WATER RESOURCES DEPARTMENT

MEMO **17 June ,2015**

TO: **Application G-17983**

FROM: **GW: Gerald H. Grondin**
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

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

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

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

☐ 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 **Klamath River** 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

SEE ATTACHED MEMO

State of Oregon
Water Resources Department

Memorandum

To: Barry Norris – Administrator, Technical Services Division
Dwight French – Administrator, Waterights Division
Tom Paul – Deputy Director
Doug Woodcock – Administrator, Field Services Division

From: Ivan Gall – Manager, Groundwater Section

Date: February 19, 2013

Subject: Analysis of Groundwater Pumping Impacts on Klamath Scenic Waterway Flows

In 1971 the Oregon Legislature created the Scenic Waterway Act, codified by Oregon Revised Statutes 390.805 to 390.925, to preserve for the benefit of the public Waldo Lake and selected parts of the state's free-flowing rivers. The Klamath Scenic Waterway was part of the Act and includes the Klamath River from the John Boyle Dam powerhouse downstream to the Oregon-California border. Under the Act, the Water Resources Commission is allowed to allocate small amounts of surface water for human consumption and livestock watering, as long as issuing the water right does not significantly impair the free-flowing character of these waters in quantities necessary for recreation, fish and wildlife, and the amount allocated may not exceed a cumulative total of one percent of the average daily flow or one cubic foot per second (cfs), whichever is less.

In 1995 the Scenic Waterway Act was modified to address the impact of groundwater uses that, based upon a preponderance of evidence, would measurably reduce the surface water flows within a scenic waterway. "Measurably reduce" means that the use authorized will individually or cumulatively reduce surface water flows within the scenic waterway in excess of a combined cumulative total of one percent of the average daily flow or one cfs, whichever is less.

In 2012 the United States Geological Survey (USGS), in cooperation with OWRD and the US Bureau of Reclamation, completed groundwater flow and management models for the Upper Klamath Basin. The 2012 groundwater flow model uses generally accepted hydrogeologic methods and the relevant field data to model the cumulative effects of groundwater pumping within the Klamath Scenic Waterway, and provides a comprehensive methodology for analyzing the relevant field data necessary to determine whether the cumulative use of groundwater in the Klamath Basin will measurably reduce the surface water flow necessary to maintain the free-flowing character of the Klamath Scenic Waterway.

In September 2012 the OWRD Groundwater Section conducted two model simulations. The two simulations used the 2012 USGS flow model, incorporating groundwater permits issued (61.96 cfs) since adoption of the 1995 Scenic Waterway Act amendment up through 2004. Each simulation was run to steady-state, where inflows and outflows for that model run balanced. An evaluation of the water budgets showed that groundwater discharge to the Klamath Scenic Waterway decreased by 5.88 cfs as a result of the 61.96 cfs of groundwater uses issued between 1995 and 2004. These results indicate to the OWRD that a preponderance of evidence exists to establish that groundwater development occurring in the Upper Klamath Basin in Oregon since 1995 has "measurably reduced" surface water flows within the Klamath Scenic Waterway.

In January 2013 the OWRD Groundwater Section conducted flow model simulations to evaluate impacts to streams from pumping groundwater within the Lost River subbasin. Groundwater pumping was simulated by placing wells in the model that correspond to the center of 39 townships in the southeast part of the Klamath Basin in Oregon. Each of the simulations was run to steady-state, where inflows and outflows for that model run balanced. These results indicate that the scenic waterway is impacted by pumping groundwater in all of the townships evaluated in Oregon in the Lost River subbasin. In summary, a preponderance of evidence exists to establish that groundwater development occurring in Oregon since 1995 in the Upper Klamath Basin and Lost River subbasin has "measurably reduced" surface water flows within the Klamath Scenic Waterway.

References:

Gannett, M.W., Lite, K.E., Jr., La Marche, J.L., Fisher, B.J., and Polette, D.J., 2007. Ground-water hydrology of the upper Klamath Basin, Oregon and California: U.S. Geological Survey Scientific Investigations Report 2007-5050, 84p.

Gannett, M.W., Wagner, B.J., and Lite, K.E., Jr., 2012. Groundwater simulation and management models for the upper Klamath Basin, Oregon and California: U.S. Geological Survey Scientific Investigations Report 2012-5062, 92p.

PUBLIC INTEREST REVIEW FOR GROUND WATER APPLICATIONS

TO: Water Rights Section **Date** **17 June 2015**

FROM: Ground Water/Hydrology Section **Gerald H. Grondin**
Reviewer's Name

SUBJECT: Application **G-17983** 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 ground water 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: **Jeld-Wen, Inc.** County: **Klamath**

A1. Applicant(s) seek(s) **(825 gpm) 1.84** cfs from **1** well(s) in the **Klamath** Basin, **Upper Klamath Lake** sub basin Quad Map: **Wocus & Klamath Falls quads**

A2. Proposed use: **Industrial / Manufacturing** Seasonality: **Year Round (365 days)**
Proposed use: **Primary Irrigation (19.5 acres)** Seasonality: **Irrigation Season (245 days: 1 Mar to 31 Oct)**

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	**KLAM 11674**	**1**	**Basalt**	**1.84**	**38S/09E-sec 19 ACC**	**30' N, 2215' W fr E qtr cor S 19**
2						

* 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	**4155**	**9**	**7.83**	**03/10/15**	**1021**	**0-237.5**	**+1-237.5**	**None**	**None**	**1700**	**153**	**P**

Use data from application for proposed wells.

A4. **Comments:**

The proposed limited license use is 224 gpm (0.50 cfs) for year round industrial-manufacturing

This proposed POA well is related to other water rights:
File G-10815: 2.228 cfs for pollution abatement (reduce algae in harbor inlets sub-division channels)
File G-11550: 0.6684 cfs for primary irrigation of 75.8 acres
File G-11550: 0.52 cfs for primary irrigation of 41.7 acres
File LL-1540: 0.50 cfs for industry/manufacturing

The proposed POA well is 2,290 feet from Upper Klamath Lake which is within a scenic waterway area. The driller reported static water level is about the same as the lake level.

This reviewer is not aware of any proposed mitigation to offset the proposed use upon Upper Klamath Lake which is above the Klamath River Scenic Waterway.

A5. ☐ **Provisions of the N.A.** Basin rules relative to the development, classification and/or management of ground water hydraulically connected to surface water ☐ **are**, *or* ☐ **are not**, activated by this application. (Not all basin rules contain such provisions.)
Comments: **No basin rule applies. Only the Klamath River Compact ORS 542.610 to 542.630 applies to the Klamath Basin. However, that compact applies to surface water only, not ground water**

A6. ☐ **Well(s) # N.A.** , _____ , _____ , _____ , _____ , tap(s) an aquifer limited by an administrative restriction.
Name of administrative area: _____
Comments: **Currently, no administrative area.**

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

B1. **Based upon available data**, I have determined that ground water* 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 ground water 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 ground water 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 ground water resource; or

d. ☒ **will, if properly conditioned**, avoid injury to existing ground water rights or to the ground water resource:
   i. ☒ The permit should contain condition #(s) **7B, 7N, 7P, 7T, and "Large" flow meter condition with a totalizing flow meter on the main discharge pipe closest to the well and a totalizing flow meter on the pipe to the storage tank(s) that supplies water to the manufacturing plants and irrigated acres.**
   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 ground water production from no deeper than _____ ft. below land surface;

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

c. ☐ **Condition** to allow ground water production only from the _____ ground water 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 Ground Water 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. **Ground water availability remarks:** _____

If a permit is issued, recommend conditions 7B, 7N, 7P, 7T, and "Large" flow meter condition with a totalizing flow meter on the main discharge pipe closest to the well and a totalizing flow meter on the pipe to the storage tank(s) that supplies water to the manufacturing plants and irrigated acres, and specify the condition 7N groundwater reference level at KLAM 11674 as 8.00 feet below land surface.

Data from the eastern Lost River sub-basin ground water investigation (Grondin, 2004) and the USGS-OWRD cooperative Upper Klamath Basin ground water investigation by Gannett and others (2007) indicate basin long-term ground water levels are generally controlled by climate and short-term (seasonal) ground water levels are controlled by ground water use.

Additionally, the USGS (2005) and Gannett and others (2007) has documented annual water level declines in the basin south of Upper Klamath Lake since 2001. The declines are greater than typically observed during drought periods. They appear related to the USBOR Klamath Project Water Bank.

Further, the USGS-OWRD cooperative Upper Klamath Basin ground water investigation by Gannett and others (2007) has also found an exception to the basin-wide ground water level trends at wells in the vicinity of Upper Klamath Lake. Ground water levels at these wells are highly influenced by lake levels. That appears to include the applicant's area as evidenced by the OWRD groundwater level data for well KLAM 50315 located about 0.8 miles south of the proposed POA well site and for well KLAM 11656 located about 0.9 miles northeast of the proposed POA well site.

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

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

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	**Predominantly Volcanic-Basalt unit**	☐	☒
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation:

System is identified as generally unconfined with discontinuous low permeability layers causing local (discontinuous, limited) confinement. Generally, low transmissivity (low permeability) sediment (predominantly basin-fill sediment unit) of varying thickness overlies high transmissivity (high permeability) basalt (predominantly volcanic-basalt unit). Groundwater occurs in both the basin-fill and volcanic-basalt units. Groundwater is hydraulically connected vertically within each unit and between the units.

The water well report (well log) for the proposed POA well indicates the predominance of-basalt begins at 223 feet below land surface at this well site.

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**	**Upper Klamath Lake**	**4147**	**4143**	**2,370**	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation:

A connection to Upper Klamath Lake is very likely given the discussion below.

The eastern Lost River sub-basin ground water investigation data(Grondin, 2004) and the USGS-OWRD cooperative Upper Klamath Basin ground water investigation by Gannett and others (2007) indicate low yield (low hydraulic conductivity) sediments overlie higher yield (high conductivity) basalt. Many domestic wells produce from the sediments and most irrigation wells produce from the basalt. Ground water in the sediments and the basalt appear hydraulically connected. The data include similar or small differences between basalt and sedimentary ground water levels and data showing ground water levels at wells completed in the sediments responding to pumping ground water from basalt.

In addition to the hydraulic connection between basalt and the overlying sediments, the USGS-OWRD cooperative Upper Klamath Basin ground water investigation by Gannett and others (2007) has found ground water level trends at wells in the vicinity of Upper Klamath Lake are highly influenced by lake levels rather than following the general basin-wide annual and seasonal ground water level trends. The lake influenced ground water should include the applicant's area as evidenced by the OWRD groundwater level data for well KLAM 50315 located about 0.8 miles south of the proposed POA well site and for well KLAM 11656 located about 0.9 miles northeast of the proposed POA well site and the static groundwater level for the proposed POA well is similar to the mapped Upper Klamath Lake level.

Water Availability Basin the well(s) are located within: LINK R > KLAMATH R - AB UNN STR

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**	☐	☐	**multiple**	**20.00**	☒	**808**	☐	**45.2**	☒
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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:

Proposed well site is less than 1 mile to Upper Klamath Lake.

There are multiple in-stream water rights: KA484A, KA553A, KA558A, KA472A, KA545A, KA490A, IS70813A

Hunt (2003) was used to calculate the interference at Upper Klamath Lake given the proposed POA well does penetrate the sediments to obtain groundwater from the basalt below. The unit thicknesses, the Transmissivity used (17,525 ft2/day) and the vertical hydraulic conductivity for the overlying unit is based upon USGS analysis of the thickness of the local hydrogeologic units and their hydraulic properties. A conservative 1,000 foot lake width was used for the calculation.

A potential for substantial interference is assume given the following: the proposed pumping rate is greater than one-percent of the total in-stream water rights (cfs), and the interference at Upper Klamath Lake at the end of 30 days pumping is 45.2 percent of the pumping rate (the interference is independent of the pumping rate).

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

Non-Distributed Wells

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

Distributed Wells

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

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

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

Basis for impact evaluation: ______________________________

No analysis here given the proposed well site is less than 1 mile to Upper Klamath Lake.

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 ground water 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**_____

A potential for substantial interference is assume given the following: the proposed pumping rate is greater than one-percent of the total in-stream water rights (cfs), and the interference at Upper Klamath Lake at the end of 30 days pumping is 45.2 percent of the pumping rate (the interference is independent of the pumping rate).

This reviewer is not aware of any proposed mitigation to offset the proposed use upon Upper Klamath Lake which is above the Klamath River Scenic Waterway.

If a permit is issued, recommend conditions 7B, 7N, 7P, 7T, and "Large" flow meter condition with a totalizing flow meter on the main discharge pipe closest to the well and a totalizing flow meter on the pipe to the storage tank(s) that supplies water to the manufacturing plants and irrigated acres, and specify the condition 7N groundwater reference level at KLAM 11674 as 8.00 feet below land surface.

The proposed POA well (KLAM 11674) is hydraulically connected with Upper Klamath Lake and is located 2,290 feet from Upper Klamath Lake. The lake and well site are within and/or above the Klamath River scenic waterway area.

The groundwater system is identified as generally unconfined with discontinuous low permeability layers causing local (discontinuous, limited) confinement. Generally, low transmissivity (low permeability) sediment (predominantly basin-fill sediment unit) of varying thickness overlies high transmissivity (high permeability) basalt (predominantly volcanic-basalt unit). Groundwater occurs in both the basin-fill and volcanic-basalt units. Groundwater is hydraulically connected vertically within each unit and between the units.

The eastern Lost River sub-basin ground water investigation data (Grondin, 2004) and the USGS-OWRD cooperative Upper Klamath Basin ground water investigation by Gannett and others (2007) indicate low yield (low hydraulic conductivity) sediments overlie higher yield (high conductivity) basalt. Many domestic wells produce from the sediments and most irrigation wells produce from the basalt. Ground water in the sediments and the basalt appear hydraulically connected. The data include similar or small differences between basalt and sedimentary ground water levels and data showing ground water levels at wells completed in the sediments responding to pumping ground water from basalt.

In addition to the hydraulic connection between basalt and the overlying sediments, the USGS-OWRD cooperative Upper Klamath Basin ground water investigation by Gannett and others (2007) has found ground water level trends at wells in the vicinity of Upper Klamath Lake are highly influenced by lake levels rather than following the general basin-wide annual and seasonal ground water level trends whereby long-term groundwater levels are generally controlled by climate and short-term (seasonal) groundwater levels are controlled by ground water use. The lake influenced groundwater should include the applicant's area as evidenced by the OWRD groundwater level data for well KLAM 50315 located about 0.8 miles south of the proposed POA well site and for well KLAM 11656 located about 0.9 miles northeast of the proposed POA well site and the static groundwater level recorded on the water well report for the proposed POA well which is similar to Upper Klamath Lake level.

References Used:

Gannett, M.W., Lite, K.E., La Marche, J.L., Fisher, B.J., and Polette, D.J., 2007. Ground-Water Hydrology of the Upper Klamath Basin, Oregon and California. USGS Scientific Investigations Report 2007-5050.

Gannett, M.W., Wagner, B.J., and Lite, K.E. 2012. Groundwater Simulation and Management Models for the Upper Klamath Basin, Oregon and California. USGS Scientific Investigations Report 2012-5062.

Grondin, G.H., 2004. Ground Water in the Eastern Lost River Sub-Basin, Langell, Yonna, Swan Lake, and Poe Valleys of Southeastern Klamath County, Oregon. Ground Water Report 41, Oregon Water Resources Department, Salem, Oregon.

USGS, 2005. Assessment of the Klamath Project pilot water bank: a review from a hydrologic perspective. Prepared by the U.S. Geological Survey Oregon Water Science Center, Portland, Oregon for the U.S. Bureau of Reclamation Klamath Basin Area Office, Klamath Falls, Oregon, May 3, 2005.

Leonard, A.R. and Harris, A.B. 1974. Ground water in selected areas in the Klamath Basin, Oregon. OWRD Ground Water Report No. 21, 104 pgs.

Hunt, B., 2003, Unsteady stream depletion when pumping from semiconfined aquifer: Journal of Hydrologic Engineering, January/February, 2003.

Theis, C.V. 1935. The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using ground water storage. American Geophysical Union Transactions, 16 annual meeting, vol. 16, pg. 519-524.

Water level data for wells KLAM 50315 & KLAM 11656 & KLAM 11674

USGS Wocus and Klamath Falls quadrangle maps (1:24,000 scale)

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #**: **1** **Logid: KLAM 11674**

D2. **THE WELL does not 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**:
- a. ☐ constitutes a health threat under Division 200 rules;
- b. ☐ commingles water from more than one ground water reservoir;
- c. ☐ permits the loss of artesian head;
- d. ☐ permits the de-watering of one or more ground water reservoirs;
- e. ☐ other: (specify) _____

D4. **THE WELL construction deficiency is described as follows:** _____

D5. **THE WELL**
- a. ☒ **was**, *or* ☐ **was not** constructed according to the standards in effect at the time of original construction or most recent modification.
- b. ☐ I don't know if it met standards at the time of construction.

D6. ☐ **Route to the Enforcement Section.** I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Enforcement Section and the Ground Water Section.

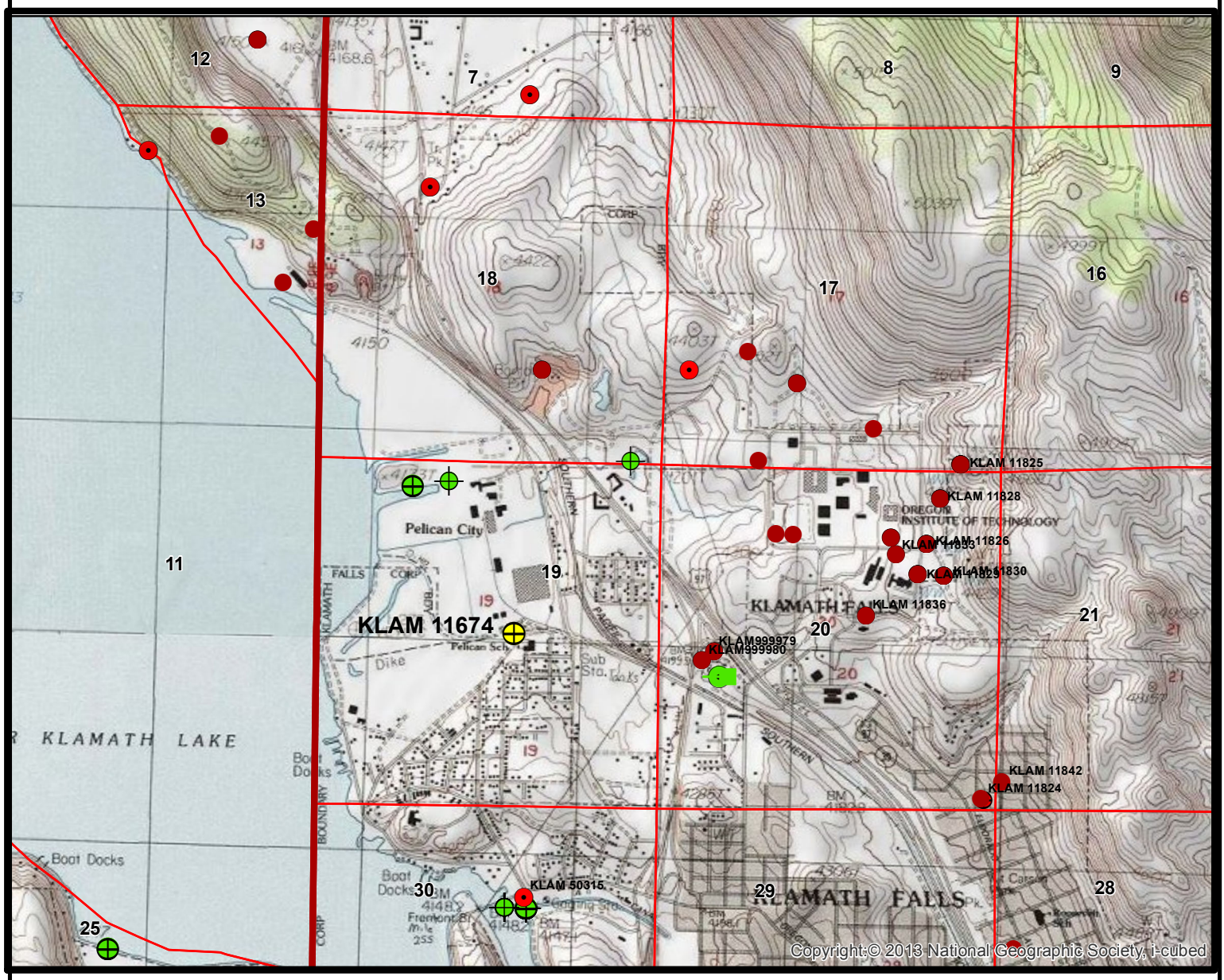
THIS SECTION TO BE COMPLETED BY ENFORCEMENT PERSONNEL

D7. ☐ Well construction deficiency has been corrected by the following actions: _____

_____ _____, 200____.
(Enforcement Section Signature)

D8. ☐ **Route to Water Rights Section (attach well reconstruction logs to this page).**

Groundwater Permit Application G-17983
Jeld-Wen Inc.



0 0.25 0.5 1 1.5 2
Miles

Yellow = Related POA Wells
Red & Blue = Other Wells

Green = Surface Water Rights

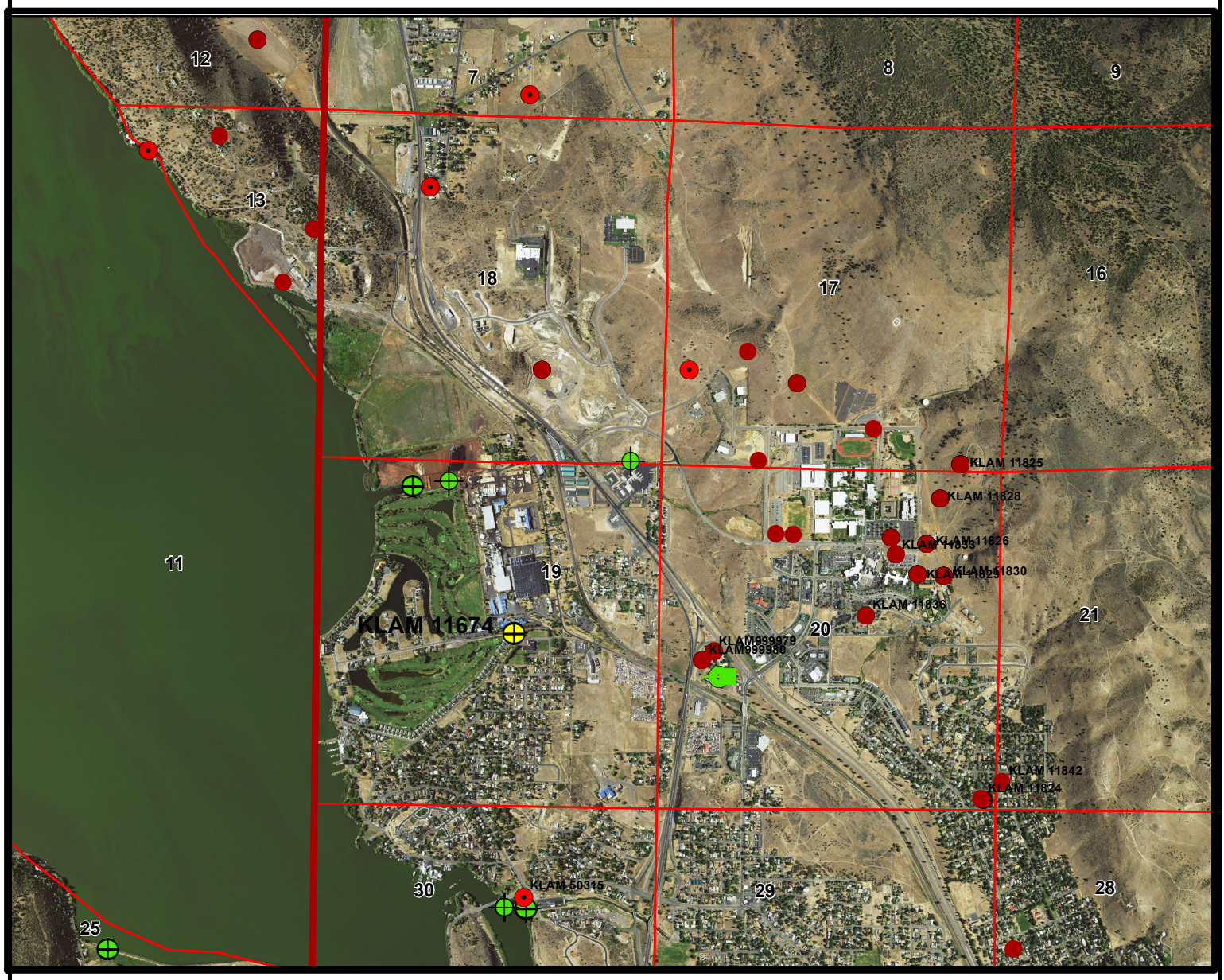
N

Legend

Townships

Sections

Groundwater Permit Application G-17983
Jeld-Wen Inc.



0 0.25 0.5 1 1.5
Miles

Legend
- Townships
- Sections

NAIP 2014 imagery
RGB
- Red: Band_1
- Green: Band_2
- Blue: Band_3

Yellow = Related POA Wells
Red & Blue = Other Wells

Green = Surface Water Rights

N

WATER WELL REPORT
STATE OF OREGON

KLAM 11674

RECEIVED
NOV 4 1981
WATER RESOURCES DEPT
SALEM, OREGON

State Well No. 38S/9E-19 ba

State Permit No.

(1) OWNER:
Name JELD/WEN INC.
Address 3303 LAKE ROAT BLVD.
City KLAMATH FALLS State OREGON

(2) TYPE OF WORK (check):
New Well [X] Deepening [ ] Reconditioning [ ] Abandon [ ]
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary Air [ ] Driven [ ]
Rotary Mud [X] Dug [ ]
Cable [ ] Bored [ ]

(4) PROPOSED USE (check):
Domestic [ ] Industrial [X] Municipal [ ]
Irrigation [ ] Test Well [ ] Other [ ]
Thermal: [ ] Withdrawal [ ] Reinjection [ ]

(5) CASING INSTALLED:
Steel [X] Plastic [ ]
Threaded [ ] Welded [ ]
12 3/4" Diam. from +1 ft. to 237 1/2 ft. Gauge .250
" Diam. from ft. to ft. Gauge

LINER INSTALLED:
" Diam. from ft. to ft. Gauge

(6) PERFORATIONS:
Perforated? [ ] Yes [X] No
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? [ ] Yes [X] No
Manufacturer's Name
Type Model No.
Diam. Slot Size Set from ft. to ft.
Diam. Slot Size Set from ft. to ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? [X] Yes [ ] No If yes, by whom? VALLEY PUMP
1700 gal./min. with 153 ft. drawdown after 4 hrs.
" " " "
Air test gal./min. with drill stem at ft. hrs.
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 62° Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Special standards: Yes [ ] No [X]
Well seal—Material used CEMENT
Well sealed from land surface to 237 1/2 ft.
Diameter of well bore to bottom of seal 17 1/2 in.
Diameter of well bore below seal 9 7/8 in.
Number of sacks of cement used in well seal 300 sacks
How was cement grout placed? PUMPED
Was pump installed? Type HP Depth ft.
Was a drive shoe used? [X] Yes [ ] No Plugs Size: location ft.
Did any strata contain unusable water? [ ] Yes [X] No
Type of Water? depth of strata
Method of sealing strata off
Was well gravel packed? [ ] Yes [X] No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County KLAMATH Driller's well number
NE ¼ NW ¼ Section 19 T. 38S R. 9E W.M.
Tax Lot # Lot Blk Subdivision
Address at well location:

(11) WATER LEVEL: Completed well.
Depth at which water was first found 9 ft.
Static level 14 ft. below land surface. Date 10/7/81
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 9 7/8
Depth drilled 1021 ft. Depth of completed well 1003 ft.
Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
SEE ATTACHED COPY FOR DRILLING LOG			

Work started 9/21 19 81 Completed 10/7 19 81
Date well drilling machine moved off of well 10/16 19 81

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] (Drilling Machine Operator) Date 11/2, 19 81
Drilling Machine Operator's License No. 656

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name E E STOREY & SON WELL DRILLING INC (Person, firm or corporation) (Type or print)
Address 3847 HOPE ST KLAMATH FALLS
[Signed] (Water Well Contractor)
Contractor's License No. 601 Date 11/2, 19 81

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the

WATER RESOURCES DEPARTMENT,
SALEM, OREGON 97310
within 30 days from the date of well completion.

SP*12658-690

38S/9E-19ba
Klamath

RECEIVED
NOV 4 1981
WATER RESOURCES DEPT
SALEM, OREGON

E.E. STOREY & SON WELL DRILLING, INC.

3847 HOPE STREET - KLAMATH FALLS, OREGON 97601
503/884-3990 or 503/882-1152
CONTRACTOR'S LICENSES - ORE. 74 and 601

OREGON MEMBER DRILLERS ASS'N. INC.

JELD-WEN, INC.
3303 LAKEPORT BLVD.
KLAMATH FALLS, OREGON 97601
NE¼ NW¼ S19 T38S R9E
COLD WATER WELL ON LAKEPORT BLVD, BEHIND PLANT

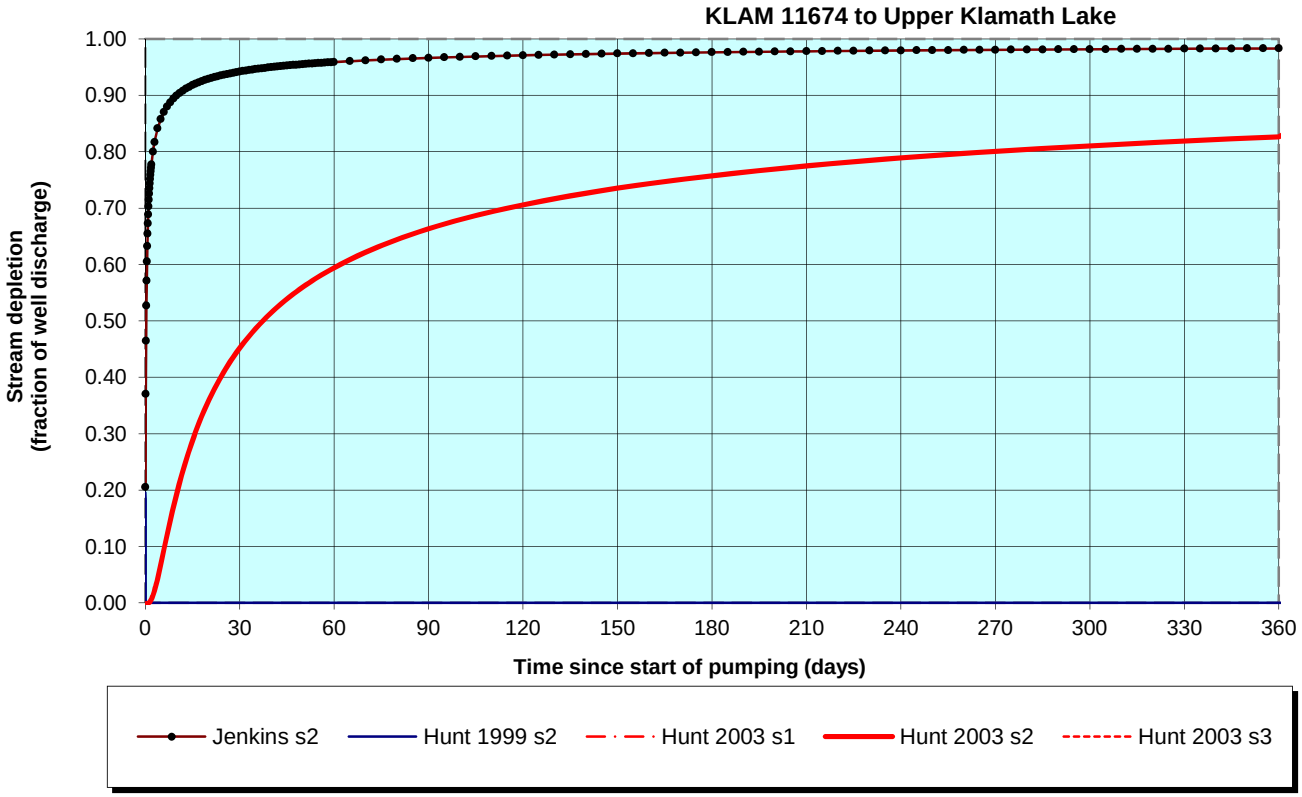
DAVE
STARTED 9/21/81
COMPLETED 10/7/81

LOG

0	-	5	brown clay topsoil
5	-	9	yellow shale
9	-	15	hard black sandstone
15	-	35	sticky blue clay
35	-	42	blue shale
42	-	76	green shale
76	-	97	hard green shale
97	-	156	hard gray shale
156	-	223	sticky brown clay
223	-	239	hard black basalt
239	-	252	black bubbly basalt
252	-	270	black lava
270	-	320	hard black basalt
320	-	365	broekn black lava
365	-	376	hard brown sandstone
376	-	440	green sticky clay
440	-	448	hard brown shale
448	-	486	green sticky clay
486	-	500	hard brown shale
500	-	565	green sticky clay
565	-	569	hard broekn black chalk rock
569	-	615	broken black basalt
615	-	639	hard black basalt
639	-	674	hard broken black basalt
674	-	785	hard black basalt
785	-	820	hard brown chalk rock
820	-	892	brown clay
892	-	962	gray clay
962	-	994	black shale with streaks of black clay
994	-	1021	hard black basalt

1003' taped finished hole depth after test pumping

Transient Stream Depletion (Jenkins, 1970; Hunt, 1999, 2003)



Output for Stream Depletion, Scenerio 2 (s2):						Time pump on (pumping duration) = 365 days						
Days	30	60	90	120	150	180	210	240	270	300	330	360
J SD	94.2%	95.9%	96.6%	97.1%	97.4%	97.6%	97.8%	97.9%	98.1%	98.2%	98.2%	98.3%
H SD 1999	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
H SD 2003	45.2%	59.4%	66.3%	70.6%	73.5%	75.8%	77.5%	78.9%	80.1%	81.0%	81.9%	82.7%
Qw, cfs	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
H SD 99, cfs	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
H SD 03, cfs	0.145	0.190	0.212	0.226	0.235	0.242	0.248	0.252	0.256	0.259	0.262	0.264

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate of well	Qw	0.32	0.32	0.32	cfs
Time pump on (pumping duration)	tpon	365	365	365	days
Perpendicular from well to stream	a	2370	2370	2370	ft
Well depth	d	1003	1003	1003	ft
Aquifer hydraulic conductivity	K	7.6195	7.6195	7.6195	ft/day
Aquifer saturated thickness	b	2300	2300	2300	ft
Aquifer transmissivity	T	17524.85	17524.85	17524.85	ft*ft/day
Aquifer storativity or specific yield	S	0.001	0.001	0.001	
Aquitard vertical hydraulic conductivity	Kva	28.4727	28.4727	28.4727	ft/day
Aquitard saturated thickness	ba	44	44	44	ft
Aquitard thickness below stream	babs	44	44	44	ft
Aquitard porosity	n	0.1	0.1	0.1	
Stream width	ws	1000	1000	1000	ft
Streambed conductance (lambda)	sbc	647.106818	647.106818	647.106818	ft/day
Stream depletion factor	sdf	0.320511	0.320511	0.320511	days
Streambed factor	sbf	87.512484	87.512484	87.512484	
input #1 for Hunt's Q_4 function	t'	3.120022	3.120022	3.120022	
input #2 for Hunt's Q_4 function	K'	207.404588	207.404588	207.404588	
input #3 for Hunt's Q_4 function	epsilon'	0.010000	0.010000	0.010000	
input #4 for Hunt's Q_4 function	lamda'	87.512484	87.512484	87.512484	