

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 85-15802

Exam Date: 06/26/2023

1. Current Owner:

DARREL NEWMAN 259 COTTONWOOD CREEK RD STITES ID 83552-5096

3. **SOURCE:**

GROUND WATER

Method of Determination: Well construction log, photographs, field observation

B. OVERLAP REVIEW

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

NO Overlap

Water Right No.	Source	Purpose of Use	Basis
N/A			

Comments: No overlapping POU

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

NO Overlap

Water Right No.	Source	Purpose of Use	Basis
85-11396	Ground Water	Domestic/Stockwater	Decreed

Comments: 85-11396 and 85-15802 are diverted from the same well

C. DIVERSION AND DELIVERY SYSTEM1. **LOCATION OF POINT(S) OF DIVERSION:**

GROUND WATER NE¼ NE¼, Sec. 30, Twp 32N, Rge 04E, B.M. IDAHO County

Method of Determination: GPS (See attached photographs)

PLACE OF USE: IRRIGATION

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
32N	04E	30	4.6	6.4	4.1	17.0	0.4												32.5

Total Acres: 32.5

Method of Determination: GIS and aerial imagery, field observation

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
993231	n/a	10	n/a	n/a	n/a

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
N/A						

2. Measurements: Flow measurements were not possible due to pipe diameter. Theoretical flow measurements given below.

E. FLOW CALCULATIONS☒ Additional Computation Sheets Attached

Measured Method: see attachments

Theoretical flow: 0.17 cfs

Permitted flow: 0.20 cfs

Recommended flow rate: 0.17 cfs

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation:

$$V_{IR} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 32.5 \text{ acres} \times 3 \text{ acre-ft/acre} = 97.5 \text{ acre-ft}$$

$$V_{DR} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = 0.171 \text{ cfs} \times 246 \text{ days} \times 1.9835 = 83.4 \text{ acre-ft}$$

$$V = \text{Smaller of } V_{IR} \text{ and } V_{DR} = 83.4 \text{ acre-ft}$$

2. Volume Calculations for Other Uses: N/A

G. NARRATIVE/REMARKS/COMMENTS

Darrel Newman submitted proof of beneficial use on December 19, 2022 after Permit 85-15802 lapsed on December 1, 2022. The permit was reinstated in 2023 and the priority date was advanced to September 9, 2019. A Field Examination for Water Right Permit 85-15802 was conducted June 26, 2023 by Blake Burkard and Justin Shearer. We met with Darrel Newman, the permit holder, and gathered information about his irrigation system (see diagram). Newman uses a 145' deep well, drilled 2006, with a 10 HP pump likely set between 105' and 120' below ground surface. The static water level when the well was drilled was 30' as reported by the driller.

The POD was confirmed to be in NE¼ NE¼, Sec. 30, Twp 32N, Rge 04E by visiting the site of the well and recording GPS data there. A flow measurement was not achievable in the field due to a lack of exposed piping on the mainline. Two theoretical flow rates were calculated. The attached flow calculations demonstrates that the diversion system is capable of conveying the permitted 0.20 cfs. However, using the *Sprinkler Nozzle Flow Rate Calculator* developed by Mathew Weaver (2012) for Department use, the conveyance system is only capable of irrigating the place of use at a rate of 0.17 cfs given the number of sprinklers and estimated operating pressure. I recommend reducing the rate from 0.20 cfs to 0.17 cfs for licensing.

Newman was permitted water use for the irrigation of 37 acres. GIS and taxlot data confirms that Newman owns both the POU and POD. Using satellite imagery from years 2021, 2019, and 2017, and confirming the acreage via field examination, it is apparent that Newman is only irrigating 32.5 acres. Each QQ within the irrigation POU had acreage trimmed (compare permit proof report to license proof report for specifics). I recommend trimming the acreage of irrigation to 32.5 acres. An annual volume was calculated using the standard season of use for Stites, Idaho. I am recommending a volume of 83.4 acre-ft per year, the smaller of the two volume calculations. Newman mentioned during the exam that his actual season of use is typically shorter, but a bad drought could change his irrigation methods.

Conditions 26A and 046 were standard conditions for groundwater permits in 2019, when Newman filed an application. I am recommending removing these conditions as the well has been constructed to Idaho Code. Condition 004 was placed on the permit, but I am recommending its removal as the POD is located within 50 ft of the domestic structure and I do not believe right-of-way will be an issue. Condition 01M is a standard condition on irrigation rights not belonging to water districts and should remain on the license. R62 detailing standard headgate volumes per acre should also remain on the license. No additional overlap conditions are recommended since the flow calculation sheet demonstrates that the POD is capable of producing flows for both 85-15802 and 85-11396 simultaneously.

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>Annual Volume</u>
IRRIGATION	03/15 to 11/15	0.17 CFS	83.4 AF

Totals: 0.17 CFS 83.4 AF

2. Recommended Amendments

____ Change P.D. as reflected above ____ Add P.D. as reflected above X None

____ Change P.U. as reflected above ____ Add P.U. as reflected above X None

I. AUTHENTICATION Blake Burkard -

Field Examiner

[Signature]

Date

3/7/25

Reviewer

P. Burkard

Date

3/7/25



Figure 1: Place of Use. Alfalfa hay as seen from domestic property fence line

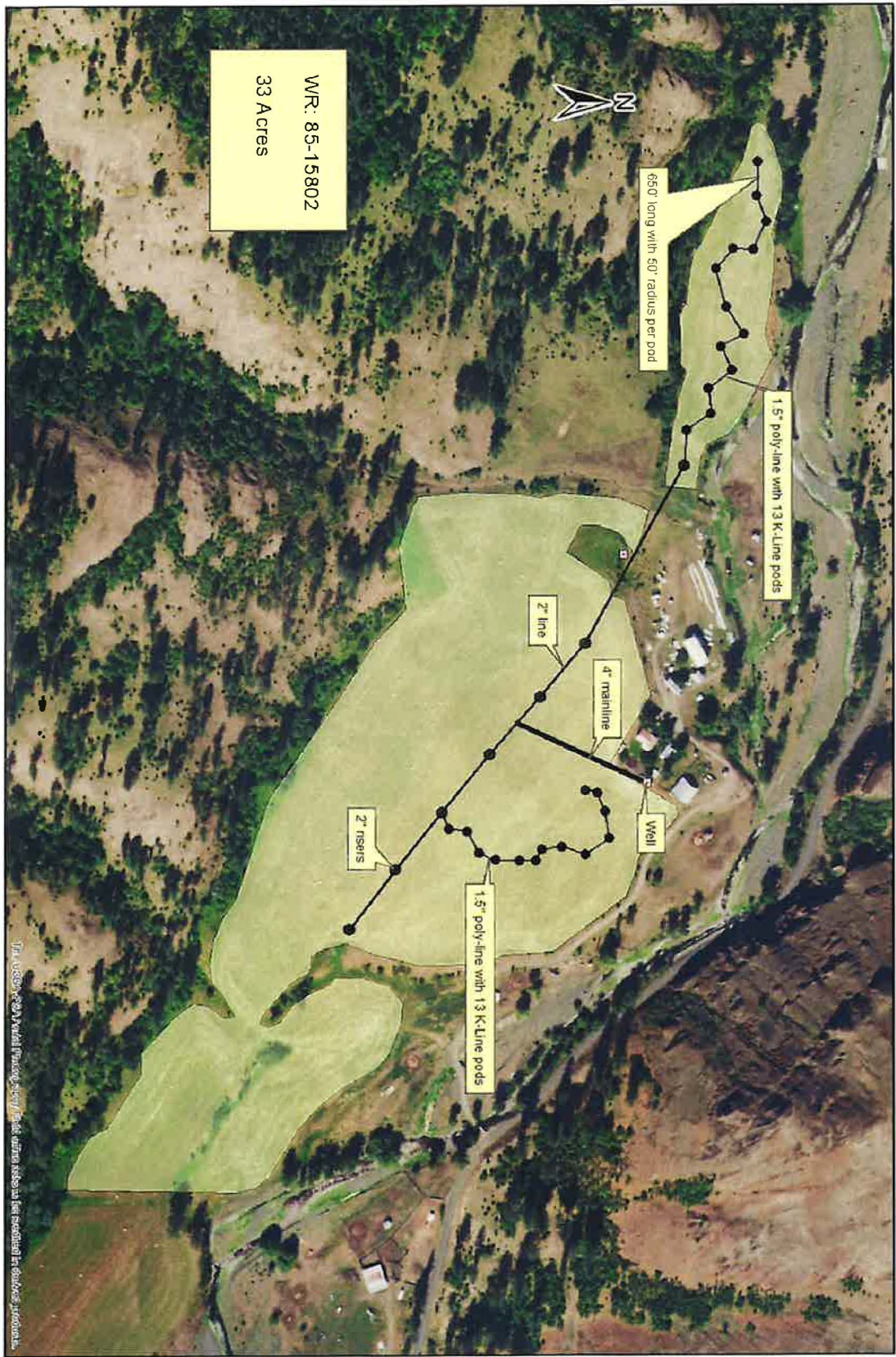


Figure 2: System Diagram

FLOW CALCULATION

PERMITTED FLOW (CFS):	0.2
(GPM):	89.772

TOTAL DYNAMIC HEAD	
Elevation of water surface (ft):	1417
Elevation of highest sprinkler location (ft):	1520
STATIC HEAD (ft):	103
Sprinkler Pressure (psi):	50
PRESSURE HEAD (ft):	115.5
Linear distance between pump and furthest sprinkler head (ft):	1800
Assume friction loss: (psi/100 ft)	0.8
FRICTION HEAD (ft):	14.4
SUM (ft):	232.9

EFFICIENCY(%):	70
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BRAKE HORSEPOWER (PUMP):	7.54
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REARRANGE FOR FLOW:	
Pump HP:	10

Q (cfs):	0.265
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Flow calculations demonstrate that any pump greater than 8 HP can produce the permitted flow rate under the given conditions. Google Earth was used to trace the longest path water would flow. Elevations taken from highest irrigated lands and well location, subtracting static water level from well construction log.

Rearranging the equation, entering in the actual well pump horsepower, the system is likely capable of diverting water for irrigation and domestic use simultaneously (0.265 cfs – 0.04 cfs = 0.225 cfs)

Sprinkler Nozzle Flow Rate Calculator

[READ ME](#)

Step 1 - Specify 1st Nozzle Type Configuration

Select Sprinkler Coefficient, C

☒ User Defined ☐ Theoretical Maximum

Input C Value:

1

Input Nozzle Pressure:

50

psi

Input Nozzle Diameter:

3.0000

mm

Input Number of Type 1 Sprinkler Nozzles:

26

Step 2 - Specify 2nd Nozzle Type Configuration

Select Sprinkler Coefficient, C

☐ User Defined ☒ Theoretical Maximum

Input Nozzle Pressure:

psi

Input Nozzle Diameter:

in

Input Number of Type 2 Sprinkler Nozzles:

Step 3 - Specify 3rd Nozzle Type Configuration

Select Sprinkler Coefficient, C

☐ User Defined ☒ Theoretical Maximum

Input Nozzle Pressure:

psi

Input Nozzle Diameter:

in

Input Number of Type 3 Sprinkler Nozzles:

Flow Rate Summary

Type 1 Nozzle(s): 0.171

Type 2 Nozzle(s): 0.000

Type 3 Nozzle(s): 0.000

Combined: 0.171

cfs

Nozzle flow rate calculator appears to be the limiting factor of the irrigation system capacity. Pressure would have to be 70 psi to create a flow rate of 0.20 cfs, which is above the designed operating pressure for K-Line 5022 sprinklers. 50 PSI is the estimated operating pressure; at the field exam, Newman stated that the diameter of a single sprinkler is 50 ft.

Nozzle Options for NAAN 5022 & PC by NAAN

*Application rates for nozzle options are approximate and based on supplied pressure of 45 PSI, 0% ground slope, and 2,025 sq. ft. of coverage per sprinkler (45 ft. x 45 ft. spacing).

<u>Order Code</u>	<u>Color</u>	<u>Orifice Size</u>	<u>Application Rate per 24 Hours</u>
P	Purple	2.4 mm / 3/32"	2.19"
O	Orange	2.8 mm / 7/64"	2.80"
R	Red	3.0 mm / 15/128"	3.20"
G	Green	3.2 mm / 1/8"	3.58"
BU	Blue	3.6 mm / 9/64"	4.03"
BK	Black	4.0 mm / 5/32"	5.30"
BL	*Blank*	No Nozzle / Open Orifice	Not Applicable

Figure 3: Nozzle diameter and color correspondence

Permit holder had red nozzles on each pod (3.0 mm) (See attachments)



Figure 4: Piping for domestic and irrigation systems next to well



Figure 5: Well GPS Location



Figure 6: 1 of 26 KLine Pods used for irrigation



Figure 7: KLine 5022 Sprinkler with 3.00 mm nozzle