

WATER RESOURCES DEPARTMENT

MEMO

8 June, 2002

TO: Application G- 15565
FROM: GW: GERALD H. GRONBIN (Reviewer's Name)
SUBJECT: Scenic Waterway Interference Evaluation

Revised as requested
see pg 2
see pg 7

YES
[X] NO
The source of appropriation is within or above a Scenic Waterway

YES
[X] NO
Use the Scenic Waterway condition (Condition 7J)

Per ORS 390.835, the Ground Water Section is able to calculate ground water interference with surface water that contributes to a Scenic Waterway. The calculated interference is distributed below.

[X] Per ORS 390.835, the Ground Water 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 Scenic Waterway by the following amounts expressed as a proportion of the consumptive use by which surface water flow is reduced.

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec

**PUBLIC INTEREST REVIEW FOR GROUND WATER APPLICATIONS**

TO: Water Rights Section Date 8 June 2011

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

SUBJECT: Application G- 15565

Supersedes reviews of 30 March 2010 (drought, G-17323) &  
9 Feb 2005 & 31 March 2004 & 31 Aug 2001 (regular, G-15565)  
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: David & Marganne Oxley County: Klamath

A1. Applicant(s) seek(s) (1795 gpm) 4.00 cfs from 1 well(s) in the Klamath Basin,  
Upper Lost River subbasin Quad Map: Bonanza & Dairy quads (1:24,000 scale)

A2. Proposed use: 331.0 acres supplemental irrigation Seasonality: 1 March through 31 October (245 days)

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

| Well | Logid                                  | Applicant's Well # | Proposed Aquifer* | Proposed Rate(cfs) | Location (T/R-S QQ-Q)   | Location, metes and bounds, e.g. 2250' N, 1200' E fr NW cor S 36 |
|------|--|--------------------|-------------------|--------------------|-------------------------|--|
| 1    | <b>KLAM 52922</b><br><b>KLAM 53630</b> | 1                  | <b>Basalt</b>     | <b>4.00</b>        | <b>40S/11E-sec 3cac</b> | <b>3400 ft S, 1600 ft E from NW corner of section 3</b>          |
|      |  |                    |                   |                    |                         |  |
|      |  |                    |                   |                    |                         |  |

\* 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    | 4118             | 410                | 24         | 12/06/02 | 1175            | 0 - 238            | +1 - 238              | None                 | None                         | 3500             | ?              | air       |
|      |                  |                    |            |          |                 |                    |                       |                      |                              |                  |                |           |
|      |                  |                    |            |          |                 |                    |                       |                      |                              |                  |                |           |

Use data from application for proposed wells.

A4. Comments: \_\_\_\_\_

Proposed pumping rate (4.00 cfs, 1795 gpm) is less than the maximum allowed for 331.0 acres (4.14 cfs, 1,857 gpm).

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.

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 (modified), 7T (modified);
  - 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 issued, the permit should contain the following conditions:**

**7B, the interference condition;**

**7N, the measurement condition modified (modify part “C” to read “Annual water-level measurements reveal a water-level of 35 feet below land surface, 4083 ft elevation which is a decline of 25 or more feet below a reference level of 10 feet below land surface, 4108 ft elevation);” and add a part “E” to say “OWRD groundwater section approved static ground water level measurements at well KLAM 51131 is 50 or more feet below land surface, 4059 feet elevation, or the static ground water level measurements at well 50623 is 60 or more feet below land surface, 4059 feet elevation”);**

**7T, the measuring tube condition modified (add “For existing wells with a pump installed, installation of the measuring tube shall occur when the pump is removed or replaced and/or when the well is deepened or reconstructed or altered.”); and**

**The “large” water use condition (flow meter required).**

**The condition 7N language modification and adding part “E” is needed to prevent groundwater mining. Please see the discussion below.**

**The proposed well is located in Poe Valley within the south Poe Valley compartment of the Swan Lake Valley to Poe Valley sub-area of the upper Lost River sub-basin.**



**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    | Basalt                      | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|      |                             | <input type="checkbox"/> | <input type="checkbox"/>            |
|      |                             | <input type="checkbox"/> | <input type="checkbox"/>            |
|      |                             | <input type="checkbox"/> | <input type="checkbox"/>            |
|      |                             | <input type="checkbox"/> | <input type="checkbox"/>            |

Basis for aquifer confinement evaluation: \_\_\_\_\_

Current upper Lost River sub-basin ground water investigation data indicates low yield basin fill sediments overlie higher yielding basalt in the valleys. Local irrigation wells typically produce from the basalt. Ground water occurs in both the sediments and the basalt. Ground water in the basalt is hydraulically connected to ground water in the sediments making an unconfined aquifer with different hydraulic conductivities.

The basin fill sediment thickness varies greatly across the Swan Lake Valley to Poe Valley sub-area. The sediment thickness above the basalt at the proposed wells ranges from 410 feet to 875 feet. In other parts of the valley, the sediment thickness above the basalt is less than 10 feet.

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    | Lost River (south channel) | 4107           | 4092           | 6,350         | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>                | <input checked="" type="checkbox"/> |
|      |      |                            |                |                |               | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>                | <input type="checkbox"/>            |
|      |      |                            |                |                |               | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>                | <input type="checkbox"/>            |
|      |      |                            |                |                |               | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>                | <input type="checkbox"/>            |
|      |      |                            |                |                |               | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>                | <input type="checkbox"/>            |

Basis for aquifer hydraulic connection evaluation: \_\_\_\_\_

Current eastern Lost River sub-basin ground water investigation data indicates basalt ground water in the south Poe Valley compartment is hydraulically connected to the Lost River south channel through overlying low hydraulic conductivity sediments. The other Lost River reaches appear to be in different compartments.

The ground water elevation noted in the table above was derived from the 1999 OWRD ground water level synoptic measurements in the upper Lost River sub-basin. The 2002 driller submitted static groundwater level for the well deepening is lower, about 4094 feet elevation. This lower level is consistent with post-2000 ground water levels in the compartment being 10 to 15 feet lower than the pre-2000 ground water levels. This lower ground water level is due to post-2000 drought pumping causing a drawdown that has yet to recover.

The surface water elevation in the table above was derived from the March 1999 OWRD upper Lost River sub-basin synoptic water level measurements.

Water Availability Basin the well(s) are located within: Lost River Sub-Basin



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   |
| I                            | 1   | .011% | .012% | .000% | .001% | .001% | .002% | .003% | .005% | .006% | .007% | .009% | .010% |
| Well Q as CFS                |     | 0.00  | 0.00  | 2.04  | 2.04  | 2.04  | 2.04  | 2.04  | 2.04  | 2.04  | 2.04  | 0.00  | 0.00  |
| Interference CFS             |     | 0.022 | 0.024 | 0.001 | 0.002 | 0.003 | 0.005 | 0.007 | 0.010 | 0.012 | 0.015 | 0.018 | 0.020 |
| <b>Distributed Wells</b>     |     |       |       |       |       |       |       |       |       |       |       |       |       |
| 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             |     |       |       |       |       |       |       |       |       |       |       |       |       |
| (A) = Total Interf.          |     | 0.022 | 0.024 | 0.001 | 0.002 | 0.003 | 0.005 | 0.007 | 0.010 | 0.012 | 0.015 | 0.018 | 0.020 |
| (B) = 80 % Nat. Q            |     | 165.0 | 371.0 | 391.0 | 246.0 | 178.0 | 122.0 | 118.0 | 106.0 | 92.5  | 89.7  | 94.6  | 137.0 |
| (C) = 1 % Nat. Q             |     | 1.65  | 3.71  | 3.91  | 2.46  | 1.78  | 1.22  | 1.18  | 1.06  | 0.93  | 0.90  | 0.95  | 1.37  |
| (D) = (A) > (C)              |     | No    | No    | No    | No    | No    | No    | No    | No    | No    | No    | No    | No    |
| (E) = (A / B) x 100          |     | 0.013 | 0.006 | 0.000 | 0.001 | 0.002 | 0.004 | 0.006 | 0.009 | 0.013 | 0.017 | 0.019 | 0.015 |

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

This evaluation applies to the proposed well (KLAM 52922 & KLAM 53630) which is more than one-mile from the Lost River (south channel). It is within the south Poe Valley compartment that is hydraulically connected to a Lost River reach (south channel) via diffuse seepage through low hydraulic conductivity basin fill sediments.

For this evaluation, the Hunt (2003) model was used to assess the interference.

A pro-rated pumping rate was used for the calculation: pro-rated pumping rate = (total allowable volume for 331 acres) / (total pumping period) = 2.04 cfs (917 gpm).

The calculations used transmissivity and storage coefficient values derived from Grondin (2004) for the basalt in the south Poe Valley compartment. That investigation obtained an effective transmissivity of 7,260 ft<sup>2</sup>/d and storage coefficient of 0.000575 for the basalt in the compartment. The values include possible boundary influences and can be used to estimate drawdown in the compartment. In lieu of aquifer test data, the values were derived using early 2000 and 2001 drawdown data at recorder well KLAM 51131, ground water pumping data supplied to the Bureau of Reclamation, and graphical analyses (Theis log-log and Jacob-Copper semi-log). The semi-log graphs of the drawdown data indicate the presence of multiple no-flow boundaries. The values were obtained by using Theis equation calculations to reproduce the 2000 and 2001 drawdowns. The values yielded an estimated drawdown of 5.93 ft and 11.18 ft versus observed drawdown of 8.83 ft and 12.95 ft after 4.5 and 11.5 days of pumping respectively.





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.

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.

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.

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

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

Jenkins, C.T., 1970, Computation of rate and volume of stream depletion by wells: U.S. Geol. Survey Techniques of Water- Resources Investigations of the Unites States Geological Survey, Chapter D1, Book 4,17 p.

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.

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.

Theis, 1941, The effect of a well on the flow of a nearby stream: American Geophysical Union Trans., v. 22, pt. 3, p. 734-738.

Hydrographs and/or ground water level data for well KLAM 51131 and well KLAM 52922 (KLAM 53630 deepening)

USGS Bonanza and Dairy quadrangle maps (1:24,000 scale)

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

D1. Well #: 1 Logid: KLAM 52922 & KLAM 53630 (deepening)

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: N.A.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

D5. WELL KLAM 52922 a.  well 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: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

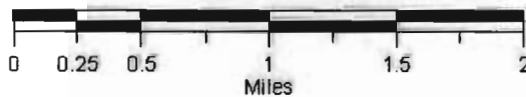
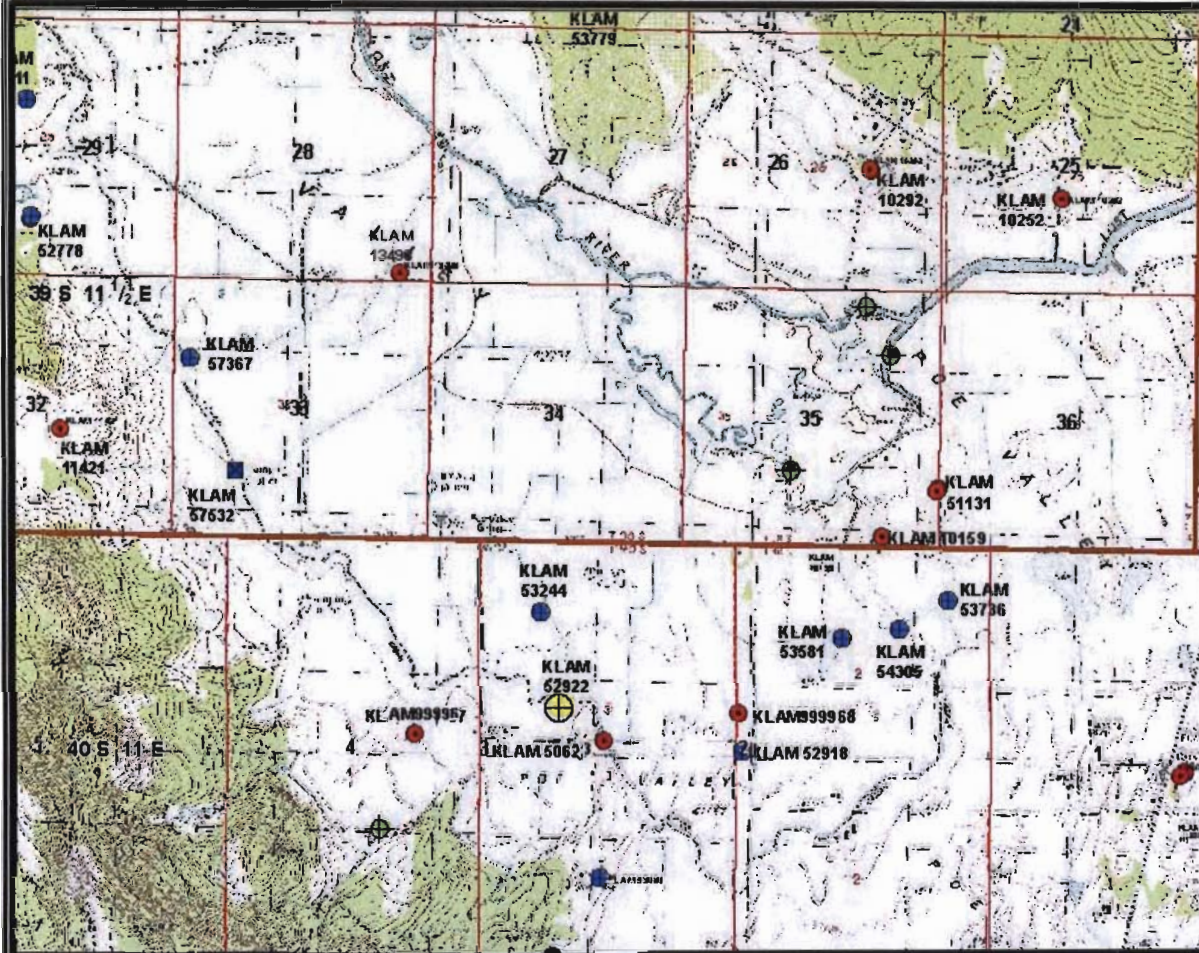
\_\_\_\_\_, 200\_\_\_\_\_  
(Enforcement Section Signature)

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

\_\_\_\_\_

# Groundwater Permit Application G-15565

## David & Marganne Oxley

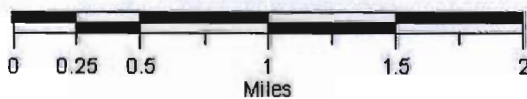
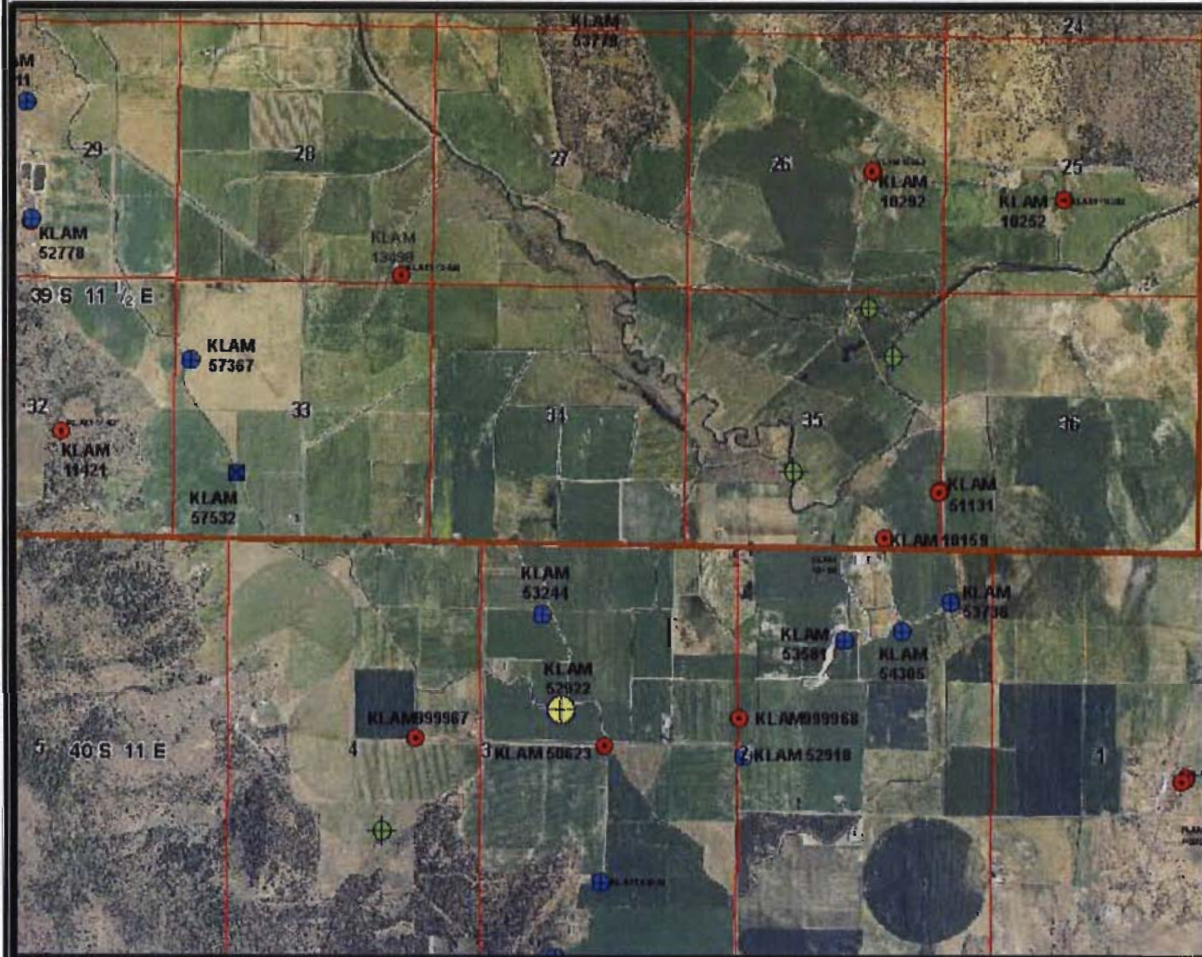


**Yellow = Proposed Well Sites**  
**Red or Blue = Other Wells**  
**Green = Surface Water Rights**



# Groundwater Permit Application G-15565

## David & Marganne Oxley



**Yellow = Proposed Well Sites**  
**Red or Blue = Other Wells**

**Green = Surface Water Rights**



KLAM 52922

STATE OF OREGON  
WATER SUPPLY WELL REPORT  
(as required by ORS 537.785)

WELL ID # L 38824  
(START CARD) # 77083

Instructions for completing this report are on the last page of this form

(1) OWNER: Well Number: \_\_\_\_\_  
Name David Oxley  
Address 24550 So. Poe Valley Rd  
City Klamath Falls State OR Zip 97803

(2) TYPE OF WORK:  
 New Well  Deepening  Alteration (repair/recondition)  Abandonment

(3) DRILL METHOD:  
 Rotary Air  Rotary Mud  Cable  Auger  
 Other

(4) PROPOSED USE:  
 Domestic  Community  Industrial  Irrigation  
 Thermal  Injection  Livestock  Other

(5) BORE HOLE CONSTRUCTION:  
Special Construction approval  Yes  No Depth of Completed Well 610 ft.  
Explosives used  Yes  No Type \_\_\_\_\_ Amount \_\_\_\_\_

| HOLE     |         | SEAL      |         | Amount          |       |
|----------|---------|-----------|---------|-----------------|-------|
| Diameter | From To | Material  | From To | sacks or pounds |       |
| 20       | 0 238   | slurry    | 238 11  | 160             | sacks |
| 14       | 238 513 | Bentonite | 11 0    | 25              | Sacks |
| 8        | 513 610 |           |         |                 |       |

How was seal placed: Method  A  B  C  D  E  
 Other Poured  
Backfill placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Material \_\_\_\_\_  
Gravel placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Size of gravel \_\_\_\_\_

(6) CASING/LINER:

| Diameter   | From | To  | Gauge | Steel                               | Plastic                  | Welded                              | Threaded                 |
|------------|------|-----|-------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|
| Casing: 16 | +1   | 238 | .250  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Liner:     |      |     |       | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |

Final location of shoe(s) \_\_\_\_\_

(7) PERFORATIONS/SCREENS:

| From | To | Slot size | Number | Diameter | Tube/pipe size | Casing                   | Liner                    |
|------|----|-----------|--------|----------|----------------|--------------------------|--------------------------|
|      |    |           |        |          |                | <input type="checkbox"/> | <input type="checkbox"/> |
|      |    |           |        |          |                | <input type="checkbox"/> | <input type="checkbox"/> |
|      |    |           |        |          |                | <input type="checkbox"/> | <input type="checkbox"/> |

(8) WELL TESTS: Minimum testing time is 1 hour  
 Pump  Bailer  Air  Flowing Artesian

| Yield gal/min | Drawdown | Drill stem at | Time  |
|---------------|----------|---------------|-------|
| 2000+         |          | 600           | 1 hr. |

Temperature of Water 84 Depth Artesian Flow found \_\_\_\_\_  
Was a water analysis done?  Yes By whom \_\_\_\_\_  
Did any strata contain water not suitable for intended use?  Too little  
 Salty  Muddy  Odor  Colored  Other  
Depth of strata: \_\_\_\_\_

(9) LOCATION OF WELL by legal description:  
County Klamath Latitude \_\_\_\_\_ Longitude \_\_\_\_\_  
Township 40S N or S. Range 11E E or W. of W.M.  
Section 3 S/E 1/4 NW 1/4  
Tax lot 11 Lot \_\_\_\_\_ Block \_\_\_\_\_ Subdivision \_\_\_\_\_  
Street Address of Well (or nearest address) 22443 Schaupp Rd.  
Klamath Falls, OR 97603

(10) STATIC WATER LEVEL:  
72 ft. below land surface. Date 8/13/2001  
Artesian pressure \_\_\_\_\_ lb. per square inch Date \_\_\_\_\_

(11) WATER BEARING ZONES:  
Depth at which water was first found 410

| From | To  | Estimated Flow Rate | SWL |
|------|-----|---------------------|-----|
| 410  | 610 |                     | 72  |

(12) WELL LOG: Ground elevation \_\_\_\_\_

| Material             | From | To  | SWL |
|----------------------|------|-----|-----|
| brn topsoil          | 0    | 1   |     |
| brn clay congl       | 1    | 16  |     |
| gray clay            | 16   | 230 | 72  |
| gray claystone       | 230  | 321 |     |
| gray sandstone       | 321  | 410 |     |
| frac gray basalt w/b | 410  | 610 |     |

RECEIVED  
SEP 13 2001  
WATER RESOURCES DEPT.  
SALEM, OREGON

Date started 7/27/2001 Completed 8/13/2001

(unbonded) Water Well Constructor Certification:  
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to my best knowledge and belief.  
Signed \_\_\_\_\_ WWC Number \_\_\_\_\_  
Date \_\_\_\_\_

(bonded) Water Well Constructor Certification:  
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.  
Signed Douglas R. Dunagan WWC Number 1575  
Date 8/24/2001

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KLAM 53630

**STATE OF OREGON**  
**WATER SUPPLY WELL REPORT**  
(as required by ORS 537.765)

WELL I.D. # L 39824  
 START CARD # 152247

Instructions for completing this report are on the last page of this form.

(1) **LAND OWNER** Well Number \_\_\_\_\_  
 Name David Oley  
 Address 28550 So Pine Valley Rd  
 City Klamath Falls State Or Zip 97603

(2) **TYPE OF WORK**  
 New Well  Deepening  Alteration (repair/recondition)  Abandonment

(3) **DRILL METHOD:**  
 Rotary Air  Rotary Mud  Cable  Auger  
 Other \_\_\_\_\_

(4) **PROPOSED USE:**  
 Domestic  Community  Industrial  Irrigation  
 Thermal  Injection  Livestock  Other \_\_\_\_\_

(5) **BORE HOLE CONSTRUCTION:**  
 Special Construction approval  Yes  No Depth of Completed Well 1175 ft  
 Explosives used  Yes  No Type \_\_\_\_\_ Amount \_\_\_\_\_

| HOLE     |           | SEAL                   |         |
|----------|-----------|------------------------|---------|
| Diameter | From To   | Material               | From To |
| 14       | 0 610     | See original well log. |         |
| 8        | 610 1025  |                        |         |
| 8        | 1025 1175 |                        |         |

How was seal placed: Method  A  B  C  D  E  
 Other \_\_\_\_\_

Buckfill placed from \_\_\_\_\_ ft to \_\_\_\_\_ ft. Material \_\_\_\_\_  
 Gravel placed from \_\_\_\_\_ ft to \_\_\_\_\_ ft. Size of gravel \_\_\_\_\_

(6) **CASING/LINER:**

| Casing/Liner | Diameter | From To | Gauge | Material                 |                          |                          |                          |
|--------------|----------|---------|-------|--------------------------|--------------------------|--------------------------|--------------------------|
|              |          |         |       | Steel                    | Plastic                  | Welded                   | Threaded                 |
| _____        | _____    | _____   | _____ | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _____        | _____    | _____   | _____ | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _____        | _____    | _____   | _____ | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Drive Shoe used  Inside  Outside  None  
 Final location of shoe(s) \_\_\_\_\_

(7) **PERFORATIONS/SCREENS:**

| From  | To    | Slot size | Number | Diameter | Tele/pipe size | Casing                   |                          | Liner                    |                          |
|-------|-------|-----------|--------|----------|----------------|--------------------------|--------------------------|--------------------------|--------------------------|
|       |       |           |        |          |                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _____ | _____ | _____     | _____  | _____    | _____          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _____ | _____ | _____     | _____  | _____    | _____          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

(8) **WELL TESTS:** Minimum testing time is 1 hour  
 Pump  Bailor  Air  Flowing  Artesian  
 Yield gal/min 3500+ Drawdown \_\_\_\_\_ Drill stem at \_\_\_\_\_ Time 1 hr

Temperature of water 84 Depth Artesian Flow Found \_\_\_\_\_  
 Was a water analysis done?  Yes By whom \_\_\_\_\_  No  
 Did any strata contain water not suitable for intended use?  Too little  
 Salty  Muddy  Odor  Colored  Other \_\_\_\_\_  
 Depth of strata: \_\_\_\_\_

(9) **LOCATION OF WELL** by legal description:  
 County Klamath Latitude \_\_\_\_\_ Longitude \_\_\_\_\_  
 Township 40S N or S Range 11E E or W. WM.  
 Section 3 SW NW 1/4  
 Tax Lot 11 Lot \_\_\_\_\_ Block \_\_\_\_\_ Subdivision \_\_\_\_\_  
 Street Address of Well (or nearest address) 22447 Schupp Rd Klamath Falls Or 97603

(10) **STATIC WATER LEVEL:**  
24 ft. below land surface. Date 12-8-02  
 Artesian pressure \_\_\_\_\_ lb per square inch Date \_\_\_\_\_

(11) **WATER BEARING ZONES:**  
 Depth at which water was first found 410

| From | To   | Estimated Flow Rate | SWL |
|------|------|---------------------|-----|
| 410  | 785  | 2000+               | 24  |
| 935  | 1175 | 1500+               | 24  |

(12) **WELL LOG:** Ground Elevation \_\_\_\_\_

| Material              | From | To   | SWL |
|-----------------------|------|------|-----|
| See original well log |      | 610  |     |
| Frac Basalt           | 610  | 785  | 24  |
| Basalt                | 785  | 935  |     |
| Frac Basalt           | 935  | 1175 | 24  |

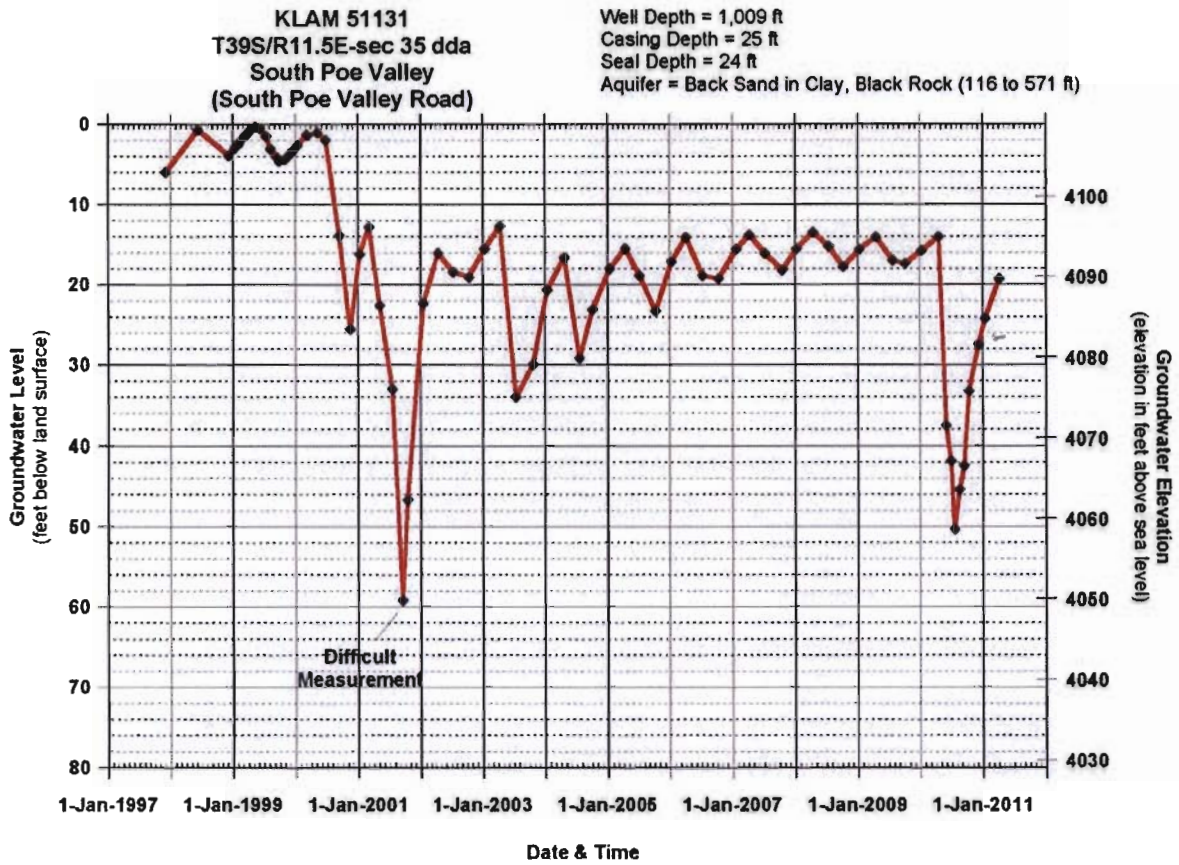
RECEIVED  
 DEC 11 2002  
 WATER RESOURCES DEPT  
 SALEM, OREGON

Date started 12-4-02 Completed 12-6-02

(unbonded) **Water Well Constructor Certification:**  
 I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.  
 Signed \_\_\_\_\_ WWC Number \_\_\_\_\_ Date \_\_\_\_\_

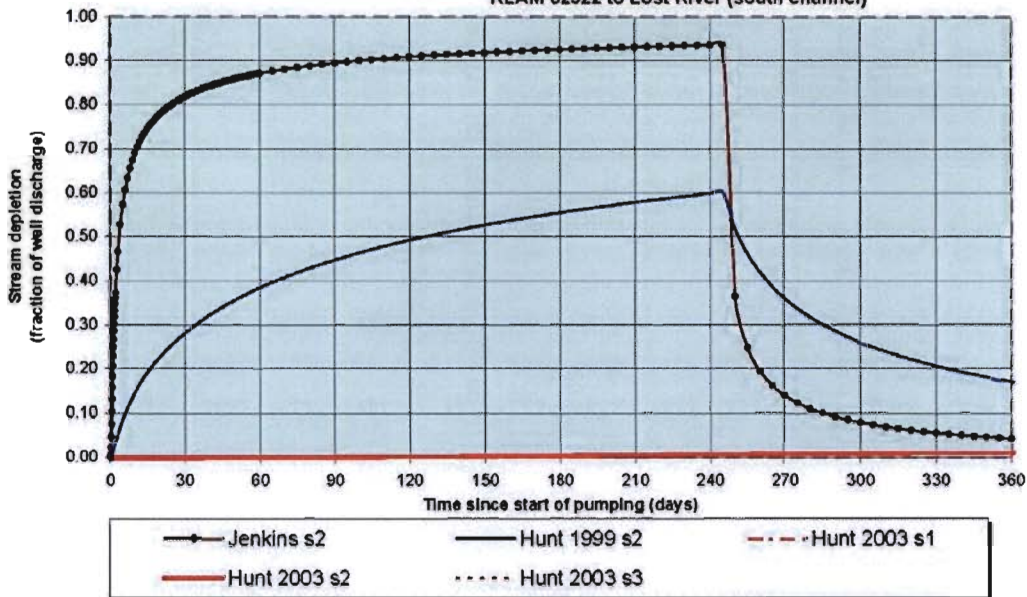
(bonded) **Water Well Constructor Certification:**  
 I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction date reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.  
 Signed David Oley WWC Number 1803 Date 12-7-02

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

KLAM 52922 to Lost River (south channel)



| Output for Stream Depletion, Scenario 2 (s2): |       |       |       |       |       |       |       |       |       |       |       | Time pump on (pumping duration) = 245 days |  |  |  |  |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|--|--|--|--|
| Days  | 30    | 60    | 90    | 120   | 150   | 180   | 210   | 240   | 270   | 300   | 330   | 360  |  |  |  |  |
| J SD  | 81.8% | 87.0% | 89.4% | 90.8% | 91.8% | 92.5% | 93.1% | 93.5% | 13.8% | 7.7%  | 5.4%  | 4.1%                                       |  |  |  |  |
| H SD 1999                                     | 28.1% | 38.3% | 44.7% | 49.2% | 52.7% | 55.4% | 57.8% | 59.7% | 35.9% | 26.0% | 20.5% | 17.0%                                      |  |  |  |  |
| H SD 2003                                     | 0.0%  | 0.1%  | 0.2%  | 0.2%  | 0.4%  | 0.5%  | 0.6%  | 0.8%  | 0.9%  | 1.0%  | 1.1%  | 1.2%                                       |  |  |  |  |
| Qw, cfs                                       | 2.040 | 2.040 | 2.040 | 2.040 | 2.040 | 2.040 | 2.040 | 2.040 | 2.040 | 2.040 | 2.040 | 2.040                                      |  |  |  |  |
| H SD 99, cfs                                  | 0.573 | 0.782 | 0.911 | 1.003 | 1.074 | 1.131 | 1.179 | 1.219 | 0.732 | 0.530 | 0.419 | 0.346                                      |  |  |  |  |
| H SD 03, cfs                                  | 0.001 | 0.002 | 0.003 | 0.005 | 0.007 | 0.010 | 0.012 | 0.015 | 0.018 | 0.020 | 0.022 | 0.024                                      |  |  |  |  |

| Parameters:                                 |          | Scenario 1 | Scenario 2 | Scenario 3 | Units                |
|---|----------|------------|------------|------------|----------------------|
| Net steady pumping rate of well             | Qw       | 2.04       | 2.04       | 2.04       | cfs                  |
| Time pump on (pumping duration)             | tpon     | 245        | 245        | 245        | days                 |
| Perpendicular from well to stream           | a        | 6350       | 6350       | 6350       | ft                   |
| Well depth                                  | d        | 1175       | 1175       | 1175       | ft                   |
| Aquifer hydraulic conductivity              | K        | 14.52      | 14.52      | 14.52      | ft/day               |
| Aquifer saturated thickness                 | b        | 500        | 500        | 500        | ft                   |
| Aquifer transmissivity                      | T        | 7260       | 7260       | 7260       | ft <sup>2</sup> /day |
| Aquifer storativity or specific yield       | S        | 0.000575   | 0.000575   | 0.000575   |                      |
| Aquitard vertical hydraulic conductivity    | Kva      | 2.09       | 2.09       | 2.09       | ft/day               |
| Aquitard saturated thickness                | ba       | 295        | 295        | 295        | ft                   |
| Aquitard thickness below stream             | babs     | 295        | 295        | 295        | ft                   |
| Aquitard porosity                           | n        | 0.2        | 0.2        | 0.2        |                      |
| Stream width                                | ws       | 50         | 50         | 50         | ft                   |
| Streambed conductance (lambda)              | sbc      | 0.354237   | 0.354237   | 0.354237   | ft/day               |
| Stream depletion factor                     | sdf      | 3.193586   | 3.193586   | 3.193586   | days                 |
| Streambed factor                            | sbf      | 0.309836   | 0.309836   | 0.309836   |                      |
| input #1 for Hunt's Q <sub>4</sub> function | l'       | 0.313128   | 0.313128   | 0.313128   |                      |
| input #2 for Hunt's Q <sub>4</sub> function | K'       | 39.349127  | 39.349127  | 39.349127  |                      |
| input #3 for Hunt's Q <sub>4</sub> function | epsilon' | 0.002875   | 0.002875   | 0.002875   |                      |
| input #4 for Hunt's Q <sub>4</sub> function | lamda'   | 0.309836   | 0.309836   | 0.309836   |                      |

G\_17323\_Oxley\_Poe\_drought\_Hunt\_2003\_depletion\_03.xls