

[illegible]

PLACE OF USE: STOCKWATER STORAGE

Twp	Rge	Sec	NE				NW				SW				SE				Totals
07S	13E	23	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	
									X										

PLACE OF USE: RECREATION STORAGE

Twp	Rge	Sec	NE				NW				SW				SE				Totals
07S	13E	23	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	
									X										

DIVERSION TO STORAGE same as **RECREATION STORAGE**

Method of Determination: ArcMap and Aerial Photo

3. ☒ Delivery System Diagram Attached (required). Indicate all major components and distances between components. Indicate weir size/pipe as applicable.
- ☒ Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.
- ☒ Aerial Photo Attached (required for irrigation of 10+ acres).
- ☐ Photo of Diversion and System Attached

4.

<u>Well or Diversion ID No.*</u>	<u>Motor Make</u>	<u>Hp</u>	<u>Motor Serial No.</u>	<u>Pump Make</u>	<u>Pump Serial No. or Discharge Size</u>
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*Code to correspond with No. on map and aerial photo

D. FLOW MEASUREMENTS

1.

<u>Measurement Equipment</u>	<u>Type</u>	<u>Make</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Size</u>	<u>Calib. Date</u>
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2. Measurements:

With Mr. Steel's assistance, I used a surveyor's rod and transit to determine the slope of the incoming water pipe. I measured the pipe diameter and determined the type of pipe material involved. These parameters were inserted into an online Manning Pipe Flow Calculator, resulting in a flow of 0.21 cfs.

Using the measuring tool in ArcMap, the length of the Big Bend Ditch from Tucker Springs to the place of use was determined to be 3.5 miles. The conveyance loss, at a rate of 10 percent per mile, would be 0.12 cfs.

E. FLOW CALCULATIONS☒ Additional Computation Sheets Attached

Measured Method: Flow calculated using the online Manning Pipe Flow Calculator was 0.21 cfs. Adding the conveyance loss of 0.12 cfs, a diversion rate of 0.33 cfs would be appropriate.

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation: NA

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) =$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 =$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} =$$

2. Volume Calculations for Other Uses:

The area of the pond surface, measured in ArcMap, was 0.5 acre. Seven pond depth measurements were taken around the pond, averaging 1.39 feet in depth. 0.5 acre x 1.39 feet = 0.70 AF. The pond volume will be limited to 0.2 AF by permit.

G. NARRATIVE/REMARKS/COMMENTS

The field visit for this permit was made on 1-16-2013, accompanied by Chuck Steele, property caretaker. Water flows out of the Big Bend Ditch through an 8 inch pipeline, which is controlled by a screwlift headgate. Water flows approximately 150 feet through the pipeline to the east side of the pond.

Flow out of the pond is through another 8 inch pipeline and out of a screwlift headgate. No check system exists in the ditch to back up the water, so the water level in the pond stays about the same as the ditch, due to the flat grade of the ditch.

No method of measuring the flow has been installed on either the incoming or the outgoing structures.

Water depth measurements were made in seven places around the pond, with an average depth of 1.39 feet. The surface area of the pond, from measurements made on ArcMap, is 0.5 acre. This gives a pond volume of 0.70 AF, considerably more than the 0.2 AF permitted. A new permit will be sought to account for the extra volume and evaporative loss.

Mr. Steele stated that about one foot of clay was compacted on the bottom of the pond to seal it prior to filling. He also said that he runs about 35 head of cattle in the field around the pond in March and April. This, too, is more than the permit allows, but there are other stockwater rights on the same place of use.

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS**1. Recommended Amounts**

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
RECREATION	10/16 to 01/31	0.330 CFS	
DIVERSION TO STORAGE	10/16 to 01/31	0.330 CFS	
STOCKWATER STORAGE	01/01 to 12/31		0.20 AF
RECREATION STORAGE	01/01 to 12/31		0.20 AF
<u>Totals:</u>		0.330 CFS	0.20 AF

2. Recommended Amendments

☐ Change P.D. as reflected above ☐ Add P.D. as reflected above ☒ None

☐ Change P.U. as reflected above ☐ Add P.U. as reflected above ☐ Other

I. AUTHENTICATION

Field Examiner's Name  Date 1-16-2013

Reviewer  Date 2/11/13

Idaho Department of Water Resources



Stone
36-16740
System Diagram

Legend

- Township/Range
- Sections
- QQ



Date: 1/24/2013

36-16740

[List of Calculators](#)[Hydraulics](#)[Language](#)

Manning Formula Uniform Pipe Flow at Given Slope and Depth

[Can you help me translate this calculator to your language or host this calculator at your web site?](#)

		Results:	
Pipe diameter, d_0	8 inches	Flow, q	0.2078 cfs
Manning roughness, n ?	0.01	Velocity, v	0.5953 ft/sec
Pressure slope (possibly ? equal to pipe slope), S_0	.000175 rise/run	Velocity head, h_v	0.0055 ft
Percent of (or ratio to) full depth (100% or 1 if flowing full)	100 %	Flow area	0.3491 ft ²
		Wetted perimeter	0.6384 m
		Hydraulic radius	0.0508 m
		Top width, T	0.0000 ft
		Froude number, F	0.00
		Shear stress (tractive force), τ	0.3487 N/m ²

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Last Modified 01/18/2013 14:42:23



Views of Incoming Headgate on Big Bend Ditch





Views of Outgoing Headgate on Big Bend Ditch





View of Pond Looking West

View of Pond Looking East





View of Pond Looking North

View of Mostly Iced-over pond



36-16740



Submerged PVC Delivery Pipe in Pond

ET_{Idaho} 2012 -- Evapotranspiration and Consumptive Irrigation Water Requirements for Idaho

Please send suggestions for improving this site to robison at kimberly dot uidaho dot edu Copyright 2012, University of Idaho.

Hagerman 2 SW (NWS -- 103932)

Statistics based on thirty year normal spans 1983 to 2010 years

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)														
Precipitation Deficit (Click here for a graph)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Growing Season ^a	Non Growing Season ^b
Mean ^j	mm/day												mm	
Monthly ^c	0.17	0.27	1.54	2.74	3.71	4.74	5.42	4.75	3.93	2.29	0.21	-0.94	871	0
15-Day Moving Average ^d	0.15	0.10	1.59	2.80	3.77	4.79	5.47	4.72	3.87	2.38	0.19	-0.77		
7-Day Moving Average ^e	0.16	0.14	1.54	2.77	3.76	4.75	5.44	4.73	3.91	2.36	0.22	-0.87		
3-Day Moving Average ^f	0.16	0.22	1.54	2.76	3.73	4.74	5.42	4.75	3.93	2.29	0.24	-0.94		
Standard Deviation ^k	mm/day												mm	
Monthly ^c	0.83	0.86	1.39	0.69	1.37	0.81	0.69	0.78	0.46	1.17	0.94	1.72	125	0
15-Day Moving Average ^d	0.72	1.17	1.23	0.91	1.40	0.96	0.58	0.74	0.58	1.00	1.29	1.28		
7-Day Moving Average ^e	0.95	1.42	1.49	1.44	1.79	1.44	0.74	0.97	0.78	1.45	1.62	1.85		
3-Day Moving Average ^f	1.36	1.80	2.01	2.04	2.35	1.85	1.02	1.33	1.05	2.05	2.11	2.69		
20% Exceedance ^l	mm/day												mm	
Monthly ^c	0.22	0.93	2.30	3.32	4.33	5.35	5.67	5.08	4.19	2.87	1.08	0.08	943	0
15-Day Moving Average ^d	0.59	1.08	3.17	3.85	5.45	6.06	5.96	5.46	4.64	3.49	1.71	0.70		
7-Day Moving Average ^e	1.07	1.71	3.50	4.95	6.25	6.35	6.48	5.92	5.11	4.16	2.17	1.10		
3-Day Moving Average ^f	1.28	2.21	4.14	5.89	6.78	6.90	6.78	6.31	5.57	4.60	2.62	1.48		

80% Exceedance ^m	mm/day												mm		
Monthly ^c	0.63	0.46	0.13	1.89	3.09	3.92	4.85	4.45	3.60	1.20	0.75	-2.20	753	0	753
15-Day Moving Average ^d	1.52	1.69	-0.56	1.36	1.20	2.78	4.23	3.79	2.82	0.11	2.26	-2.98			
7-Day Moving Average ^e	2.55	3.34	-2.71	1.74	-1.47	1.22	3.94	3.02	2.07	2.56	4.45	-6.19			
3-Day Moving Average ^f	5.68	4.49	-6.11	5.01	-4.92	0.18	2.60	0.63	0.42	8.06	7.49	14.27			
Ave Highest P _{def}	mm/day												--		
15-Day Moving Average ^g	0.49	0.83	2.34	3.62	4.83	5.60	5.75	5.20	4.38	3.20	1.15	0.37			
7-Day Moving Average ^h	0.87	1.40	2.85	4.52	5.70	6.10	6.11	5.61	4.85	3.65	1.70	0.77			
3-Day Moving Average ⁱ	1.14	1.86	3.59	5.34	6.38	6.65	6.58	6.01	5.26	4.19	2.22	1.03			
Ave Lowest P _{def}	mm/day												--		
15-Day Moving Average ^g	0.70	0.36	0.79	2.00	2.65	3.91	5.10	4.24	3.40	1.51	0.69	-1.78			
7-Day Moving Average ^h	1.43	1.33	-0.40	0.51	1.26	2.78	4.62	3.67	2.80	0.33	1.93	-3.38			
3-Day Moving Average ⁱ	3.01	2.90	-2.61	1.74	-1.01	1.34	3.49	2.30	1.73	2.13	4.50	-6.38			
Special normal distribution parameters for monthly, seasonal, and annual intervals															
Skew ^m	0.06	1.23	-0.08	0.21	-0.25	1.61	0.37	-0.57	1.24	0.11	0.49	-0.05	0.02	0.00	0.02
Kurtosis ^o	0.97	4.16	0.69	2.54	0.98	5.16	1.07	1.79	6.23	0.65	2.62	0.67	2.91	0.00	2.91

^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

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

^j This value represents the *mean value* for the parameter for the month over the 'normal' period of record. Generally, the 'normal' period is the last thirty years with data.

^k This value represents the *standard deviation* for the parameter for the month over the 'normal' period.

^l This value represents the *value* for the parameter that has a 20% chance of being exceeded that month during any particular year. Conversely, there is an 80% chance that the parameter value will be less than the *value* shown.

^m This value represents the *value* for the parameter that has a 80% chance of being exceeded that month during any particular year. Conversely, there is an 20% chance that the parameter value will be less than the *value* shown.

ⁿ This value represents the *skewness (asymmetry) of the distribution of the parameter values* for the month (year) over the 'normal' period. A value near zero indicates that the distribution approximates a normal (Gaussian) and symmetrical distribution. A negative skew indicates that the parameter distribution has relatively few low values compared to high values. A positive skew indicates that the distribution has relatively few high values compared to the number of low values. A skew value near 1 indicates that the underlying distribution approximates a lognormal distribution.

^o This value represents the *kurtosis* of the parameter value distribution for the month (year) over the 'normal' period. Kurtosis is a measurement of the height to width ratio of the probability distribution, or the *peakedness (slenderness)*. A normal (Gaussian) distribution has a kurtosis of 3. A high kurtosis distribution has a sharper peak and longer tails, while a low kurtosis distribution has a more rounded peak and shorter tails.

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-standing advice provided by Dr. James L. Wright, USDA-ARS Kimberly (ret.), the more than two decades of high quality agricultural weather data collection by the U.S. Bureau of Reclamation AgriMet system, and the very long-standing, routine data collection by the hundreds of cooperative weather station volunteers across the state who, for more than one-hundred years, have faithfully observed daily air temperature and precipitation.

The citation for the evapotranspiration data used from this site should be: *Allen, Richard G. and Clarence W. Robison, 2012. Evapotranspiration and Consumptive Irrigation Water Requirements for Idaho: Supplement updating the Time Series through December 2008, Research Technical Completion Report, Kimberly Research and Extension Center, University of Idaho, Moscow, ID.*

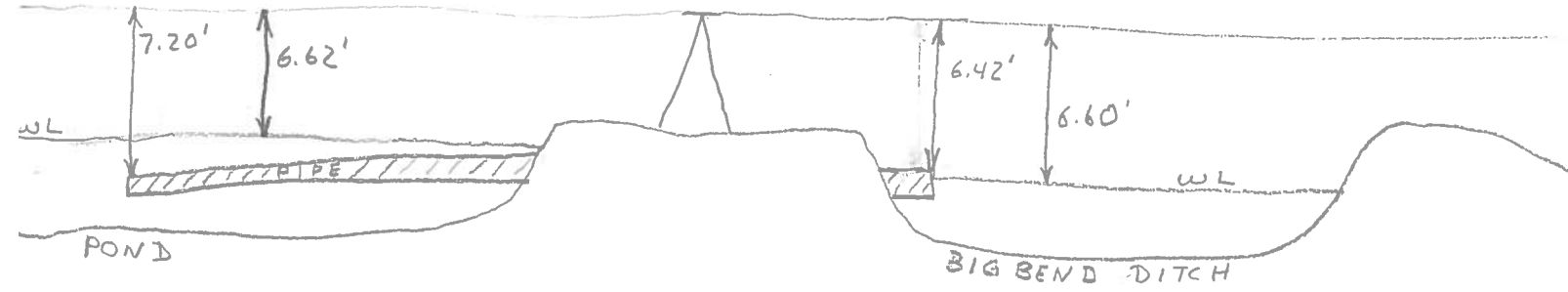
Questions regarding the data should be addressed to [Clarence W. Robison](#) or [Richard G. Allen](#), University of Idaho, Kimberly Research and Extension Center, 3793 North 3600 East, Kimberly, ID 83341. Telephone (208)-423-6610

University of Idaho

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36-16740 Stone . Sketch of Survey Measurements



1-16-13

Stone 36-16740

SURVEY INLET PIPE

-Chuck Steele

ditch end of Pipe - 6.42'

Water level in Ditch - 6.60

Pond End of Pipe - 7.2'

Pond Water Level - 6.62'

Peak to Peak on 8" D. corrugated metal pipe = 1.5"

Pipe makes a jog underground or under water.
Also changes from 8" corrugated steel to
8" PVC. ?

Runs cows in March-April - 20-40.

POND Volume:

Area - From Arc Map - 0.50 acre

Ave. Depth - from measurements - 1.39'

$$0.5 \text{ a.} \times 1.39' = 0.70 \text{ AF}$$

<u>Depths</u>	
1.4	1.5
1.5	1.3
1.3	1.3
1.4	
1.39 Ave.	

Ditch Loss - use 10% / mile over 3.5 miles measured on Arc Map

$$1^{\text{st}} \text{ mile} = 0.4 \text{ cfs} \times 0.1 = 0.04 \text{ cfs}$$

$$2^{\text{nd}} \text{ mile} = 0.36 \text{ cfs} \times 0.1 = 0.036 \text{ cfs}$$

$$3^{\text{rd}} \text{ mile} = 0.324 \text{ cfs} \times 0.1 = 0.0324 \text{ cfs}$$

$$0.5 \text{ mile} = 0.2916 \times 0.1 = 0.01458 \text{ cfs}$$

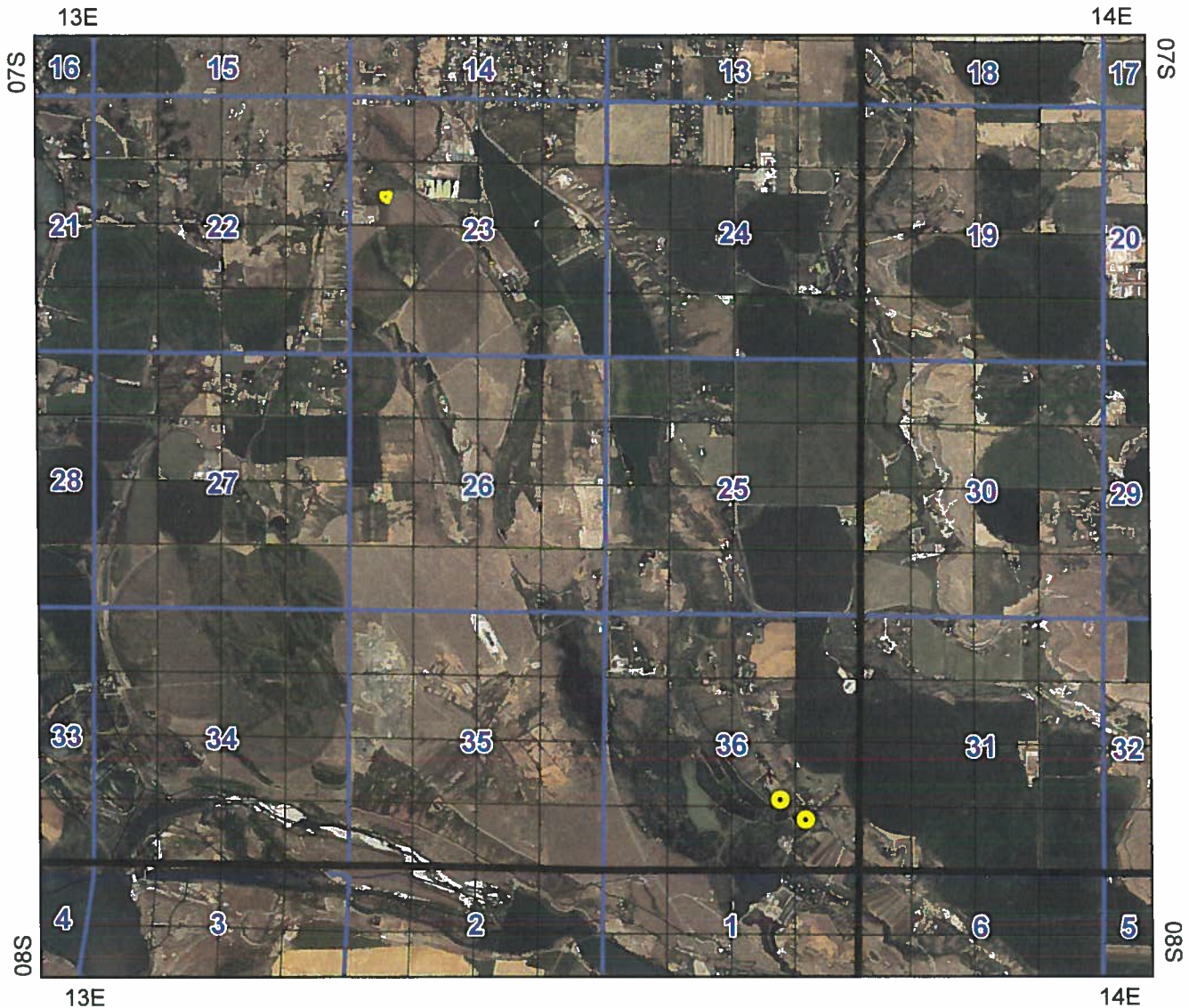
$$= 0.28 \text{ cfs after 3.5 miles}$$

State of Idaho
Department of Water Resources

Attachment To Water Right License

36-16740

This map depicts the RECREATION STORAGE place of use boundary for this water right at the time of this approval and is attached to the approval document solely for illustrative purposes.



- Point of Diversion
- Place Of Use Boundary
- Townships
- PLS Sections
- Quarter Quarters

0 0.45 0.9 1.8 Miles

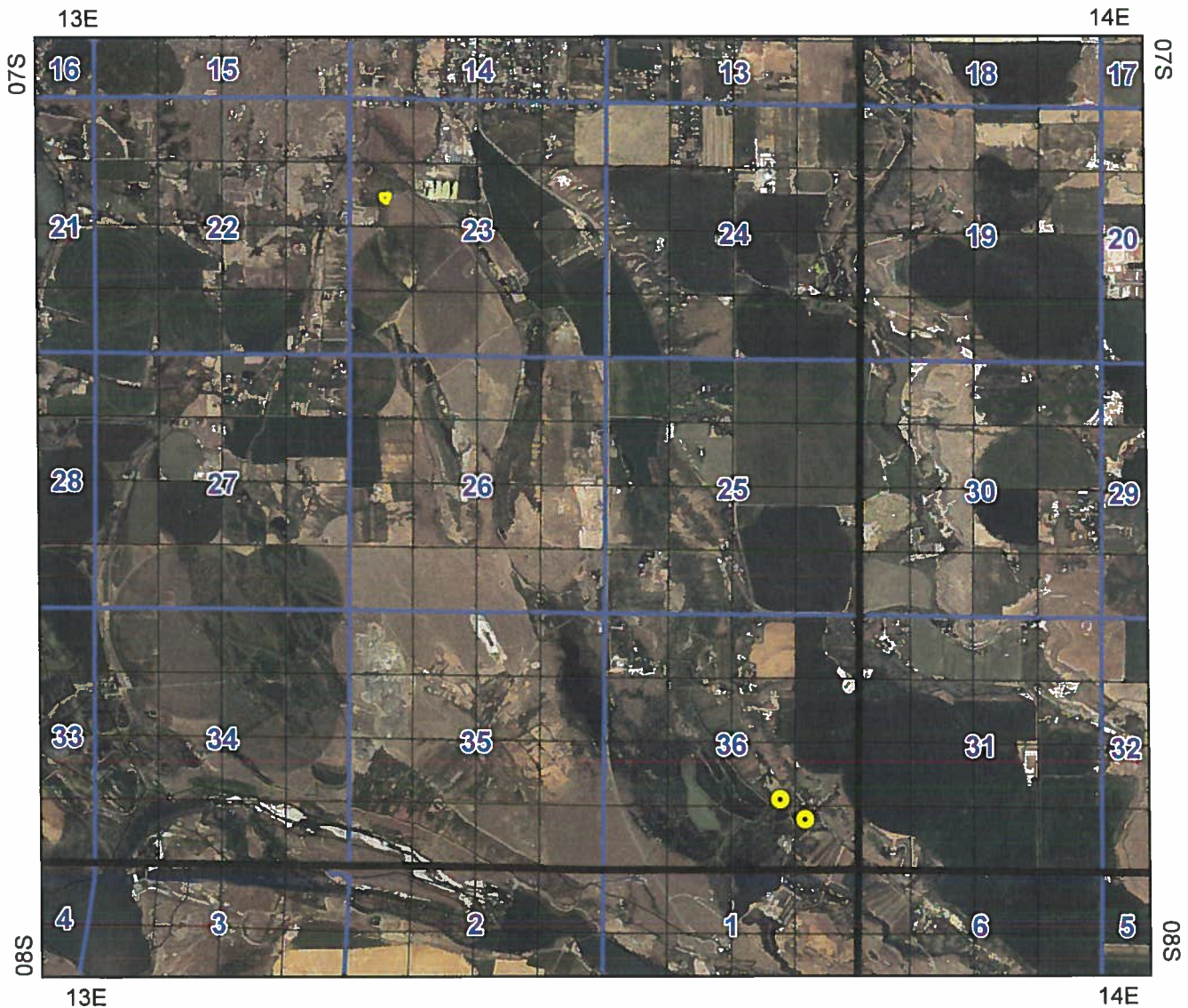


State of Idaho
Department of Water Resources

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36-16740

This map depicts the STOCKWATER STORAGE place of use boundary for this water right at the time of this approval and is attached to the approval document solely for illustrative purposes.



- Point of Diversion
- Place Of Use Boundary
- Townships
- PLS Sections
- Quarter Quarters

0 0.45 0.9 1.8 Miles



Big Bend Irrigation and Mining Co., Inc.
P O Box 334
Hagerman, ID 83332

April 23, 2009

RECEIVED
APR 28 2009
DEPT. OF WATER RESOURCES
SOUTHERN REGION

State of Idaho
Department of Water Resources
Southern Region
1341 Fillmore Street Suite 200
Twin Falls, Idaho 83301-3380

Attn: Jim Stanton, Senior Water Resource Agent

Re: Application For Permit: ID # 36-16740
Larry Stone and Nan Allison-Stone

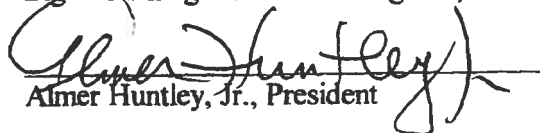
Dear Mr. Stanton,

At a Big Bend Board of Director's meeting held on April 14, 2009, The Board unanimously approved the Stone's Application For Permit, referenced above, with the following conditions:

1. Diversion to take place from October 15 to January 31.
2. Lockable head gates be in place at both the upstream diversion point and at the re-injection point, with both gates being open during the diversion period.
3. The proposed approximately one-half acre pond to be lined with clay to prevent seepage losses.

Sincerely,

Big Bend Irrigation and Mining Co., Inc.


Almer Huntley, Jr., President

cc: Larry and Nan Allison Stone
Chuck Steele