



July 7, 2014

Mr. James Cefalo  
Idaho Department of Water Resources  
900 North Skyline Drive, Suite A  
Idaho Falls, ID 83402-1718

RECEIVED

JUL 08 2014  
Department of Water Resources  
Eastern Region

RE: AQUIFER TEST FOR EVANS WATER RIGHTS APPLICATION – 2<sup>nd</sup> LOCATION

Dear Mr. Cefalo:

I previously performed a groundwater impact assessment for Dan Evans' Water Right Application in December of 2012. Since that time he has moved his proposed point of diversion (POD) about 1.2 miles north of the POD. He also increased his proposed diversion rate to 1.8 cfs. The geology and hydrogeology between the two locations is anticipated to be very similar and use of the Jeff Davis pumping test data is still appropriate for the new location. However, the increased pumping rate is significant and the new location is more distance from streams and springs, so that it was necessary to re-run the predicted drawdown simulations.

The proposed well location is 15S, 35E, 11 SE SE as shown in Figure 1. A red circle with a radius of ½ mile is shown in the figure. It is noted that there is less development in this area as compared to the previous location south of the town of Samaria. As stated in my earlier report, it is unlikely that a deep aquifer well will interfere with streams and springs because the well will pull water from depth in the subsurface. Isolation of the deep aquifer from surface water is created by intervening layers of low permeability clay and unsaturated sediments between land surface and the intake of the well. However, because artesian springs are sensitive to drawdown and to ensure that Mr. Evans application would not impact surface water, I set a limit of less than 2 foot of head drop from pumping to any spring or stream. According to water rights on file with IDWR the nearest surface water diversions are greater than ½ mile south of the proposed POD. Table 1 lists the water rights on file with IDWR.

To estimate the long-term drawdown and impact to neighboring wells and springs from pumping of the proposed Evans Well, the forward solution capabilities of the AQTESOLV program were employed. The approach is described in my previous ground water impact assessment.

Figure 2 shows the AQTESOLV<sup>®</sup> output plot of the forward calculation for the proposed well pumping at 1.8 cfs (808 gpm) constantly for 6 months (April 15 to Oct 15). At the end of the time period the predicted drawdown is estimated to be 5.5 feet in the proposed POD. The calculated drawdown for a well ½ mile south of the POD is predicted to be 2.5 ft. Since the impact to the artesian well exceeds our target objective of 2 ft or less of decline, the flow rate was reduced to 650 gpm (1.48 cfs) and the computer model was run again. At the end of 6 months of pumping 24 hours per day / 7 seven days per week the drawdown in the proposed POD is 4.5 and the drawdown ½ mile to the south is 2.0 ft. This satisfies our target objective of creating less than 2.0 feet of drawdown.



Clearwater Geosciences, LLP  
Ground Water Development and Exploration

Due to conservatism in the assumptions used for predicting drawdown, it is unlikely that the proposed Evans' well will create as much drawdown as presented here. For instance, if the new well was to operate 80% of the time for 6 months at 808 gpm the average pumping rate would be 646 gpm. This is equivalent to same amount of drawdown as predicted in Figure 3.

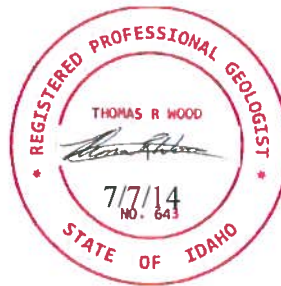
It is my professional opinion that Mr. Evan's water right application will not excessively impact his neighbors' right to divert water. I believe that the calculated drawdown over estimates the actual drawdown to be expected for the following reasons: 1) Mr. Evans will never pump continuously at the maximum rate continuously for 180 days in a single year; 2) the Paleozoic/Mesozoic rocks of the mountains are not totally impermeable as modeled and will provide some water to the system, thus reducing drawdown, 3) several canals and the Malad River are within the domain of the model and no credit for recharge or leakage to the aquifer is taken in the model, and 4) the calculated water levels used a confined aquifer solution for the entire model domain, which covers many square miles. It is known that unconfined conditions exist in parts of the area that would reduce predicted drawdown. All of these factors are likely to over-predicted drawdown presented here.

Please do not hesitate to call me if you have any questions about this letter or the calculations presented.

Respectfully,

A handwritten signature in black ink, appearing to read "Thomas R. Wood".

Thomas R. Wood, PhD, PG



cc

Mr. Daniel Evans, 5071 South 4600 West, Malad, ID 83252

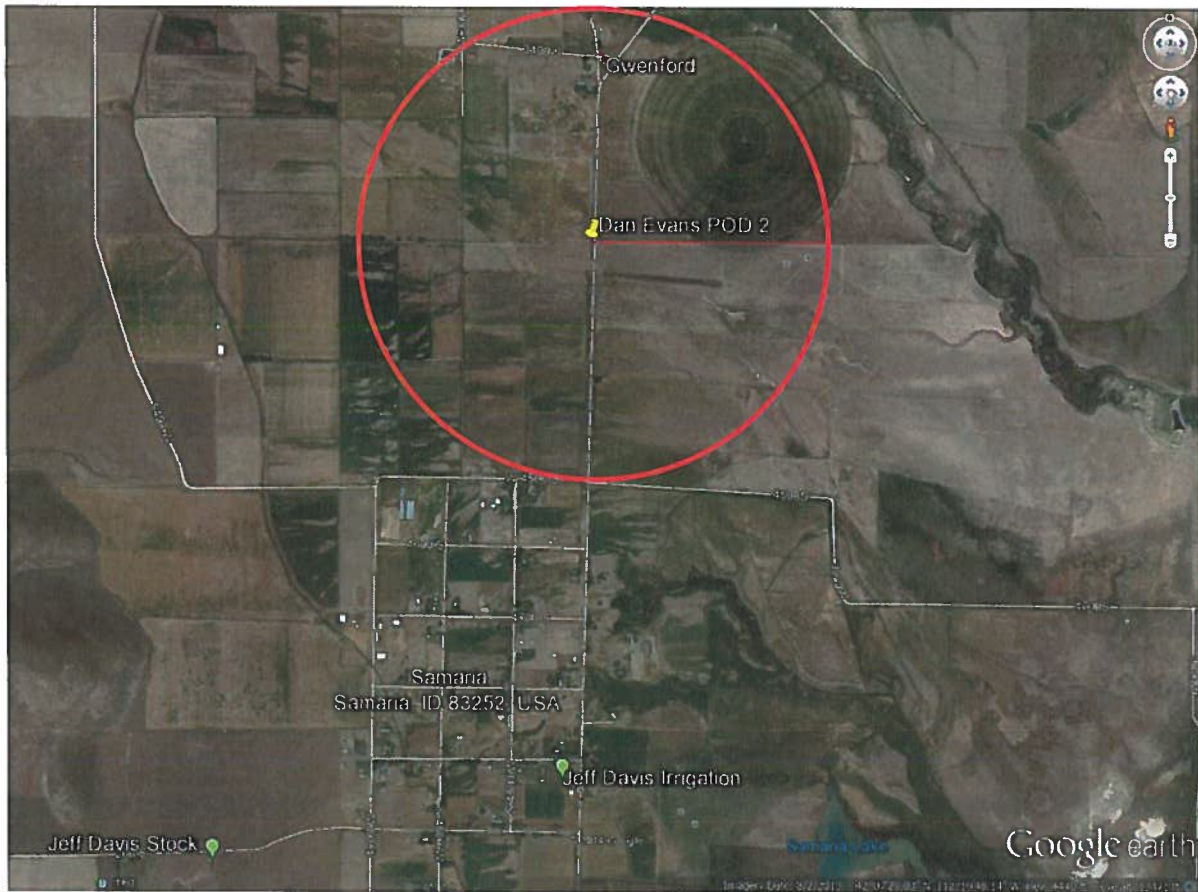
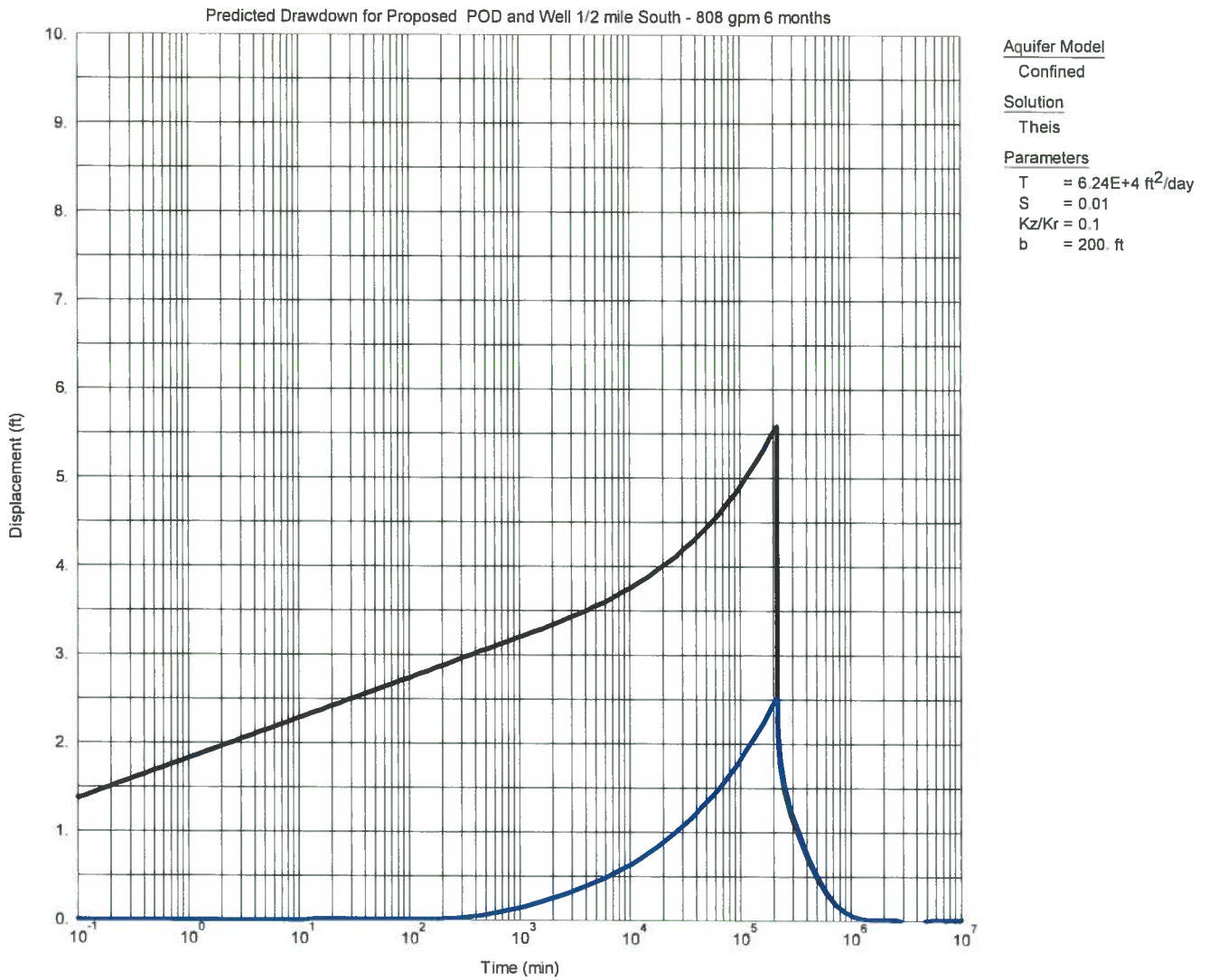


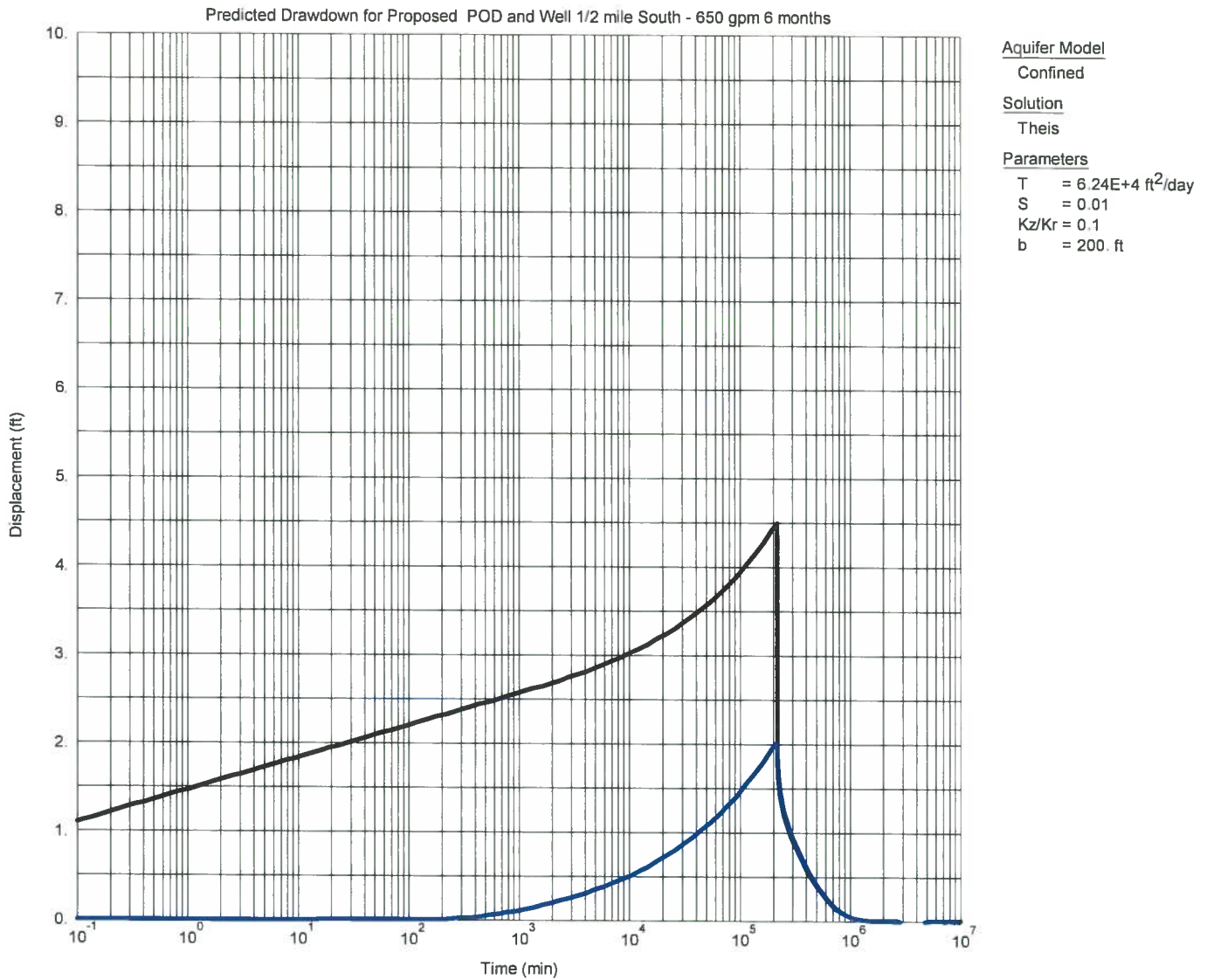
Figure 1. Map showing locations of the Proposed Dan Evans well, the Davis Irrigation Well and the Davis Stock Well. Red circle has radius of 1/2 mile.



**Key to line colors**

- Blue Imaginary well 1/2 mile south of the proposed POD
- Black Proposed POD for Evans

Figure 2 Predictive drawdown plot of pumping at 808 gpm or 1.8 cfs continuously for 6 months.



**Key to line colors**

- Blue Imaginary well 1/2 mile south of the proposed POD
- Black Proposed POD for Evans

Figure 3 Predictive drawdown plot of pumping at 650 gpm or 1.48 cfs continuously for 6 months.



**Clearwater Geosciences, LLP**  
**Ground Water Development and Exploration**

Table 1 List of water rights with POD's in Sections 11, 12, 13 and 14.

POD T155 R35E Section 11												
Options	Water Right	Acres	Priority	Class	Status	Issue Date	Flow	Point of Diversion	Beneficial Use	Priority	Water Right	Owner
<a href="#">Details</a>	Water Right	15	2021		License	Active	3/12/1937	0.48	GROUND WATER	DOMESTIC, IRRIGATION		WRIGHT, LYNN A, WRIGHT, SHAUNA
<a href="#">More Options</a>												
<a href="#">Details</a>	Water Right	15	2072		License	Active	5/10/1967	2.4	GROUND WATER	IRRIGATION		WALDRON, L R, WALDRON, REX P
<a href="#">More Options</a>												
<a href="#">Details</a>	Water Right	15	4000		Statutory Claim	Active	6/1/1938	0.03	GROUND WATER	DOMESTIC, STOCKWATER		PRICE, EVAN P, PRICE, MRS EVAN PLATT
<a href="#">More Options</a>												
<a href="#">Details</a>	Water Right	15	4185		Statutory Claim	Active	1/1/1930	0.5	GROUND WATER	IRRIGATION, STOCKWATER		WRIGHT, LYNN A, WRIGHT, SHAUNA
<a href="#">More Options</a>												
<a href="#">Details</a>	Water Permit	15	7288			Active	6/20/2007	0.66	GROUND WATER	IRRIGATION, STOCKWATER		WRIGHT, LYNN A
<a href="#">More Options</a>												
<a href="#">Details</a>	Water Application	15	7365	78378		Active	1/24/2014	1.8	GROUND WATER	IRRIGATION, STOCKWATER		EVANS, DANIEL
<a href="#">More Options</a>												
POD T155 R35E Section 12												
Options	Water Right	Acres	Priority	Class	Status	Issue Date	Flow	Point of Diversion	Beneficial Use	Priority	Water Right	Owner
<a href="#">Details</a>	Water Right	15	2059		License	Active	7/17/1961	3.95	GROUND WATER	IRRIGATION		JOHN E BLAISDELL & SONS, WILLIAMS, ELVA P, WILLIAMS, JAMES B
<a href="#">More Options</a>												
<a href="#">Details</a>	Water Permit	15	7244			Active	4/21/2003	1	GROUND WATER	IRRIGATION		JOHNSON, SHERRIE, JOHNSON, STEPHEN C
<a href="#">More Options</a>												
POD T155 R35E Section 13												
Options	Water Right	Acres	Priority	Class	Status	Issue Date	Flow	Point of Diversion	Beneficial Use	Priority	Water Right	Owner
<a href="#">Details</a>	Water Permit	15	7320			Active	3/3/2009	2	GROUND WATER	IRRIGATION		FLINDERS SAMARIA RANCH LC
<a href="#">More Options</a>												
POD T155 R35E Section 14												
Options	Water Right	Acres	Priority	Class	Status	Issue Date	Flow	Point of Diversion	Beneficial Use	Priority	Water Right	Owner
<a href="#">Details</a>	Water Right	15	2005		License	Active	3/16/1911	0.2	UNNAMED STREAM	DOMESTIC, IRRIGATION		WILLIAMS, DANIEL M
<a href="#">More Options</a>												
<a href="#">Details</a>	Water Right	15	4031		Statutory Claim	Active	5/12/1920	0.04	GROUND WATER	DOMESTIC, IRRIGATION, STOCKWATER		JOHN, DEVERL
<a href="#">More Options</a>												
<a href="#">Details</a>	Water Right	15	4138		Statutory Claim	Active	4/1/1900	2.05	SPRINGS	IRRIGATION		FLINDERS SAMARIA RANCH LC
<a href="#">More Options</a>												
<a href="#">Details</a>	Water Right	15	4139		Statutory Claim	Active	4/1/1900	2	THORPE SPRINGS	IRRIGATION		THORPE, S GRANT, THORPE, WILLIAM D
<a href="#">More Options</a>												
<a href="#">Details</a>	Water Right	15	4187		Statutory Claim	Active	5/19/1959	1	SPRING	IRRIGATION		WARD, J MORONI
<a href="#">More Options</a>												
<a href="#">Details</a>	Water Right	15	7094		License	Active	6/7/1983	0.06	GROUND WATER	DOMESTIC, IRRIGATION		WALDRON, REX P
<a href="#">More Options</a>												
<a href="#">Details</a>	Water Right	15	7154		License	Active	8/12/1996	1.19	GROUND WATER	IRRIGATION		ATKINSON, DELON
<a href="#">More Options</a>												
<a href="#">Details</a>	Water Right	15	7175		License	Active	8/30/1999	0.31	GROUND WATER	IRRIGATION, STOCKWATER		M J DAVIS MEMORIAL LTD PARTNERSHIP
<a href="#">More Options</a>												
<a href="#">Details</a>	Water Right	15	7267		License	Active	6/4/2008	1.8	GROUND WATER	IRRIGATION		GLEED, JULIA
<a href="#">More Options</a>												
<a href="#">Details</a>	Water Permit	15	7243			Active	2/26/2004	1.3	GROUND WATER	IRRIGATION		JOHN, ELDON, JOHN, MIKE
<a href="#">More Options</a>												