

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 55-13896

Exam Date: 06/06/2019

1. Current Owner:
THE 45 LLC C/O CHARLES CONN
PO BOX 9080
KETCHUM ID 83340
2. Accompanied by: Bob Hendricks
Phone No: 541-212-6582
Address: N/A
Relationship to permit Holder: Caretaker of The 45 Ranch

3. **SOURCE:**
SOUTH FORK OWYHEE RIVER

Tributary
OWYHEE RIVER

Method of Determination: GIS/Department records

B. OVERLAP REVIEW

1. Other water rights with the same place of use: YES Overlap

Water Right No.	Source	Purpose of Use	Basis
55-4067	South Fork Owyhee River	Irrigation	GIS

Comments: The POU and POD's are shared with irrigation right 55-4067. This right does not have any other right at the POU or POD's with the stockwater or wildlife uses.

2. Other water rights with the same point-of-diversion: YES Overlap

Water Right No.	Source	Purpose of Use	Basis
55-4067	South Fork Owyhee River	Irrigation	GIS

Comments: The POU and POD's are shared with irrigation right 55-4067. This right does not have any other right at the POU or POD's with the stockwater or wildlife uses.

C. DIVERSION AND DELIVERY SYSTEM

1. LOCATION OF POINT(S) OF DIVERSION:

SOUTH FORK OWYHEE RIVER SE¼ SE¼, Sec. 25, Twp 14S, Rge 05W, B.M. OWYHEE County
SOUTH FORK OWYHEE RIVER SE¼ SW¼, Sec. 25, Twp 14S, Rge 05W, B.M. OWYHEE County

Method of Determination: GIS/Department records

PLACE OF USE: STOCKWATER

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
14S	05W	25								S	S			S					
14S	05W	36					\$												

PLACE OF USE: WILDLIFE

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
14S	05W	25							W	W				W					

PLACE OF USE: WILDLIFE STORAGE

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
14S	05W	25												X					

Method of Determination: GIS/Department records

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.

Well or Diversion ID No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
	Deutz	61	11958783	Berkely	001C13B
Model #: B66161	Honda GX 1600	N/A	CNFD61005412002	Banjo	2" Discharge Pipe

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
	Flow Tracker	SonTek	9000-00115	P4554		2/18/15

2. Measurements:

Measured ditch flowing into large pond: 1.847 cfsSprinkler measurements of 4 nozzles at .63", 2 nozzles at .25" and 1 nozzle at .375". The nozzle pressure was estimated at 45 psi. Combined nozzle diameters at 45 psi produce an output of 371.09 gpm or .83 cfs.**E. FLOW CALCULATIONS**☒ Additional Computation Sheets Attached

Measured Method:

Ditch flow measurement = 1.847.

Sprinkler measurement = .83 cfs

Combined diversion 2.68 cfs

Permit Allows = 1.28 cfs

Recommended diversion rate of 1.28 cfs as allowed by the permit.

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation: N/A

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

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

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

$$1.28\text{cfs} \times 1.9835 \times 365 \text{ days} = \mathbf{927.0 \text{ AF}}$$

1 large pond at .6 acres and 8 ft. average depth = **6.4 AF** (See attached pond sheet for calculations)

$$300 \text{ head} \times 12\text{gpd} \times 365 \text{ days} = 1,314,000 \text{ gpd} (1,314,000 \text{ gpd} / 325,850 \text{ gal}) = \mathbf{4.0 \text{ AF for Stock}}$$

927.0 (total volume) -- 6.4 (Pond volume) -- 4.0 (Stock volume) -- 224.0 (irrigation volume from right 55-4067) = **693.0 AF for wildlife.**

$$\text{Total volume} = 6.4\text{AF} + 4.0\text{AF} + 693.0 = \mathbf{703.4\text{AF}}$$

The wildlife storage volume did not incorporate the smaller low lying areas that collected water. Rather only the single large pond on the property is to be considered for wildlife storage.

G. NARRATIVE/REMARKS/COMMENTS

The property borders the South Fork Owyhee River (SFOR) in Southwestern Idaho. This is also the location of the confluence of the Little Owyhee and SFOR. Permit 55-13896 has two points of diversion (POD's). The first POD is located upstream of the place of use (POU) and diverts water from the SFOR at a dam. There is a headgate at the dam. This headgate feeds into a 24" underground pipeline. The pipeline curves around a bend and parallels the river ending at a ditch just south of the large pond on the property. This large pond is located adjacent to the main domestic structures. According to GIS calculations, the pipeline is approximately .9 miles from the headgate to the point where it discharges into the ditch. The ditch continues for approximately .07 miles where it feeds into the large pond. From the large pond, water discharges into three separate 12" culverts on the Northern side and moves water out of the pond into the wildlife area. At the time of the field exam, the wildlife area was largely saturated and marsh-like. Of the three culverts discharging water from the large pond, the Eastern most culvert closest to the domestic structures, moves water into a separate ditch. This ditch carries water out towards the Eastern side of the property along the POU and discharges the water throughout the wildlife area.

The second POD consists of a screened hose, a 61 Hp diesel pump and portable pressure tank located on the SFOR. Water is pumped up approximately 10 feet from the river. A large lay-flat hose connects from the pump to a 6" underground mainline. This mainline "T's" off near the pump and goes North and South along the airstrip. The mainline has 5 risers above ground that connect to 5 portable sprinklers. 4 of these sprinklers have nozzles that are .63" in size and 1 sprinkler has a 3/8" nozzle. The portable sprinklers were not connected at the time of the filed exam. The use of the sprinklers to irrigate the runway are covered by water right 55-4067. The pump can also hook up to the lay flat hose and pump water over to the large pond if the flow in the ditch and pipeline from the SFOR becomes infrequent or is not at all possible. The actual location of this POD was approximately .25 miles downriver from the location described on the permit. An amendment of license will be necessary to reflect the change in POD.

The permit also listed stockwater use for 200 head of cattle. The caretaker, Bob Hendricks, informed us that the stockwater rights for the property were sold around 2014. The stockwater use will remain on the license since water was used for stock during the development period.

In addition to the single large pond, there were multiple low lying areas that collected water on the Northeastern part of the property. Aerial imagery from the last 8 years in GIS and Google Earth show that the low lying areas accumulated into 5 smaller "ponds" where water naturally collects. According to Dennis Fitzpatrick, co-owner of the 45 Ranch, the small ponds formed when the large pond was established in 2008. Additionally, these 5 smaller ponds are in the path of the historic SFOR river channel. The smaller ponds were not constructed and are the result of the wildlife use filling in depression areas. As a result, the 5 small ponds are covered by the wildlife use. Regarding the large excavated pond, the existing irrigation right on the property and this permit do not grant any authorization of storage of water. The licensing amendment will also account for the storage use in the large constructed pond. The license will be amended to include diversion to storage and wildlife storage. The current use of water under this permit is basically wildlife flooding since the large pond disperses water out into the marshy wildlife area. No additional volume will be necessary to account for the wildlife flooding occurring from the large pond as evaporation occurs equally from wildlife storage and wildlife flooding areas.

The permit allowed a diversion rate of 1.28 cfs. At the time of the field exam, discharge from the ditch leading into the large pond was measured at 1.85 with the flow tracker. Although a measuring device is not required on the license, we suggested to Bob Hendricks, that the owner install a cipoletti weir. We explained that this adequate and cost effective flow measurement device could help ensure that the proper amount of water is being diverted throughout the year.

Overlap:

The POU and POD's are shared with irrigation right 55-4067. This right is also owned by the 45 LLC. Permit 55-13896 does not have any other rights at the POU or POD's.

Conditions: We removed condition 1 (26A) as it was not relevant to the license. Condition 2 (x02) was removed from the license since there are no stock at the POU. Conditions 2 (004), 4 (F06), 5 (x35) and 6(01M) were carried over to licensing. Condition 259 was added to the license to account for the amendment of the license adding wildlife storage and diversion to storage.

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

H. RECOMMENDATIONS

1. Recommended Amounts

<u>Beneficial Use</u>	<u>Period of Use</u>	<u>Rate of Diversion</u>	<u>Volume</u>
STOCKWATER	01/01 to 12/31	0.07 CFS	4.0 AF
WILDLIFE	01/01 to 12/31	1.28 CFS	693.0 AF
WILDLIFE STORAGE	01/01 to 12/31		6.4 AF
DIVERSION TO STORAGE	01/01 to 12/31	1.28 CFS	

Totals: 1.28 CFS 703.4 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 ☒ None

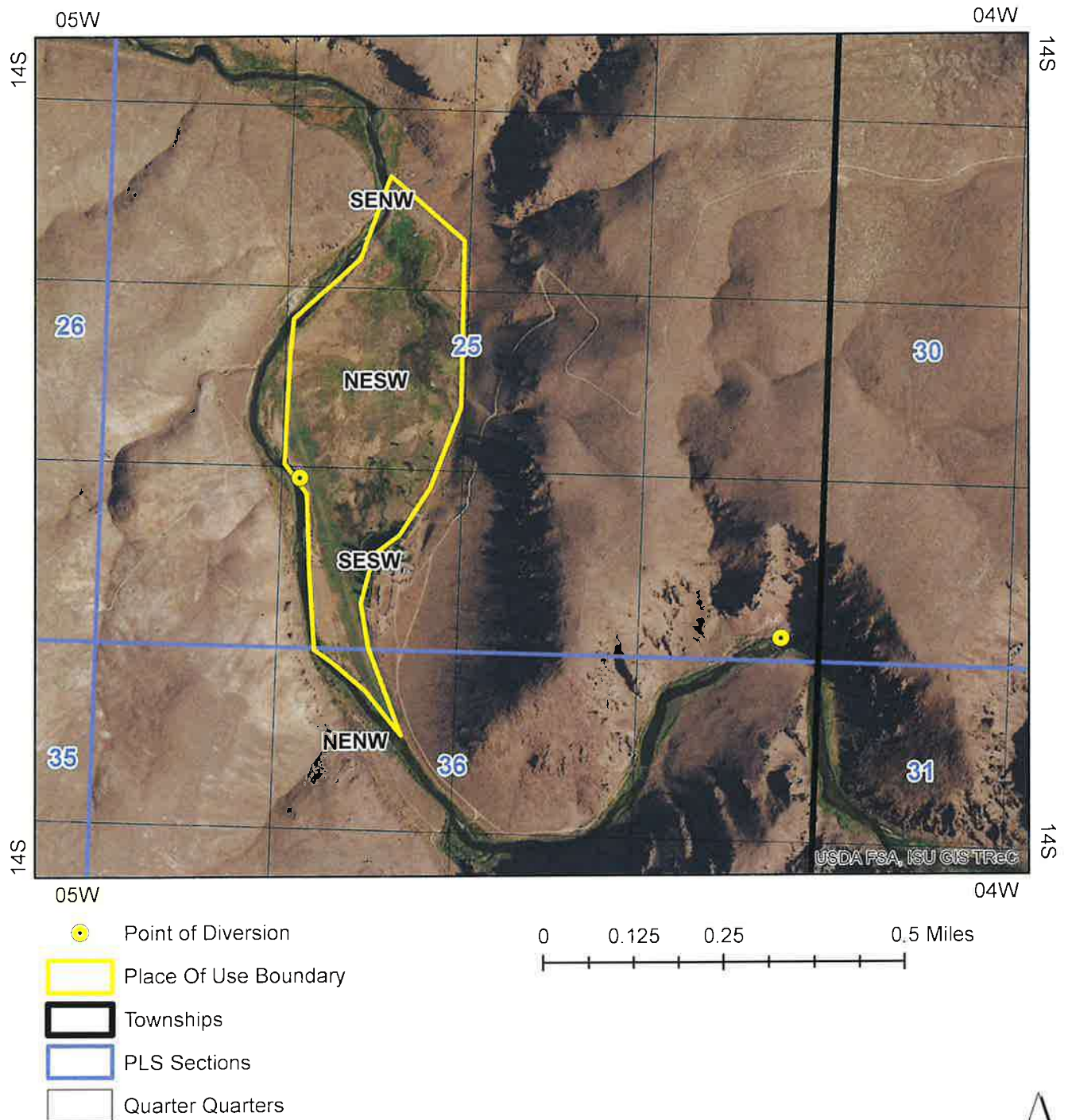
I. AUTHENTICATION Alex Dagleish - Water Resource Agent

Field Examiner's Name Alex Dagleish Date 6-27-19

Reviewer Daniel A. Miller Date 6-27-19

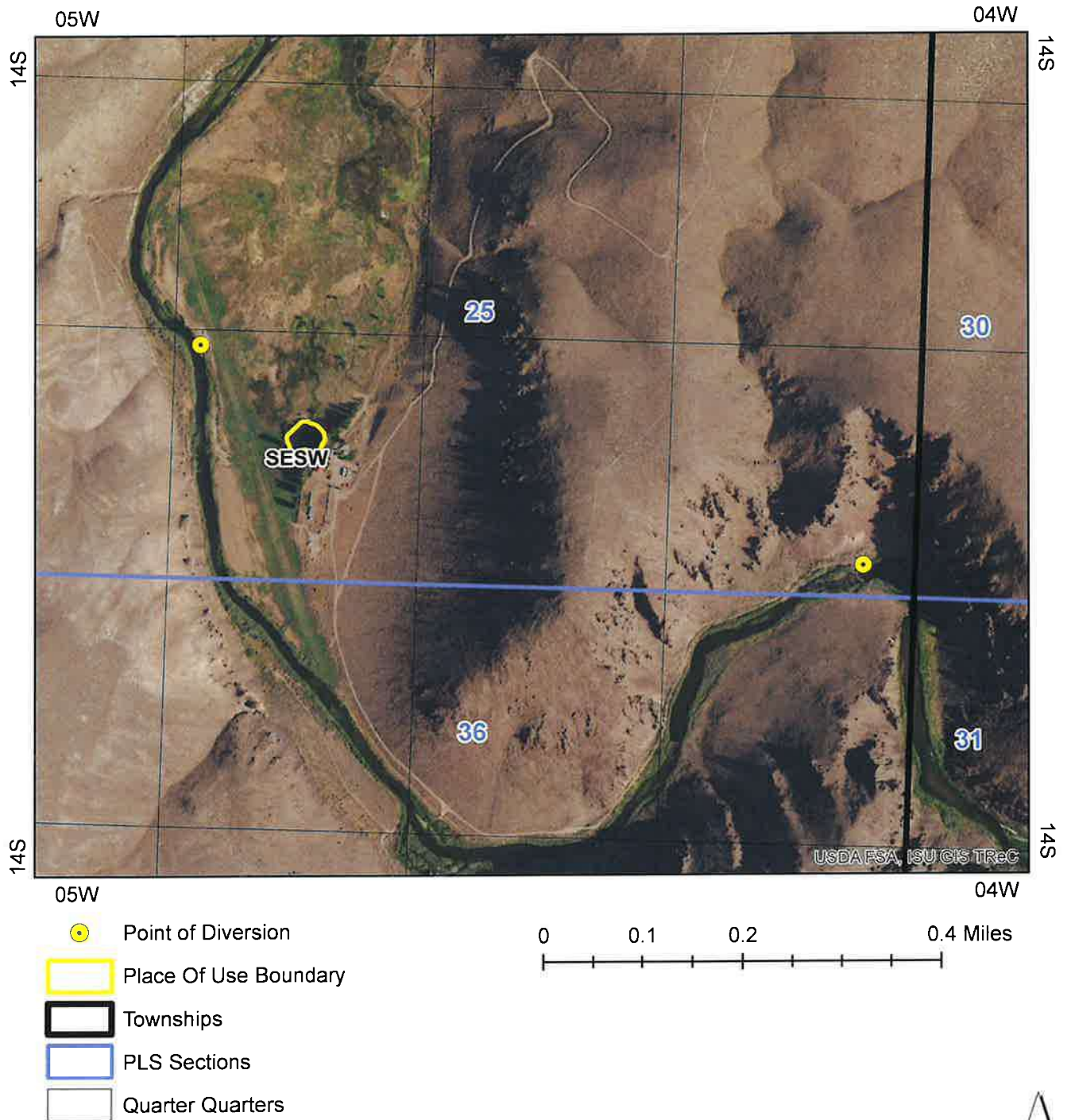
State of Idaho
Department of Water Resources
Attachment to Field Exam
55-13896

This map depicts the STOCKWATER 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.



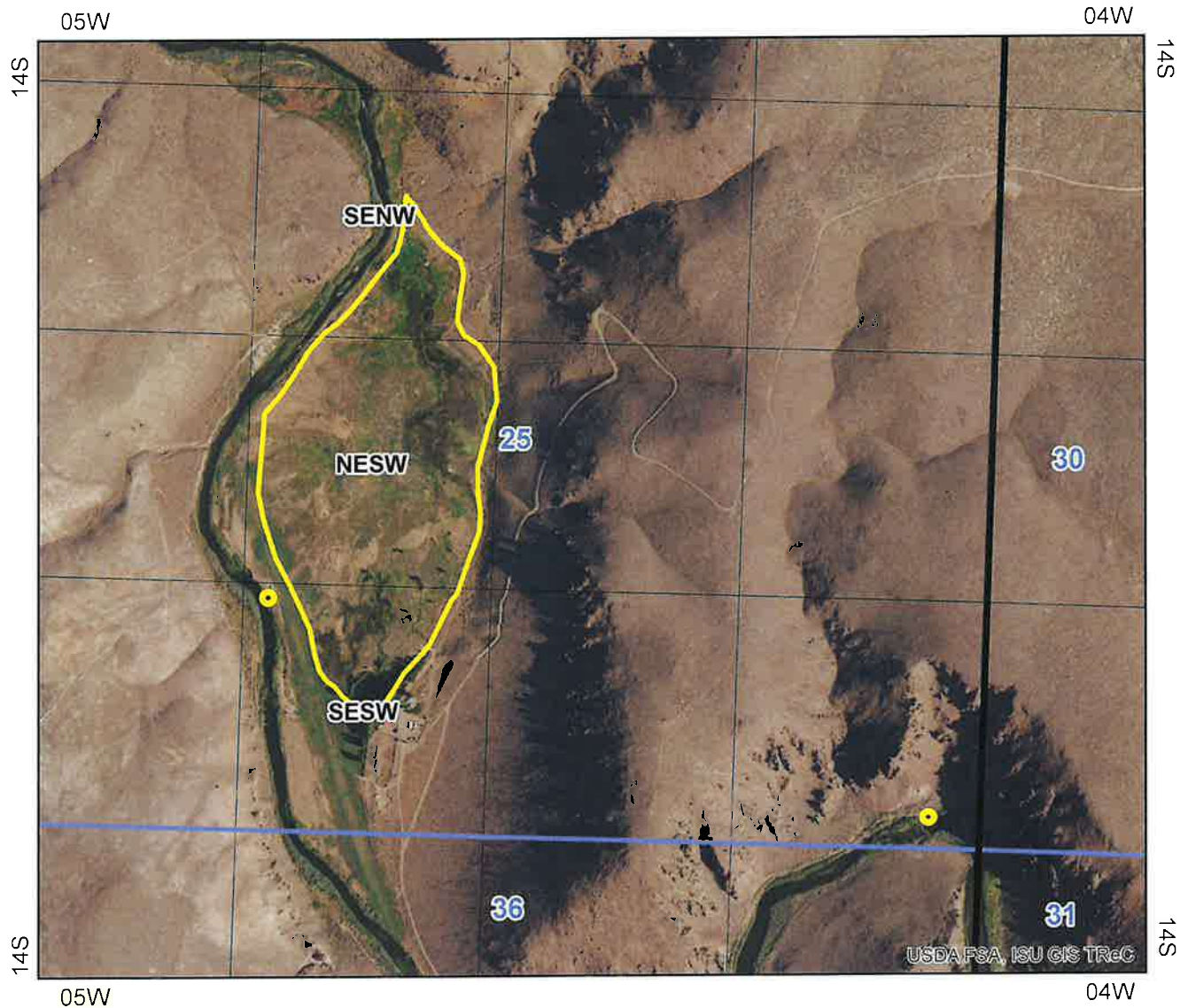
State of Idaho
Department of Water Resources
Attachment to Field Exam
55-13896

This map depicts the WILDLIFE 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.



State of Idaho
Department of Water Resources
Attachment to Field Exam
55-13896

This map depicts the WILDLIFE 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 0.1 0.2 0.4 Miles



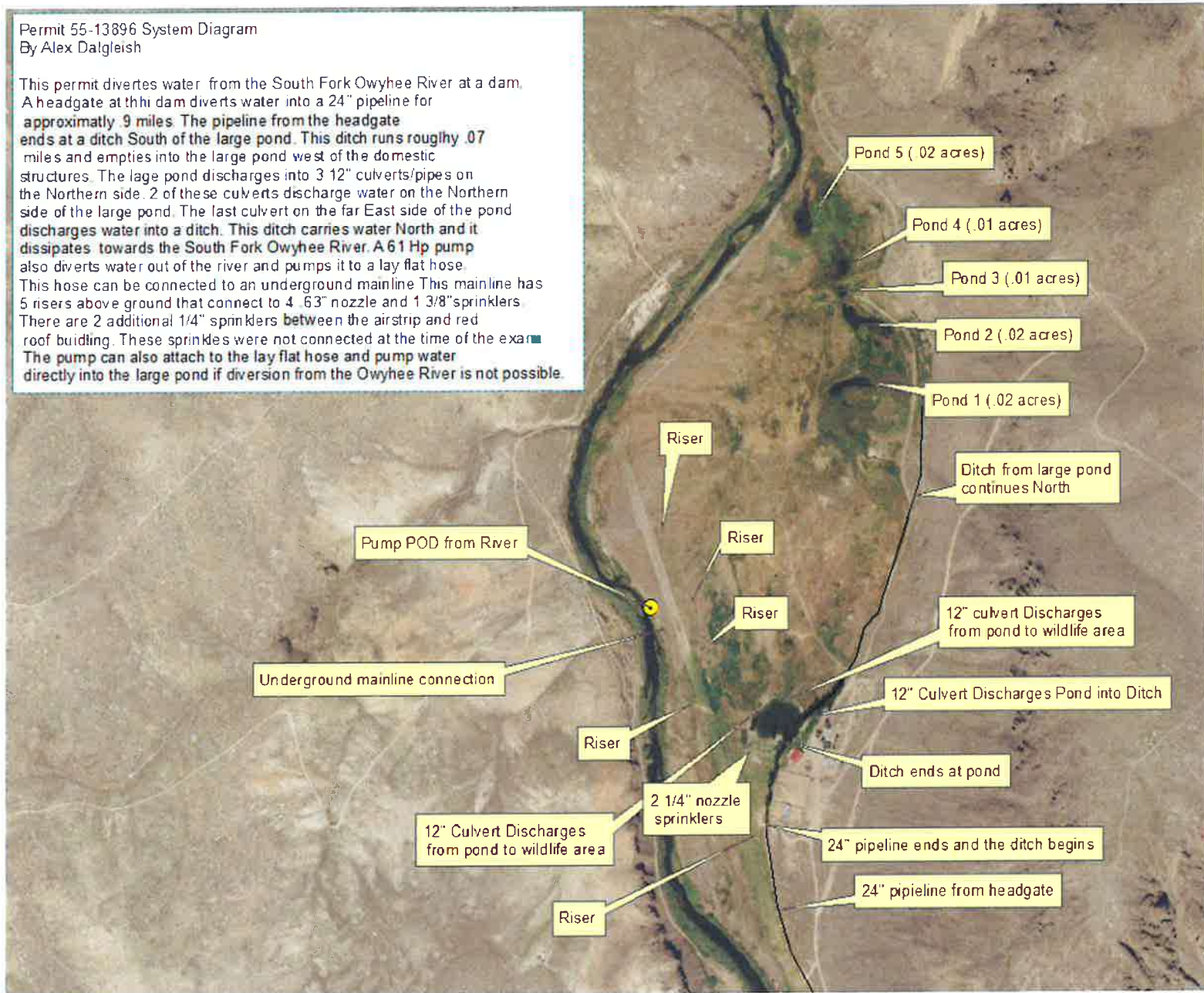


Permit 55-13896 System Diagram
By Alex Dalglish

This permit diverts water from the South Fork Owyhee River at a dam. A headgate at this dam diverts water into a 24" pipeline for approximately .9 miles. The pipeline from the headgate ends at a ditch South of the large pond. This ditch runs roughly .07 miles and empties into the large pond west of the domestic structures. The large pond discharges into 3 12" culverts/pipes on the Northern side. 2 of these culverts discharge water on the Northern side of the large pond. The last culvert on the far East side of the pond discharges water into a ditch. This ditch carries water North and it dissipates towards the South Fork Owyhee River. A 61 Hp pump also diverts water out of the river and pumps it to a lay flat hose. This hose can be connected to an underground mainline. This mainline has 5 risers above ground that connect to 4 .63" nozzle and 1 3/8" sprinklers. There are 2 additional 1/4" sprinklers between the airstrip and red roof building. These sprinklers were not connected at the time of the exam. The pump can also attach to the lay flat hose and pump water directly into the large pond if diversion from the Owyhee River is not possible.

Permit 55-13896 System Diagram
By Alex Dalgleish

This permit diverts water from the South Fork Owyhee River at a dam. A headgate at this dam diverts water into a 24" pipeline for approximately 9 miles. The pipeline from the headgate ends at a ditch South of the large pond. This ditch runs roughly .07 miles and empties into the large pond west of the domestic structures. The large pond discharges into 3 12" culverts/pipes on the Northern side. 2 of these culverts discharge water on the Northern side of the large pond. The last culvert on the far East side of the pond discharges water into a ditch. This ditch carries water North and it dissipates towards the South Fork Owyhee River. A 61 Hp pump also diverts water out of the river and pumps it to a lay flat hose. This hose can be connected to an underground mainline. This mainline has 5 risers above ground that connect to 4 .63" nozzle and 1 3/8" sprinklers. There are 2 additional 1/4" sprinklers between the airstrip and red roof building. These sprinkles were not connected at the time of the exam. The pump can also attach to the lay flat hose and pump water directly into the large pond if diversion from the Owyhee River is not possible.



Total Storage Calculations

FILE NUMBER	55-13896
REVIEWER	Alex Dalglish
DATE	6/11/2019

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the total seepage, evaporation and fill capacity required for a pond.

User Input
Calculated value
Formula Explanations

Surface Area (AC.)	0.6	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	8	"Average Pond Depth" depicts the actual depth of the pond either measured or estimated. Note: If you know the maximum depth and not the average depth, the Field Examiner's Handbook suggests multiplying the maximum depth by 0.4 to get the average depth, or you can use any method that seems reasonable to attain average depth.
Pond Capacity (AF)	4.8	Pond Capacity is calculated by multiplying the Pond Surface Area by the Average Pond Depth. If you know the capacity, divide the capacity by surface area and enter the average pond depth in the space above. Note: If pond capacity is determined using a method shown on the "Pond Capacity" sheet, the user may need to modify the value of "Pond Capacity" (cell B9) manually. Note that if the value is modified manually, the formula will be altered for future use.

Multiple Fill Volume Above Initial Fill to Fulfill From Storage Needs- "Multiple Fills" (AF)	0	The "Multiple Fill Volume Above Initial Fill" is the acre-feet of water required to meet a <i>from storage</i> component if the <i>from storage</i> component exceeds a one time fill. This section should not include the amount of water needed to fill the pond initially or the amount of water needed to maintain the pond level due to evaporation or seepage. For example: if a pond has a capacity of 5 acre feet and 2.5 acre feet of seepage and evaporation, but the pond is used for irrigation that requires 10 acre feet of from storage for the irrigation use, then you would insert 5 acre feet into this location (10 acre feet needed - 5 acre feet from the initial fill = 5 acre feet of additional storage needed). Note: You must have a "From Storage" component exceeding the initial fill on the permit to include a volume in this space.
Estimated Seepage Loss (AF)	0.0	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	1.6	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	6.4	The "Total Volume Required" is calculated by adding the Pond Capacity, Multiple Fills, Seepage Loss, and Evaporation Loss amounts to determine the total amount of storage required.

Flow Rate into Pond (CFS)	1.28	The "Flow Rate into Pond" depicts the actual flow, either measured or estimated, into the pond. For offstream facilities, this will be equivalent to "diversion to storage" rate.
Highest Daily Evaporation Rate From Evaporation Tab. (mm/Day)	5.14	This number is carried over from the "Evaporation Loss" sheet. It is the highest recorded number in the "Precipitation Deficit Table".
Required Daily Maintenance Volume (AF/Day)	0.01	"Required Daily Maintenance Volume" is the maximum volume of water needed on any given day during the year to maintain pond volume. It is calculated by adding the highest daily evaporation loss to the average daily seepage loss in acre feet. The average daily seepage loss is calculated by dividing the "Estimated Seepage Loss" by 365 days. This is acceptable, since the seepage rate shouldn't vary throughout the season unless the pond completely freezes over during the winter months. The highest daily evaporation loss is calculated by dividing the Highest Daily Evaporation Rate by the 304.8 conversion factor and multiplying this number by the pond surface area to attain a combined daily acre feet requirement.
Minimum Maintenance Flow (CFS)	0.01	The "Minimum Maintenance Flow" is the minimum amount of flow required to maintain the level of the pond. This number is determined by dividing the "Maximum Required Daily Maintenance Volume" by 1.9835. This flow can be used to determine if the flow rate into the pond is adequate to maintain the pond level.
Days Required to Fill the Pond	2	The "Days Required to Fill the Pond" is calculated by dividing the "Pond Capacity" by the "Flow Rate" minus "Minimum Maintenance Flow" multiplied by 1.9835. This section will assist you in determining if the flow rate being diverted to the pond is adequate to fill the pond while maintaining the pond level. The length of time to fill the pond will help determine if the flow rate is adequate for the size of pond being proposed. If this number is approximately 6 months (180 days) or more, the reviewer should have a discussion with the applicant to make sure he/she understands that it will take a significant length of time to fill the pond.
Days Required to Fill the Pond at 13,000 Gallons per Day	161	Some water users may want to fill a pond under the 13,000 gallons per day domestic exemption. The "Days Required to Fill the Pond at 13,000 Gallons per Day" is calculated by converting the "Pond Capacity" and the "Required Daily Maintenance Volume" to gallons. The "Pond Capacity" is then divided by 13,000 gallons minus the "Required Daily Maintenance Volume" in gallons to determine the number of days to fill pond. If this number is approximately 6 months (180 days) or more, the reviewer should have a discussion with the applicant to make sure he/she understands that it will take a significant length of time to fill the pond. Negative values indicate that the supply of 13,000 gallons per day is not enough volume to overcome the required daily maintenance volume; the pond will never fill.

Flow Rate Calculator Summary

Sprinkler Nozzle Flow Rate Calculator

Summary of Methodology

This spreadsheet tool supports the estimation of the flow rate from a sprinkler nozzle or series of sprinkler nozzles. The user can specify up to three different sprinkler nozzle types, and the total number of each of the three types of nozzles. The equation used to calculate the flow rate(s) is a simplified form of the Bernoulli Equation, which along with several supporting relationships, were developed from Hagan et. al. 1987, Jensen 1983, and Lindeburg 1999.

Summary of User Input

	Nozzle Type 1	Nozzle Type 2	Nozzle Type 3
C Value:	1	1	1
Nozzle Press.:	45	45	45
Nozzle Diam.:	0.25	0.63	0.375
No. of Nozzles:	2	4	1

Summary of Results and Output

Type 1 Nozzle(s):	25.03	gpm
Type 2 Nozzle(s):	317.90	gpm
Type 3 Nozzle(s):	28.16	gpm
Combined:	371.09	gpm

References

Hagan, R.M., Haise, H.R., & Edminster, T.W., *Irrigation of Agricultural Lands*, Agronomy No. 11, 5th Printing. American Society of Agronomy, Madison, WI, USA, 1987.
Jensen, M.E., *Design and Operation of Farm Irrigation Systems*, Revised Printing, American Society of Agricultural Engineers, 1983.
Lindeburg, Michael R., *Civil Engineering Reference Manual*. Professional Publications, Belmont, CA, 1999.

Applicant: Alex Dagleish

Date: 06/12/2019

WR Number: 55-13896

Notes:

Discharge Measurement Summary

Date Generated: Fri Jun 7 2019

File Information

File Name ALEX.WAD
Start Date and Time 2019/06/06 13:06:16

Site Details

Site Name
Operator(s) DO

System Information

Sensor Type FlowTracker
Serial # P4554
CPU Firmware Version 3.9
Software Ver 2.30
Mounting Correction 0.0%

Units (English Units)

Distance ft
Velocity ft/s
Area ft²
Discharge cfs

Discharge Uncertainty

Category	ISO	Stats
Accuracy	1.0%	1.0%
Depth	0.8%	9.3%
Velocity	1.0%	12.0%
Width	0.3%	0.3%
Method	3.9%	-
# Stations	3.6%	-
Overall	5.5%	15.2%

Summary

Averaging Int.	40	# Stations	14
Start Edge	LEW	Total Width	5.100
Mean SNR	55.9 dB	Total Area	2.230
Mean Temp	67.29 °F	Mean Depth	0.437
Disch. Equation	Mid-Section	Mean Velocity	0.8286
		Total Discharge	1.8478

Measurement Results

St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	13:06	1.60	None	0.350	0.0	0.0	0.0000	1.00	-0.0003	0.070	0.0000	0.0
1	13:06	2.00	0.6	0.450	0.6	0.180	-0.0003	1.00	-0.0003	0.180	-0.0001	0.0
2	13:09	2.40	0.6	0.450	0.6	0.180	0.0020	1.00	0.0020	0.180	0.0004	0.0
3	13:11	2.80	0.6	0.350	0.6	0.140	0.0131	1.00	0.0131	0.140	0.0018	0.1
4	13:12	3.20	0.6	0.350	0.6	0.140	0.1778	1.00	0.1778	0.140	0.0249	1.3
5	13:15	3.60	0.6	0.350	0.6	0.140	0.1621	1.00	0.1621	0.140	0.0227	1.2
6	13:16	4.00	0.6	0.400	0.6	0.160	1.2618	1.00	1.2618	0.160	0.2018	10.9
7	13:22	4.40	0.6	0.750	0.6	0.300	1.8035	1.00	1.8035	0.300	0.5410	29.3
8	13:24	4.80	0.6	0.600	0.6	0.240	2.1404	1.00	2.1404	0.240	0.5137	27.8
9	13:25	5.20	0.6	0.650	0.6	0.260	2.1283	1.00	2.1283	0.260	0.5532	29.9
10	13:27	5.60	0.6	0.300	0.6	0.120	0.3248	1.00	0.3248	0.120	0.0390	2.1
11	13:29	6.00	0.6	0.400	0.6	0.160	-0.1670	1.00	-0.1670	0.160	-0.0267	-1.4
12	13:31	6.40	0.6	0.400	0.6	0.160	-0.1699	1.00	-0.1699	0.140	-0.0238	-1.3
13	13:31	6.70	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0

Rows in italics indicate a QC warning. See the Quality Control page of this report for more information.

Discharge Measurement Summary

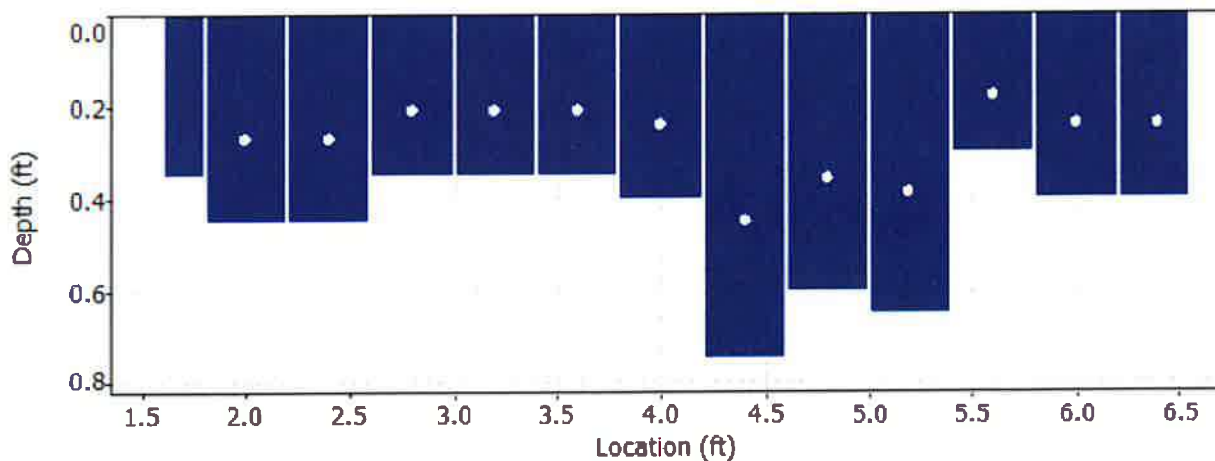
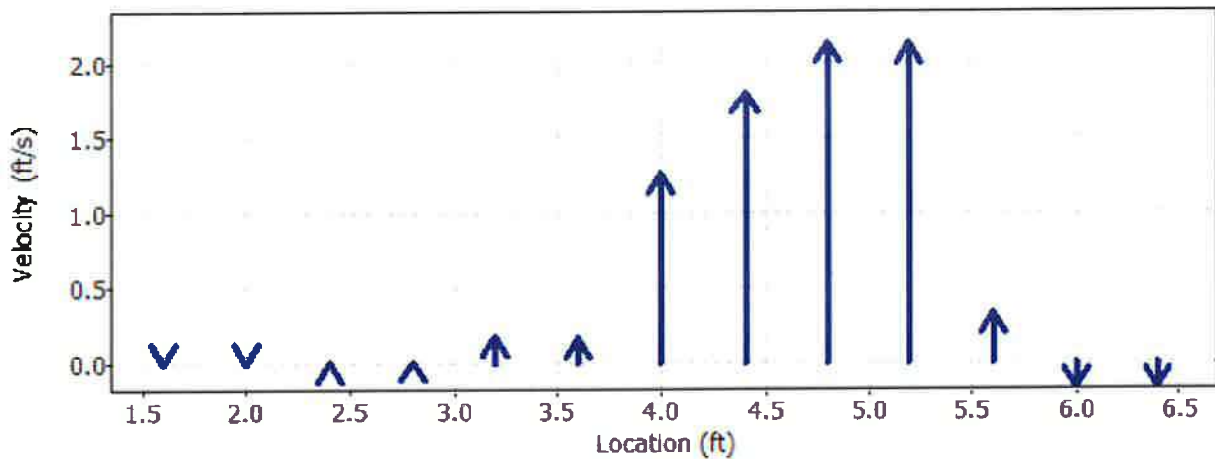
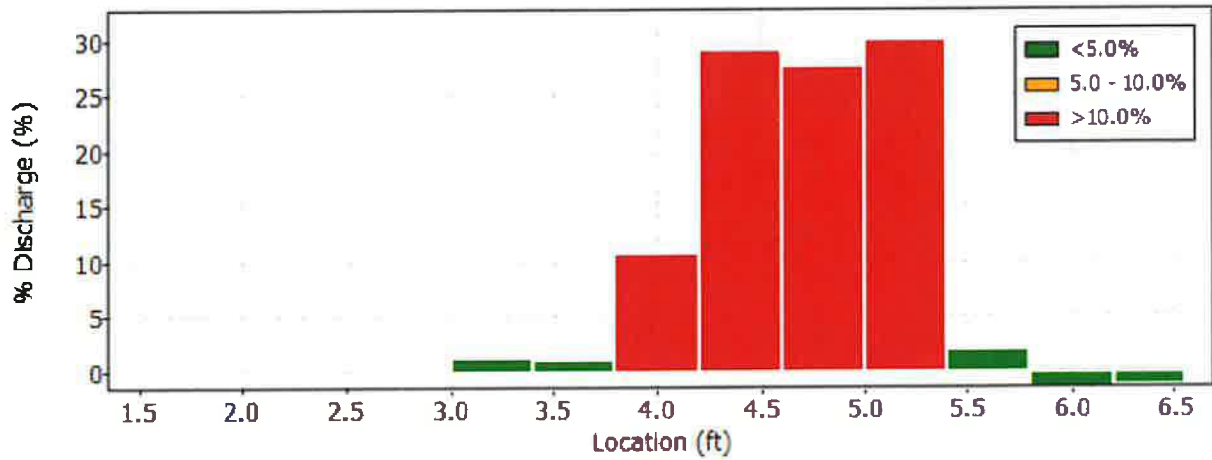
Date Generated: Fri Jun 7 2019

File Information

File Name ALEX.WAD
Start Date and Time 2019/06/06 13:06:16

Site Details

Site Name
Operator(s) DO



Discharge Measurement Summary

Date Generated: Fri Jun 7 2019

File Information

File Name ALEX.WAD
Start Date and Time 2019/06/06 13:06:16

Site Details

Site Name
Operator(s) DO

Quality Control

St	Loc	%Dep	Message
1	2.00	0.6	High differences in beam SNR: 49.4,65.3
3	2.80	0.6	High SNR variation during measurement: 4.7,5.2
4	3.20	0.6	High SNR variation during measurement: 2.1,6.5
5	3.60	0.6	High standard error: 0.033
6	4.00	0.6	Boundary QC is Good; possible boundary interference
10	5.60	0.6	High standard error: 0.050
11	6.00	0.6	High angle: 165
12	6.40	0.6	High angle: 156

Discharge Measurement Summary

Date Generated: Fri Jun 7 2019

File Information

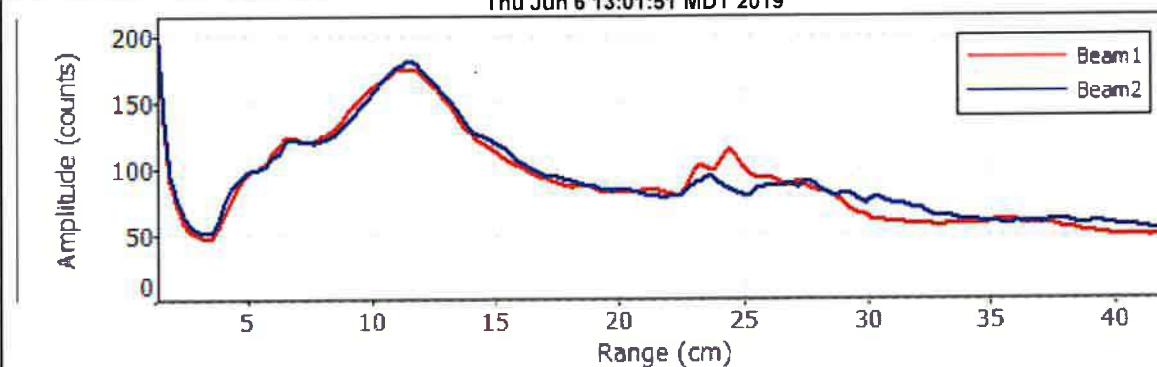
File Name ALEX.WAD
Start Date and Time 2019/06/06 13:06:16

Site Details

Site Name
Operator(s) DO

Automatic Quality Control Test (BeamCheck)

Thu Jun 6 13:01:51 MDT 2019



- ✓ Noise level check - Pass
- ✓ SNR check - Pass
- ✓ Peak location check - Pass
- ✓ Peak shape check - Pass

THEORETICAL HORSEPOWER EQUATION WORKSHEET (cjh 1/92)

Water Right No.: 55-13896
 Reviewer: Alex Dalglish
 Date of Review: 6/12/2019

P/D No.:

PUMP HORSEPOWER
 BOOSTER HORSEPOWER

PUMPING LEVEL

DISCHARGE PRESSURE

RATE OF FLOW (cfs)

Pump #1
40
0
10
60
0.83
372

Well #2
0
0
0
0
#DIV/0!
#DIV/0!

Well #3
0
0
0
0
#DIV/0!
#DIV/0!

The above calculates the formula =

$$Q = \frac{8.8 * (\text{Efficiency}) * \text{hp}}{\text{depth to water} + 2.31 * (\text{psi}) + \text{friction}}$$

Assumptions: %70 efficiency.
 No Friction

Examiners Notes:

The pump for this system is 1 - 61 Hp pump. The calculations below show that a lift of 10 feet would provide 372 gpm from the 1 - 61 Hp pump. The current pump is powered by diesel so it is assumed that it has a lower rate of efficiency. An efficiency rate of 35% was used in the calculation.

PHOTOGRAPHER AND DATE OF PHOTOS: ALEX DALGLEISH-6/6/19

FILE NUMBER 55-13896



Above left photo shows large pond and domestic structures. Right photo shows view of low lying area/ponds from road driving into property. S.F. Owyhee River in background.



These trees correspond to the same trees pointed out in the above left photo. The indicated trees provide perspective on the wildlife POU.

The above photo is looking North at wildlife area. Photo taken between middle and western most culvert.

PHOTOGRAPHER AND DATE OF PHOTOS: ALEX DALGLEISH-6/6/19

FILE NUMBER 55-13896



The above left photo shows the large pond. It was taken looking south and the structures are out of the photo to the right. The right photo is looking South at the 12" culvert/pipe diverting water from the large pond, which feeds into the ditch.



The above left photo is looking at culvert as large pond water flows into it. Pond water flows from this culvert out to a ditch. Above right photo is looking north at discharge from culvert that flows into ditch.



The above left photo shows pond water entering the middle culvert, looking south. Right photo shows water from the large pond flowing into the third and most western culvert.



Left photo is looking North at outlet of the third 12" culvert from large pond. Center photo is the Honda GX 1600 pump near the pond. Residence and lawn are behind this photo. The right photo is the beginning of the ditch flowing out of 24" pipe from diversion dam, looking north.

PHOTOGRAPHER AND DATE OF PHOTOS: ALEX DALGLEISH-6/6/19

FILE NUMBER 55-13896



Above left photo shows pump location on the South Fork Owyhee River. The right photo is looking east at the pressure tank, pump hose with screen and valve in the middle. The river is behind the photo.



Above left photo is looking east at riser location. The right photo is a close up of a riser that is connected to the underground mainline. The river is located behind the photo.



Sprinkler gun on west side of airstrip.

PHOTOGRAPHER AND DATE OF PHOTOS: ALEX DALGLEISH-6/6/19

FILE NUMBER 55-13896



Above left photo is looking SE at control valve near diversion dam. The right photo is the location of headgate. It is underwater in this photo, but it is between the rock and the right edge of photo.



Looking east at diversion dam, which is under water.