: 0.99 cfs [maximum requested rate]

Transmissivity: T1=55 ft^2/d; T2=550 ft^2/d; T3=5500 ft^2/d [pumping test reports]

Storativity: S1=0.01; S2=0.001 [Conlon et al., 2005]

Water Availability Analysis

Water Availability Analysis
Detailed Reports

CALAPOOIA R > WILLAMETTE R - AB MOUTH
WILLAMETTE BASIN

Water Availability as of 3/11/2025

Watershed ID #: 76 (Map) Exceedance Level: 80%
Date: 3/11/2025 Time: 4:21 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	592.00	4.75	587.00	0.00	140.00	447.00
FEB	650.00	4.68	645.00	0.00	140.00	505.00
MAR	575.00	3.50	571.00	0.00	140.00	431.00
APR	423.00	3.18	420.00	0.00	140.00	280.00
MAY	234.00	19.60	214.00	0.00	140.00	74.40
JUN	111.00	15.30	95.70	0.00	90.00	5.67
JUL	49.00	23.80	25.20	0.00	50.00	-24.80
AUG	26.00	17.20	8.77	0.00	30.00	-21.20
SEP	22.70	8.89	13.80	0.00	39.30	-25.50
OCT	29.60	2.02	27.60	0.00	59.90	-32.30
NOV	133.00	2.53	130.00	0.00	140.00	-9.53
DEC	499.00	4.70	494.00	0.00	140.00	354.00
ANN	404,000.00	6,690.00	397,000.00	0.00	75,200.00	324,000.00

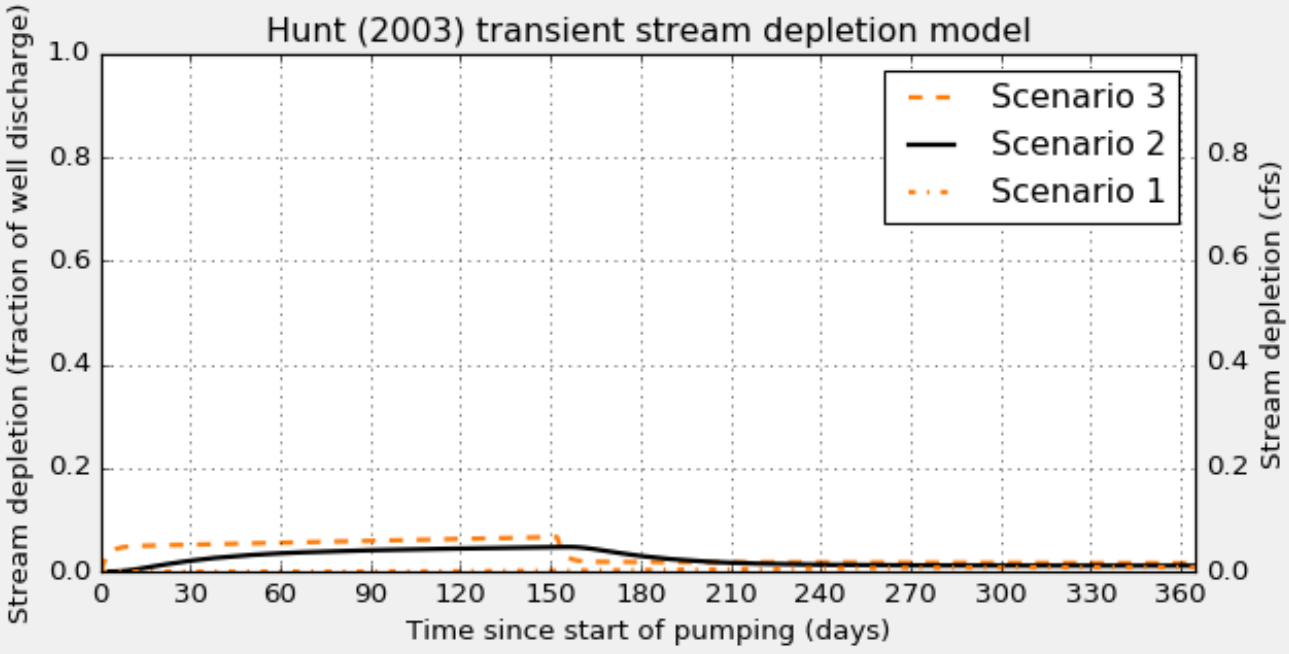
Stream Depletion Analysis – SW 1

Application type:	G
Application number:	19472
Well number:	1
Stream Number:	1
Pumping rate (cfs):	0.99
Pumping duration (days):	152
Pumping start month number (3=March)	3.0
Plotting duration (days)	365

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	2920	2920	2920	ft
Aquifer transmissivity	T	55	550	5500	ft2/day
Aquifer storativity	S	0.01	0.005	0.001	-
Aquitard vertical hydraulic conductivity	Kva	0.001	0.005	0.01	ft/day
Aquitard saturated thickness	ba	30	30	30	ft
Aquitard thickness below stream	babs	1	1	1	ft
Aquitard specific yield	Sya	0.1	0.1	0.1	-
Stream width	ws	30	30	30	ft

Stream depletion for Scenario 2:

Days	10	330	360	30	60	90	120	150	180	210	240	270	300
Depletion (%)	0	1	1	2	4	4	4	5	3	2	1	1	1
Depletion (cfs)	0.00	0.01	0.01	0.02	0.03	0.04	0.04	0.05	0.03	0.02	0.01	0.01	0.01



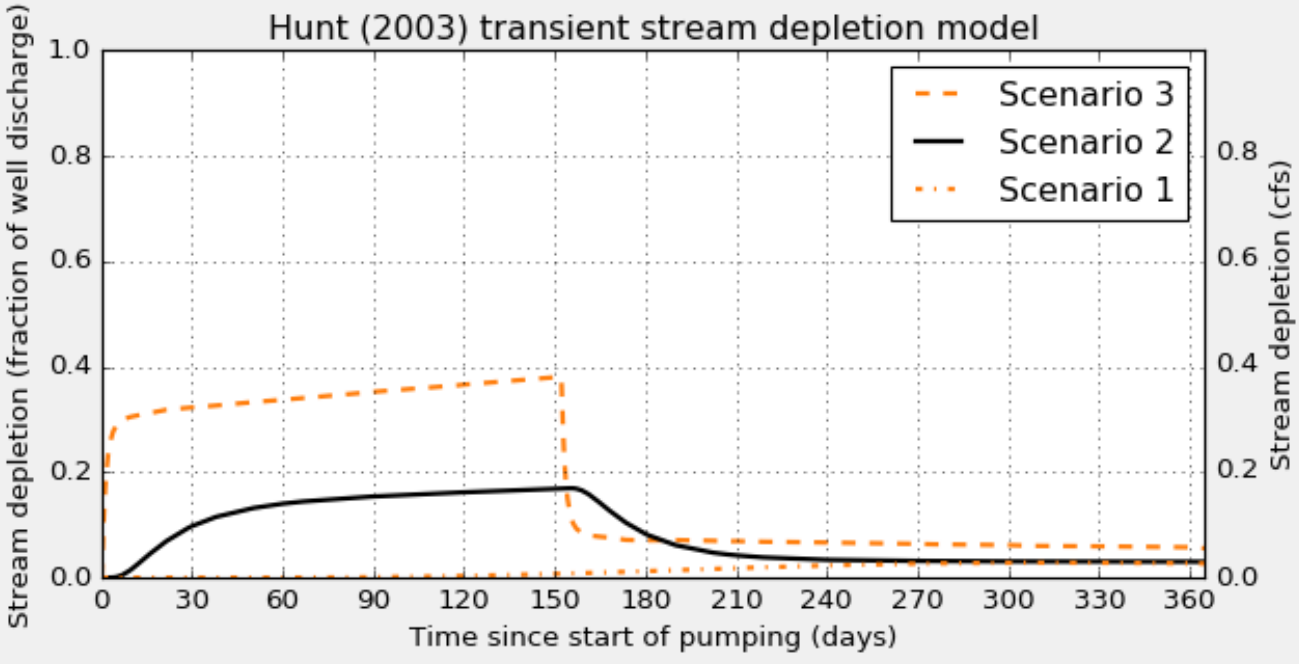
Stream Depletion Analysis – SW 2

Application type:	G
Application number:	19472
Well number:	1
Stream Number:	2
Pumping rate (cfs):	0.99
Pumping duration (days):	152
Pumping start month number (3=March)	3.0
Plotting duration (days)	365

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	3100	3100	3100	ft
Aquifer transmissivity	T	55	550	5500	ft2/day
Aquifer storativity	S	0.01	0.005	0.001	-
Aquitard vertical hydraulic conductivity	Kva	0.001	0.005	0.01	ft/day
Aquitard saturated thickness	ba	30	30	30	ft
Aquitard thickness below stream	babs	1	1	1	ft
Aquitard specific yield	Sya	0.1	0.1	0.1	-
Stream width	ws	500	500	500	ft

Stream depletion for Scenario 2:

Days	10	330	360	30	60	90	120	150	180	210	240	270	300
Depletion (%)	2	3	3	10	14	15	16	17	8	4	3	3	3
Depletion (cfs)	0.02	0.03	0.03	0.10	0.14	0.15	0.16	0.17	0.08	0.04	0.03	0.03	0.03



Stream Depletion Analysis – SW 3

Application type:	G
Application number:	19472
Well number:	1
Stream Number:	3
Pumping rate (cfs):	0.99
Pumping duration (days):	152
Pumping start month number (3=March)	3.0
Plotting duration (days)	365

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	3700	3700	3700	ft
Aquifer transmissivity	T	55	550	5500	ft2/day
Aquifer storativity	S	0.01	0.005	0.001	-
Aquitard vertical hydraulic conductivity	Kva	0.001	0.005	0.01	ft/day
Aquitard saturated thickness	ba	30	30	30	ft
Aquitard thickness below stream	babs	1	1	1	ft
Aquitard specific yield	Sya	0.1	0.1	0.1	-
Stream width	ws	120	120	120	ft

Stream depletion for Scenario 2:

Days	10	330	360	30	60	90	120	150	180	210	240	270	300
Depletion (%)	0	2	2	3	6	7	7	8	5	3	2	2	2
Depletion (cfs)	0.00	0.02	0.02	0.03	0.06	0.07	0.07	0.08	0.05	0.03	0.02	0.02	0.02