

Groundwater Application Review Summary Form

Application # G- 18423

GW Reviewer DENNIS ORLOWSKI Date Review Completed: 7/6/2017

Summary of GW Availability and Injury Review:

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

Summary of Potential for Substantial Interference Review:

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 07/06/2017
 FROM: Groundwater Section Dennis Orlowski
Reviewer's Name
 SUBJECT: Application G- 18423 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: Banfield Pet Hospital County: Multnomah

A1. Applicant(s) seek(s) 0.12 cfs from one well(s) in the Willamette Basin,
Columbia Slough subbasin

A2. Proposed use Commercial and Irrigation Seasonality: Year-round commercial and seasonal irrigation (3/1through 10/31).

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	MULT 78361	1	Alluvium	0.12	T1N/R2E-29 SE-SE	860' N, 230' W fr SE cor S29 (see comments)

* 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	205	235	155	03/18/2013	278	0-22	+1-278		267-278	90		Air

Use data from application for proposed wells.

A4. **Comments:** A metes and bounds location description for the proposed POA, existing well MULT 78361, was not provided with the application. However, MULT 78361 is also one of two authorized POAs for permit G-15987, "Well 2" based on the location description provided with that permit. The metes and bounds description estimated here in Table A3 is based on this application's location map, and generally agrees with the "Well 2" location description provided in permit G-15987.

The existing permit for MULT 78361, permit G-15987, is for irrigation of 1.6 acres at a maximum instantaneous pumping rate of 0.02 cfs. The POU's for permit G-15987 and this application cover approximately the same area. However, according to the applicant "this application is for a water right at the typical annual rate of 2.5 acre-feet per acre, but at a higher instantaneous rate to match the current irrigation system capacity of 0.12 cfs as this system was designed for high pressure sprinkler irrigation over short periods of time." "This approach was discussed with Tim Wallin at OWRD in order to meet the needs of the applicant."

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: Although the proposed POA will produce groundwater from an unconfined aquifer, it is not located within 1/4 mile of a surface water source, and therefore the pertinent Willamette Basin rules (OAR 690-502-0240) do not apply.

A6. Well(s) # _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction. Name of administrative area: Not applicable. Comments: Not applicable.

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) Medium water-use reporting, 7C (7-yrs measurements);
 - 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 Troutdale Gravel groundwater reservoir between approximately 100 ft. and 500 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, MULT 78361, obtains groundwater from the Troutdale Gravel Aquifer (Gannett and Caldwell, 1998; Morgan and McFarland, 1996). Elsewhere in the Portland Basin the TGA is a heavily-exploited groundwater resource. However, in this particular area, large-scale groundwater usage from the TGA and other alluvial aquifers appears to be relatively limited. An exception is the presence of two irrigation wells at the Rose City Golf Course located approximately ½ to ¾ miles northwest of the proposed POA.

Although recharge rates to the alluvial aquifer system are relatively high (Swanson and others, 1993) and local pumpage appears to be fairly low, sparse groundwater level data for this area precludes being able to make a definitive conclusion related to groundwater availability for the proposed use. Therefore, if a permit is granted, reporting and monitoring conditions are recommended to allow for future evaluation of the groundwater resource in this area.

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	Alluvium (Troutdale Gravel Aquifer)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer confinement evaluation: 1) Groundwater levels reported for the proposed POA (MULT 78361) and other similar nearby wells are approximately coincident with the depths of the primary water-bearing deposits; and 2) there are no significant confining units shown on nearby well logs. These facts indicate generally unconfined aquifer conditions.

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?			Potential for Subst. Interfer. Assumed?	
						YES	NO	ASSUMED	YES	NO
1	1	Columbia Slough	50	10	11,300	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: Water table maps for the area indicate that groundwater in the alluvial aquifer system flows towards and discharges into local streams incised in the alluvial deposits (Woodward and others, 1998); this flow direction is substantiated by the gradient implicit in the relative groundwater and surface water elevations shown in Table C2. These facts indicate that the alluvial aquifer and SW1 (Columbia Slough) are hydraulically connected.

Water Availability Basin the well(s) are located within: Willamette River > Columbia River – at mouth (WID 181)

(NOTE: the proposed POA is located within this WAB (WID 181); however, SW1 (Columbia Slough) is not within this WAB, but was evaluated in C2 because it is much closer than the nearest surface water source associated with WID 181, which is the mainstem Willamette River located approximately 22,000 ft (~4.2 miles) to the west).

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?
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<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: C3a and C3b: not applicable

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
1	1	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS		0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Interference CFS		0.000	0.000	0.001	0.002	0.004	0.006	0.008	0.010	0.012	0.015	0.017	0.019
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:

The Hunt 1999 stream depletion analytical model (Hunt, 1999) was used to estimate interference of SW1 (Columbia Slough) after one year of pumping the proposed POA at the maximum requested allocation. Using aquifer parameter values from applicable reports and from a pumping test conducted at nearby MULT 1222, the estimated monthly stream interference values are provided in Table C4a. However, because a WAB has not been established for SW1, pumping interference as a percentage of natural stream flow could not be evaluated.

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:** As shown on Table C4a, pumping interference with waters of the Columbia Slough is expected to be very low within one year of continuous pumping. However, with additional time interference will increase until a new equilibrium between local recharge and discharge is reached, after which time stream depletion is expected to be relatively constant throughout the year.

References Used:

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

Hunt, B., 1999, Unsteady stream depletion from ground water pumping: Ground Water, v. 37, no. 1, p. 98-102.

Morgan, D.S., and McFarland, W.D., 1996, Simulation analysis of the ground-water flow system in the Portland Basin, Oregon and Washington: U.S. Geological Survey Water-Supply Paper 2470-B, 83 p.

Swanson, R.D., McFarland, W.D., Gonthier, J.B., and Wilkinson, J.M., 1993, A description of hydrogeologic units in the Portland basin, Oregon and Washington: U.S. Geological Survey Water-Resources Investigations Report 90-4196, 56p.

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:** _____

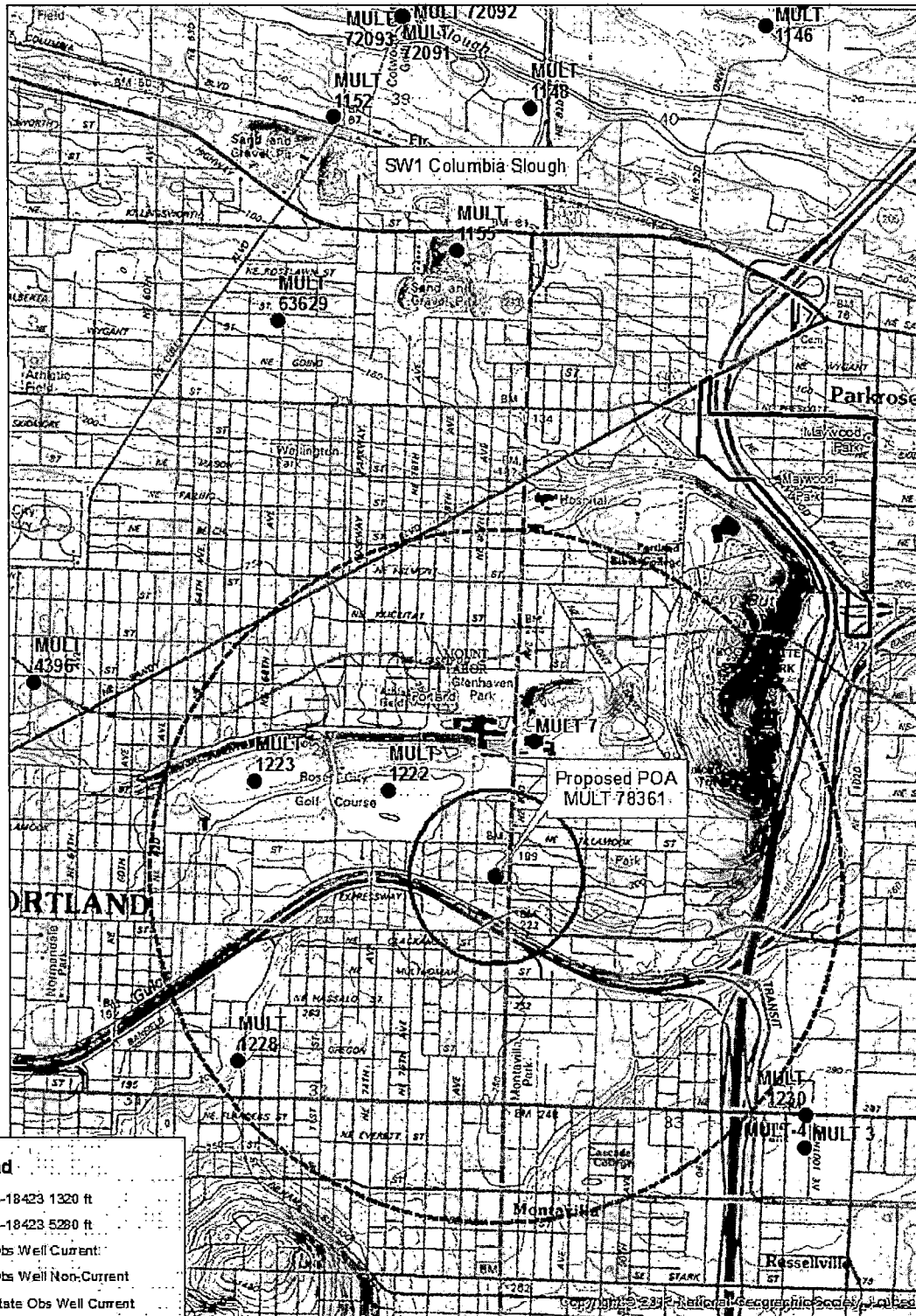
D4. Route to the Well Construction and Compliance Section for a review of existing well construction.

Water Availability Table – WID 181

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	27,500.00	2,740.00	24,800.00	0.00	1,500.00	23,300.00
FEB	30,000.00	0,010.00	22,000.00	0.00	1,500.00	20,500.00
MAR	26,500.00	7,570.00	20,900.00	0.00	1,500.00	19,400.00
APR	25,400.00	7,170.00	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	2,340.00	8,660.00	0.00	1,500.00	7,160.00
JUL	6,200.00	2,290.00	3,950.00	0.00	1,500.00	2,450.00
AUG	4,690.00	2,040.00	2,650.00	0.00	1,500.00	1,350.00
SEP	4,930.00	1,680.00	3,250.00	0.00	1,500.00	1,750.00
OCT	5,590.00	709.00	5,260.00	0.00	1,500.00	3,760.00
NOV	12,700.00	1,000.00	11,700.00	0.00	1,500.00	10,200.00
DEC	24,800.00	1,390.00	23,400.00	0.00	1,500.00	21,900.00
ANN	19,700,000.00	2,490,000.00	17,300,000.00	0.00	1,090,000.00	16,200,000.00

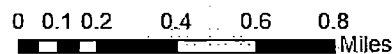
Well Location Map

G-18423 Banfield Pet Hospital



Legend

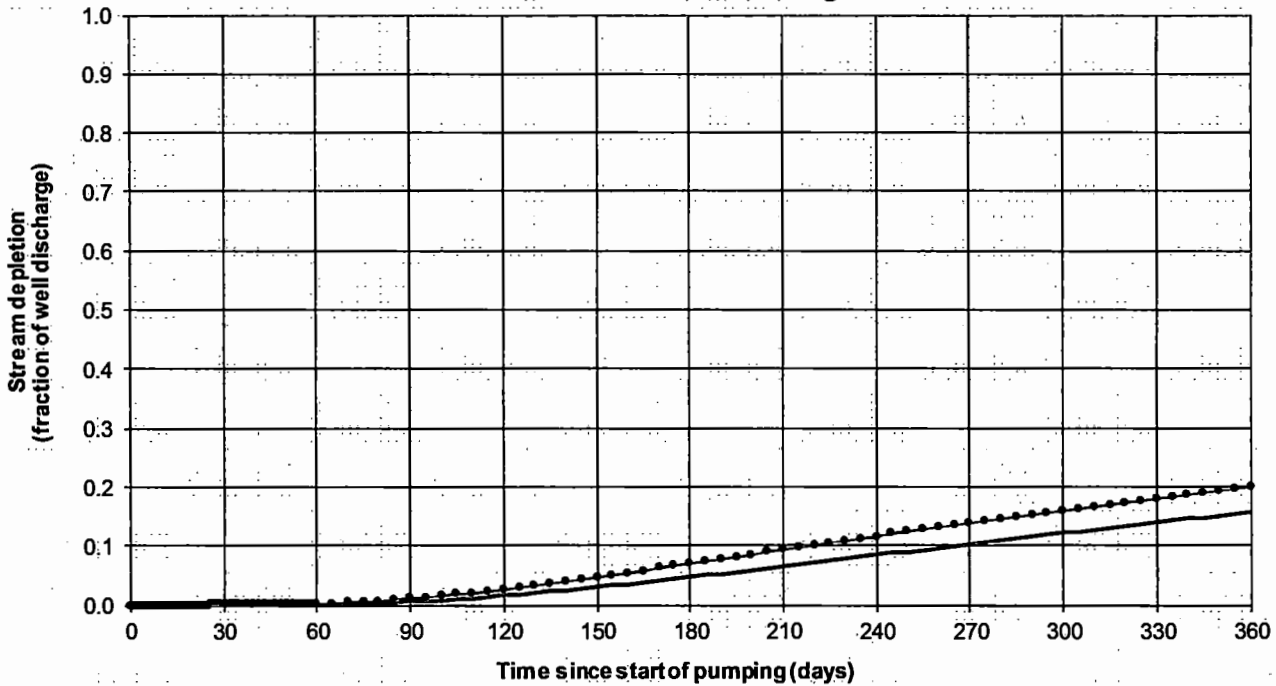
- G-18423 1320 ft
- G-18423 5280 ft
- Obs Well Current
- Obs Well Non-Current
- State Obs Well Current
- State Obs Well Non-Current
- Other Wells
- Water Availability Basins



Hunt 1999 Stream Depletion Model Results

Transient Stream Depletion (Jenkins, 1970; Hunt, 1999)

MULT 78361-Columbia Slough



Output for Hunt Stream Depletion, Scenerio 2 (s2): Time pump on = 365 days

Days	30	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.120
Jenk SD s2 %	0.00	0.17	1.02	2.62	4.67	6.95	9.28	11.59	13.83	15.97	18.00	19.93
Jen SD s2 cfs	0.000	0.000	0.001	0.003	0.006	0.008	0.011	0.014	0.017	0.019	0.022	0.024
Hunt SD s2 %	0.00	0.07	0.54	1.55	2.98	4.68	6.52	8.40	10.29	12.14	13.94	15.67
Hunt SD s2 cfs	0.000	0.000	0.001	0.002	0.004	0.006	0.008	0.010	0.012	0.015	0.017	0.019

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	0.12	0.12	0.12	cfs
Distance to stream	a	11300	11300	11300	ft
Aquifer hydraulic conductivity	K	50	175	1000	ft/day
Aquifer thickness	b	123	123	123	ft
Aquifer transmissivity	T	6150	21525	123000	ft ² /day
Aquifer storage coefficient	S	0.2	0.2	0.2	
Stream width	ws	100	100	100	ft
Streambed hydraulic conductivity	Ks	0.1	1	1	ft/day
Streambed thickness	bs	3	3	3	ft
Streambed conductance	sbc	3.333333333	33.33333333	33.33333333	ft/day
Stream depletion factor (Jenkins)	sdf	4152.520325	1186.434379	207.6260163	days
Streambed factor (Hunt)	sbf	6.124661247	17.49903213	3.062330623	