

MEMO

To: 96-9059 Adams

From: Sandy Hemenway

Ref: Licensing Review Memo

February 2, 2011

The Permit to Appropriate was approved on 5/28/2003 for recreational storage 1/1-12/31 (0.6 af), and diversion to storage 1/1-12/31 (0.10 cfs). The Proof of Beneficial Use was due on or by 6/1/2004, and was received on 5/19/2004.

The **field exam was conducted on 5/10/2005** by Wayne Baldwin. At Turnipseed Creek, a 4-inch PVC pipe running along the right-of-way approximately 160 ft to the inlet of the 40 ft X 108 ft X 8 ft deep X 0.6 slope pond, with a flow through system that flows back to the Turnipseed Creek. There were **no POD or POU Overlaps**.

A **letter received on 5/17/2002** from Bonner County Public Works, stated that Guy Meserve, Foreman, granted permission for Steve Adams to trench within the right-of-way with a 4 inch pipe to serve as a gravity line to a pond. This permit is for the 4-inch pipe only, and there are to be no water diversion devices installed within the right-of-way now or in the future.

To construct the **POU and POD shapefiles**, it required use of 2 maps in the file received on 5/6/2002, and 2009 ArcMap.

CFS

(1) A physical measure (5-gallon bucket measurement) was collected during the 5/10/2005 field exam, at the inlet of the pond. 5 gallons in 6.6 seconds.
 $(5 \text{ gal.} \times 60 \text{ sec}) / 6.6 \text{ sec} = 45.45 \text{ gpm}$. $45.45 \text{ gpm} \times 0.00223 = 0.10 \text{ cfs}$.

(2) Pipe capacity for a 4 inch pipe = 0.44 cfs capacity of pipe if it were full.

RECOMMEND: 0.10 cfs as permitted, and measured.

Volume

Recreation Storage:

(1) From the 5/10/2005 field exam, $(40 \text{ ft} \times 108 \text{ ft} \times 8 \text{ ft deep} \times 0.6 \text{ slope}) / 43560 = 0.47 = 0.5 \text{ af}$

(2) Arc Map calculated the pond size at 0.1 acre = 4356. $(4356 \times 8 \text{ ft deep} \times 0.6 \text{ slope}) / 43560 = 0.48 = 0.5 \text{ af}$

(3) ER Idaho 2009 Evapotranspiration and consumptive Irrigation Water Requirements for Idaho: $ET = 0.2 \text{ af}$, therefore allow the permit amount of 0.6 af.

RECOMMEND: 0.6 af

$$\Delta s = Q_{in} + P + ET - S$$

If there is no flowthrough, then $\Delta s = Q_{in} + P + ET$

Δs = Change in Storage

Q_{in} = Flow going into pond

$$Q_{in} = (\text{diversion rate}) * (\# \text{ day's in Season}) * (\text{convert to seconds}) / (\text{convert to AF})$$

$$Q_{in} = 0.10 * 365 * 86400 / 43560 = 72.4 \text{ AFA}$$

P = precipitation

Found at: <http://www.kimberly.uidaho.edu/ETIdaho/>

$$P = \text{convert to AFA: } \frac{\text{mm/yr}}{\text{convert to feet}} * \# \text{ acres}$$

$$P = 0.3 \text{ AFA} * \frac{857}{304.8} = 0.1$$

ET = find at: <http://www.kimberly.uidaho.edu/ETIdaho/>

$$ET = \text{convert to AFA} * \frac{\text{mm/yr}}{\text{convert to feet}} * \# \text{ acres}$$

$$ET = 0.2 \text{ AFA} * \frac{759}{304.8} = 0.1$$

$$S = 72.4 \text{ AFA}$$

ET_{Idaho} 2009: Evapotranspiration and Consumptive Irrigation Water Requirements for Idaho

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Sandpoint KSPT (NWS --108137)

Statistics based on thirty

For a different land cover or crop click on the above link.

You can highlight this table and copy via the clipboard to a Microsoft Excel or OpenOffice spreadsheet to plot or otherwise work with this data.

Open water - shallow systems (ponds, streams)															
Actual Evapotranspiration (Click here for a graph)															
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Growing Season ^a	Non Growing Season ^b	Annual
Mean	mm/day												mm		
Monthly ^c	0.21	0.59	1.32	2.40	3.18	3.74	4.33	4.01	2.87	1.55	0.46	0.15	759	0	759
15-Day Moving Average ^d	0.21	0.58	1.31	2.38	3.21	3.73	4.37	4.03	2.83	1.55	0.45	0.15			
7-Day Moving Average ^e	0.21	0.58	1.31	2.38	3.20	3.73	4.36	4.03	2.85	1.55	0.45	0.15			
3-Day Moving Average ^f	0.21	0.59	1.32	2.39	3.18	3.73	4.34	4.02	2.86	1.55	0.46	0.15			
Standard Deviation	mm/day												mm		
Monthly	0.06	0.11	0.30	0.29	0.49	0.38	0.68	0.59	0.38	0.34	0.10	0.07	37	0	37
15-Day Moving Average	0.08	0.15	0.28	0.37	0.49	0.54	0.55	0.56	0.50	0.35	0.13	0.06			
7-Day Moving Average	0.11	0.21	0.36	0.56	0.67	0.74	0.68	0.70	0.64	0.46	0.17	0.09			
3-Day Moving Average	0.15	0.27	0.46	0.72	0.87	0.96	0.85	0.85	0.79	0.54	0.21	0.12			
20% Exceedance	mm/day												mm		
Monthly	0.24	0.67	1.45	2.53	3.53	4.04	4.56	4.31	3.19	1.74	0.52	0.19	789	0	789
15-Day Moving Average	0.36	0.83	1.73	2.94	4.03	4.55	5.05	4.83	3.71	2.15	0.69	0.25			
7-Day Moving Average	0.47	1.09	2.16	3.38	4.76	4.98	5.42	5.21	4.14	2.40	0.82	0.34			
3-Day Moving Average	0.63	1.23	2.67	3.87	5.11	5.63	5.70	5.50	4.40	2.64	0.98	0.50			

80% Exceedance	mm/day												mm		
Monthly	0.16	0.47	1.17	2.17	2.83	3.38	4.04	3.49	2.41	1.30	0.37	0.11	719	0	719
15-Day Moving Average	0.09	0.38	0.91	1.77	2.48	2.83	3.62	2.88	2.04	1.06	0.25	0.06			
7-Day Moving Average	0.02	0.26	0.77	1.39	2.07	2.44	3.08	2.50	1.66	0.79	0.20	0.01			
3-Day Moving Average	0.05	0.14	0.57	1.17	1.57	1.83	2.39	1.85	1.24	0.63	0.10	0.07			
Ave Highest ET_{act}	mm/day												--		
15-Day Moving Average ^g	0.29	0.71	1.57	2.76	3.61	4.20	4.74	4.43	3.26	1.89	0.58	0.21			
7-Day Moving Average ^h	0.38	0.89	1.86	3.18	4.14	4.70	5.05	4.81	3.66	2.16	0.69	0.28			
3-Day Moving Average ⁱ	0.53	1.06	2.23	3.68	4.67	5.24	5.44	5.21	4.02	2.41	0.86	0.40			
Ave Lowest ET_{act}	mm/day												--		
15-Day Moving Average ^g	0.13	0.47	1.09	2.00	2.83	3.26	3.99	3.57	2.44	1.22	0.34	0.10			
7-Day Moving Average ^h	0.06	0.35	0.90	1.64	2.37	2.75	3.56	3.15	2.12	1.00	0.26	0.04			
3-Day Moving Average ⁱ	0.01	0.23	0.71	1.32	1.84	2.11	2.94	2.57	1.68	0.79	0.18	0.04			
Special normal distribution parameters for monthly, seasonal, and annual intervals													--		
Skew	0.07	0.18	0.30	1.09	0.01	0.75	0.10	-0.12	0.36	0.13	0.18	0.12	0.28	0.00	0.28
Kurtosis	0.60	2.66	0.96	4.27	0.57	3.21	1.43	0.65	2.55	0.70	2.72	0.81	2.83	0.00	2.83

^a Growing Season: This is usually the time from green up or planting in the spring to a killing frost or harvest in the fall. It is not applicable for entries without a growing season and will be blank.

^b Nongrowing Season: This is usually the time from a killing frost or harvest in the fall to the of green up in the spring. It is not applicable for entries without a growing season.

^c Mean of the average daily value for month

^d Mean of the fourteen 15-day period averages contained in the month

^e Mean of the twenty three 7-day period averages contained in the month

^f Mean of the twenty seven 3-day period averages contained in the month

^g Mean of the highest/lowest 15-day period average in month

^h Mean of the highest/lowest 7-day period average in month

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You can highlight this table and copy via the clipboard to a Microsoft Excel or OpenOffice spreadsheet to plot or otherwise work with this data.

Gross Precipitation															
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Growing Season ^a	Non Growing Season ^b	Annual
Mean	mm/day												mm		
Monthly ^c	3.37	2.80	2.27	1.90	2.42	2.08	1.07	1.17	1.26	2.10	4.06	3.65	0	857	857
15-Day Moving Average ^d	3.27	3.10	2.32	1.91	2.36	2.18	1.17	1.23	1.40	2.00	3.99	3.52			
7-Day Moving Average ^e	3.33	2.94	2.32	1.94	2.38	2.16	1.11	1.20	1.31	2.01	4.07	3.52			
3-Day Moving Average ^f	3.35	2.82	2.27	1.94	2.41	2.12	1.08	1.17	1.28	2.08	4.05	3.62			
Standard Deviation	mm/day												mm		
Monthly	2.33	1.82	1.62	0.85	1.57	0.97	1.59	1.61	0.88	1.79	1.72	2.27	0	146	146
15-Day Moving Average	2.28	2.47	1.67	1.30	1.80	1.52	1.62	1.54	1.33	1.67	2.19	2.18			
7-Day Moving Average	3.21	3.36	2.20	2.03	2.49	2.20	1.90	2.08	1.78	2.26	3.38	3.31			
3-Day Moving Average	4.43	4.33	3.10	2.91	3.50	3.11	2.49	2.77	2.44	3.15	5.01	4.84			
20% Exceedance	mm/day												mm		
Monthly	4.29	3.46	3.02	2.48	3.12	2.53	1.65	2.21	1.97	3.42	5.18	5.10	0	989	989
15-Day Moving Average	6.42	5.62	5.17	3.92	5.07	4.41	2.63	4.19	3.32	5.05	7.27	7.44			
7-Day Moving Average	9.93	8.97	6.87	6.53	7.56	6.57	4.61	7.09	4.90	8.07	10.40	13.47			
3-Day Moving Average	17.53	11.63	11.50	12.00	12.60	13.10	8.23	11.00	10.17	11.70	18.90	18.10			
80% Exceedance	mm/day												mm		
Monthly	2.50	1.22	1.30	1.12	1.58	1.25	0.31	0.15	0.31	1.01	2.42	2.18	0	733	733

15-Day Moving Average	0.25	0.35	0.37	0.22	0.33	0.11	0.00	0.00	0.00	0.09	0.81	0.46	
7-Day Moving Average	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3-Day Moving Average	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Ave Highest	mm/day												--
15-Day Moving Average ^g	5.17	4.23	3.63	2.96	3.86	3.33	1.85	2.03	2.19	3.36	5.89	5.56	
7-Day Moving Average ^h	8.06	7.08	5.59	4.95	6.11	5.33	3.02	3.60	3.54	5.50	8.98	8.87	
3-Day Moving Average ⁱ	13.33	11.63	9.53	8.69	10.47	9.23	5.70	6.59	6.66	9.03	15.16	14.72	
Ave Lowest	mm/day												--
15-Day Moving Average ^g	1.30	1.84	1.16	0.77	0.98	1.02	0.38	0.43	0.48	0.81	2.21	1.52	
7-Day Moving Average ^h	0.37	0.13	0.22	0.12	0.24	0.14	0.05	0.01	0.03	0.14	0.56	0.32	
3-Day Moving Average ⁱ	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	
Special normal distribution parameters for monthly, seasonal, and annual intervals													--
Skew	0.32	1.37	0.26	0.53	0.39	1.41	0.93	0.38	0.17	0.12	0.95	0.12	0.00 0.57 0.57
Kurtosis	1.34	4.57	0.84	3.18	1.14	5.57	2.79	0.74	2.10	0.52	5.11	0.71	0.00 3.00 3.00

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ⁱ Mean of the highest/lowest 3-day period average in month

This work and report were prepared by the University of Idaho Research and Extension Center at Kimberly, Idaho under contract with the Idaho Department of Water Resources. Work was supported by funding from IDWR and the Idaho Agricultural Experiment Station and Idaho Engineering Experiment Station. The authors gratefully acknowledge the long-term evapotranspiration data collection and long-

Check Administrative Area Results

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Season Of Use 4/1 - 10/31

Season Of Use 4/15 - 10/31

Headgate Requirement 3

Consumptive Use 2

msf_upstream

Municipal Service Area ODEN WATER ASSN

Municipal Service Area KOOTENAI HEIGHTS WATER SYSTEM

Source Water Plumes DOVER CITY OF

Source Water Plumes SUNNYSIDE WATER ASSN

Source Water Plumes SANDPOINT WATER DEPT

Source Water Plumes RED FIR RESORT

No Details Available For This Record

NWNE

NENE

SWNE

SENE

Turnip seed Creek

POU

POD

NWSE

NESE

