

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 13-7377

Exam Date: 8/13/2015

1. Current Owner: EVAN O KOLLER
12693 N 5800W
CORNISH UT 84320
(801)563-5467

2. Accompanied by: Mark Koller

Phone No: (208) 747-3300

Address: 80 S 1 E, Weston, ID 83286

Relationship to Permit Holder: Son of Evan Koller (who is deceased).

3. SOURCE

UNNAMED DRAINS

TRIBUTARY

SINKS

B. OVERLAP REVIEW

1. Other water rights with the same place of use: none
2. Other water rights with the same point of diversion: none

C. DIVERSION AND DELIVERY SYSTEM**1. LOCATION OF POINT(S) OF DIVERSION:**

UNNAMED DRAINS	NE1/4SE1/4	Sec. 23,	Twp 16S,	Rge 38E, B.M.
FRANKLIN County				
UNNAMED DRAINS	SW1/4SW1/4	Sec. 24,	Twp 16S,	Rge 38E, B.M.
FRANKLIN County				

Method of Determination: Aerial photography and site visit.

2.

PLACE OF USE: IRRIGATION

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
16S	38E	23													22.0	26.0	31.0	38.0	117.0
16S	38E	26	31.1																31.1

Total Acres: 148.1

PLACE OF USE: IRRIGATION FROM STORAGE

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
16S	38E	23													22.0	26.0	31.0	38.0	117.0
16S	38E	26	31.1																31.1

Total Acres: 148.1

PLACE OF USE: IRRIGATION STORAGE

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
16S	38E	23													X				
16S	38E	24										X							

Method of Determination: Aerial photography and site visit

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.

D. FLOW MEASUREMENTS

1. Measurements: No measurement could be taken at the time of the field exam. There was a minimal amount of water discharging into ponds.

E. FLOW CALCULATIONS☒ Additional Computation Sheets Attached

Measured Method: Hazen-Williams equation.

2 PVC discharge pipes. (3 inch and 6 inch).

Rate of diversion (2 inch) = 0.28 cfs.

Rate of diversion (6 inch) = 1.75 cfs.

Permit rate of diversion = 0.80 cfs

F. VOLUME CALCULATIONS**1. Volume Calculations for Irrigation:**

$$V_{I.R.} = (148.1 \text{ Acres Irrigated}) \times (3.5 \text{ Irrigation Requirement}) = 518.4 \text{ acre-feet}$$

$$V_{D.R.} = [0.80 \text{ (cfs)}] \times (214 \text{ Days}) \times 1.9835 = 339.6 \text{ acre-feet}$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = 339.6 \text{ acre-feet}$$

2. Volume Calculations for Other Uses:

Irrigation Storage for two ponds:

Total surface area = 1.5 acres

Pond depth = 10 ft X 0.40 = 4.0 ft

Volume = 1.5 acres X 4.0 ft = 6.0 acre-feet X 2 (multiple fills per year) = 12.0 acre-feet.

G. NARRATIVE/REMARKS/COMMENTS

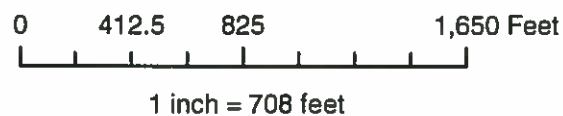
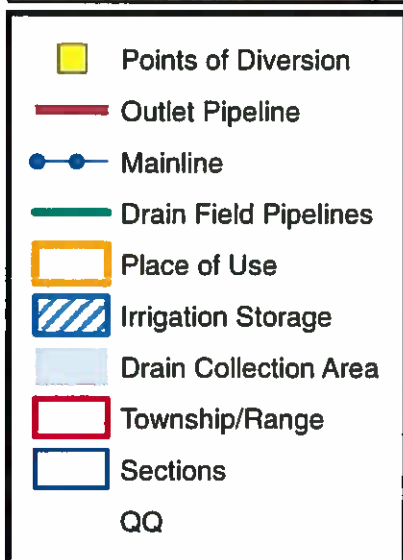
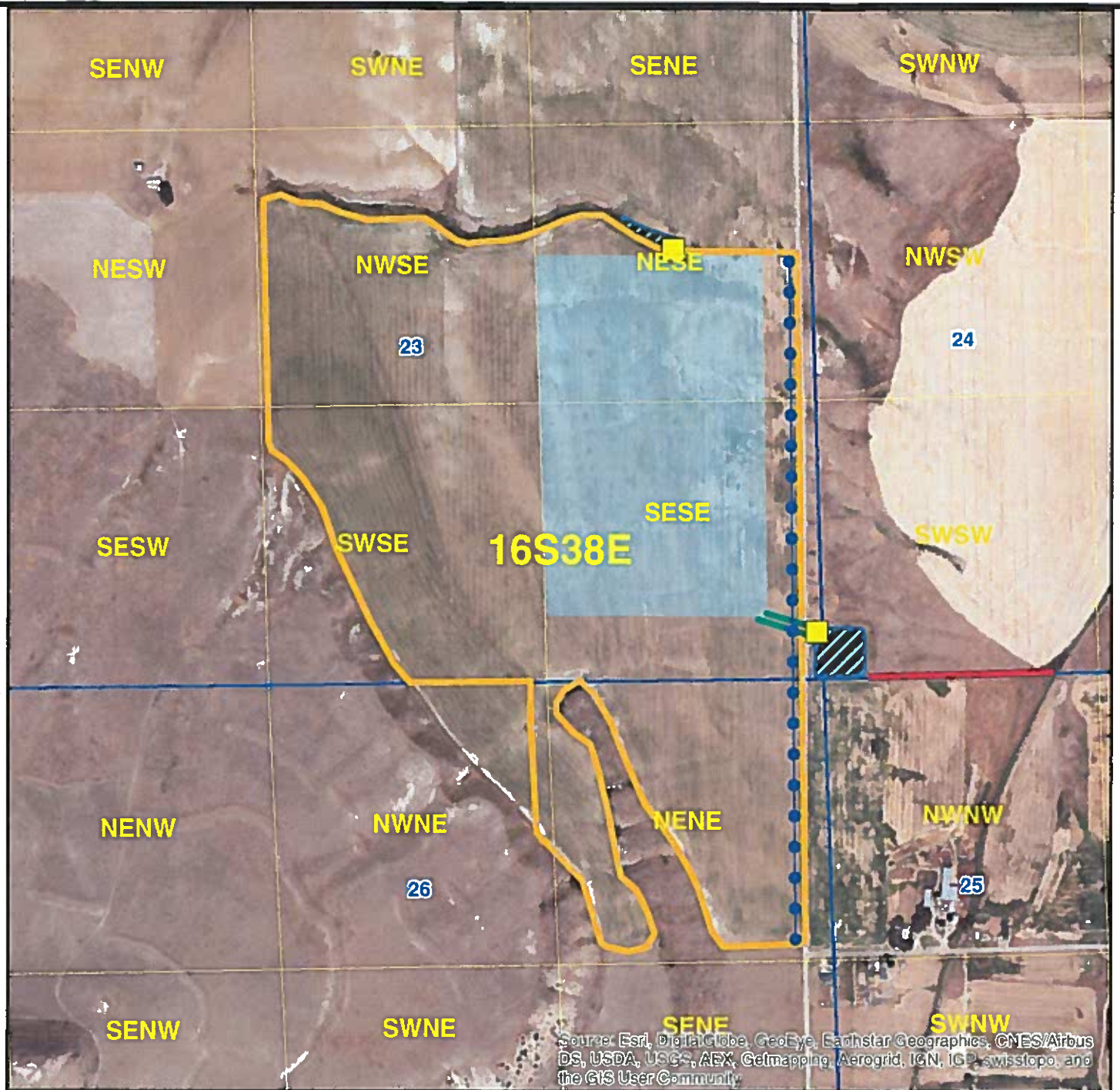
A field exam for this right was started in 1998 but was never completed. Water delivery system includes two irrigation storage ponds and a large drain field (approximately 43 acre in surface area). Portable pumps divert water from storage ponds to a 148.1 acre place of use located on the west side of road (S 4000 W). The 148.1 acres is irrigated with 25 handlines and 2 large portable rain birds. Storage ponds fill multiple times during the year.

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>
IRRIGATION	04/01 to 10/31	0.800 CFS	339.60 AF
IRRIGATION FROM STORAGE	04/01 to 10/31		12.00 AF
IRRIGATION STORAGE	01/01 to 12/31		12.00 AF
DIVERSION TO STORAGE	01/01 to 12/31	0.800 CFS	
<u>Totals:</u>		0.800 CFS	351.60 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 (Nature of use)**I. AUTHENTICATION**Field Examiner's Name Blake Jordan Date 8/24/2015

Reviewer _____ Date _____



13-7377

June 5, 1998 Lower Storage Pond



looking South East at exit to pond

looking South at inlets in North West Corner



Perment # 13-07377

8/13/2015

Lower Storage pond



8/13/2015 Headgate, Upper Storage Pond



Hazen-Williams Friction Loss Equation	Hazen-Williams friction loss calculator for water flow in pipes
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Hazen-Williams pipe friction calculation is mobile-device-friendly as of June 25, 2014

Solve for: Discharge and Velocity ▼ Select units: Use feet and seconds units ▼ © 2014 LMNO Engineering, Research, and Software, Ltd. http://www.LMNOeng.com	Click to Calculate k = 1.318 <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; padding: 2px;">Discharge, Q (ft³/s):</td> <td style="width: 40%; padding: 2px; border: 1px solid black;">0.283427941036335784</td> </tr> <tr> <td style="padding: 2px;">Velocity, V (ft/s):</td> <td style="padding: 2px; border: 1px solid black;">5.77394660176525942</td> </tr> <tr> <td style="padding: 2px;">Pipe Diameter, D (ft):</td> <td style="padding: 2px; border: 1px solid black;">25</td> </tr> <tr> <td style="padding: 2px;">Pipe Length, L (ft):</td> <td style="padding: 2px; border: 1px solid black;">1887</td> </tr> <tr> <td style="padding: 2px;">Hazen-Williams C:</td> <td style="padding: 2px; border: 1px solid black;">150</td> </tr> <tr> <td style="padding: 2px;">Head Loss, h_f (ft):</td> <td style="padding: 2px; border: 1px solid black;">69</td> </tr> <tr> <td style="padding: 2px;">Energy Slope, S (ft/ft):</td> <td style="padding: 2px; border: 1px solid black;">0.0365659777424483315</td> </tr> </table>	Discharge, Q (ft ³ /s):	0.283427941036335784	Velocity, V (ft/s):	5.77394660176525942	Pipe Diameter, D (ft):	25	Pipe Length, L (ft):	1887	Hazen-Williams C:	150	Head Loss, h _f (ft):	69	Energy Slope, S (ft/ft):	0.0365659777424483315
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Units: ft=foot, m=meter, s=second.

Hazen-Williams Equation: $V = k C (D/4)^{0.63} S^{0.54}$ where $S = h_f / L$ and $Q = V \pi D^2 / 4$

k is a unit conversion factor:

k=1.318 for English units (feet and seconds). k=0.85 for SI units (meters and seconds)

C=Hazen-Williams Coefficient. D=Pipe inside diameter.

Hazen-Williams Coefficient (C) varies from approximately C=60 for 40-year old cast iron pipe to C=150 for new plastic pipe. The higher the C, the smoother the pipe. [Table of Hazen-Williams Coefficients.](#)

The Hazen-Williams method is valid for water flowing at ordinary temperatures of 40 to 75 °F (4 to 25 °C) through pressurized pipes. The Hazen-Williams equation is typically used to analyze city water supply systems. For other liquids or gases, the [Darcy-Weisbach method](#) should be used. Major loss (h_f) is the energy (or head) loss (expressed in length units - think of it as energy per unit weight of fluid) due to friction between the moving fluid and the pipe wall. It is also known as friction loss. The Darcy-Weisbach method is generally considered more accurate than the Hazen-Williams method. However, the Hazen-Williams method is very popular, especially among civil engineers, since its friction coefficient (C) is not a function of velocity or pipe diameter. Hazen-Williams is simpler than Darcy-Weisbach for calculations where you are solving for flowrate (discharge), velocity, or diameter. More [Discussion and References.](#)

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Related calculations:

[Design of Circular Water Pipes Calculator \(Hazen-Williams\)](#)

[Circular Water Pipes with Pump Curve Calculator \(Hazen-Williams\)](#)

[Table of Hazen-Williams Coefficients \(C\)](#)

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Hazen-Williams Friction Loss Equation

Hazen-Williams friction loss calculator for water flow in pipes

Hazen-Williams pipe friction calculation is mobile-device-friendly as of June 25, 2014

Solve for: Discharge and Velocity ☒		Click to Calculate	k = 1.318
Select units: Use feet and seconds units ☒		Discharge, Q (ft ³ /s): 1.75449263895851937	Velocity, V (ft/s): 8.93555763547495729
© 2014 LMNO Engineering, Research, and Software, Ltd. http://www.LMNOeng.com		Pipe Diameter, D (ft): .5	Pipe Length, L (ft): 1887
		Hazen-Williams C: 150	Head Loss, h _f (ft): 69
		Energy Slope, S (ft/ft): 0.0365659777424483315	

Units: ft=foot, m=meter, s=second.

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