

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 15-7275

Exam Date: 9/8/2023

1. Current Owner:

M J DAVIS MEMORIAL LTD PARTNERSHIP
1970 LA BELLEZZA GROVE
COLORADO SPRINGS CO 80919

2. Accompanied by: Luke Waldron

Phone No: 208-380-3522

Relationship to permit Holder: Renter for the MJ Davis property.

3. **SOURCE:**

UNNAMED STREAM

Tributary

SAMARIA CREEK

Explanation of Source: The source listed on Permit 15-7275 was Thomas Davis Springs. The permit, however, listed five points of diversion located along a two-mile stretch of the creek channel in Thomas Davis Canyon. Thomas Davis Springs is a named hydrologic feature shown on the USGS topographic map. The springs are located entirely on BLM ground. Water from Thomas Davis Springs forms a flowing stream that runs through the bottom of Thomas Davis Canyon and eventually flows into Samaria Creek. The stream flowing through Thomas Davis Canyon is not named. Water right 15-7275 is diverted from the creek channel just downstream of the boundary between the BLM property and the MJ Davis property. Only one point of diversion was developed under Permit 15-7275. The point of diversion is from the creek channel, not directly from Thomas Davis Springs. Therefore, the source is more properly identified as Unnamed Stream tributary to Samaria Creek.

B. OVERLAP REVIEW

1. Place of Use: None.

2. Point of Diversion: Samaria Water & Irrigation Company (SWIC) holds water right 15-4066, which is a statutory claim authorizing the diversion of 3.00 from Thomas Davis Springs for irrigation use. The point of diversion is along the unnamed stream in Thomas Davis Canyon. SWIC has not diverted water right 15-4066 for many years and does not actively maintain the ditch through Thomas Davis Canyon. In most years, the flow is not sufficient to overcome the losses in the creek channel and the canyon ditch for the water to make it to SWIC's main canal. During the summer, the entire flow of the creek is diverted through the MJ Davis pipeline. Water is released from the pipeline into the old SWIC ditch close to Samaria Creek. SWIC benefits from the overflow from the MJ Davis pipeline because it helps SWIC avoid all the losses in the canyon. There is no agreement for MJ Davis to convey water for SWIC. Further, the MJ Davis diversion is not an authorized point of diversion for water right 15-4066. MJ Davis pipeline also conveys water for stockwater use. Currently this stockwater use is an unrecorded water right which will be claimed as a beneficial use right in the Bear River Basin Adjudication.

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

UNNAMED STREAM NW¼ NW¼, Sec. 34, Twp 15S, Rge 35E, B.M. ONEIDA County

Method of Determination: Site visit. Infrastructure visible in aerial imagery.

2. PLACES OF USE**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	
15S	35E	22	7.5		19.0	16.0													42.5
15S	35E	27									8.5	6.9	2.7						18.1
15S	35E	34						1.9											1.9

Total Acres: 62.5

PLACE OF USE: FIRE PROTECTION

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
15S	35E	27									X	X	X						
15S	35E	34						X											

Method of Determination: Site visit. Detailed review of aerial images 2005-2017.

3. DELIVERY SYSTEM

A diversion dam on the creek routes water into a pipeline. Water is conveyed in a pipeline for about 100 feet then through a vertical overflow device equipped with a mesh screen to filter out gravel and debris. Water is captured in a small storage tank (vertical culvert section). Two pipelines extend out of tank. One pipeline runs to the small irrigation areas in Thomas Davis Canyon within 1/2 mile of the point of diversion. The other pipeline, the main pipeline, conveys water to the primary irrigated acres in Section 22. Because of the significant elevation change between the point of diversion and place of use, the main pipeline was constructed with multiple pressure breaks along its length. Pipeline delivers water to wheel lines for sprinkler irrigation. Because of the high pressure in the system, sprinklers are equipped with ¼ inch nozzles. Overflow from the pipeline system flows into a ditch that flood irrigates a small area in the NENE of Section 34.

D. FLOW MEASUREMENTS

Field exam was conducted in September, when the flow of the creek was at its low point for the year. The observed flow was less than the 1.00 cfs authorized by Permit 15-7275. Mr. Waldron confirmed that the diversion and pipeline can capture the full flow of the creek at the point of diversion, even at high flow. Mr. Waldron said the flow in early summer 2023 was the highest he has ever observed and exceeded 1.00 cfs. This is consistent with the record setting snowpack for southeast Idaho in the winter of 2022-2023. Despite the high flows, the diversion and pipeline still captured the full flow of the creek.

E. FLOW CALCULATIONS

Two 1/8 mile wheel lines are moved around on the property to irrigate the larger fields in Section 22. The two wheel lines are visible in aerial imagery. Each wheel line contains up to 18 rainbirds. At maximum flow, there is enough pressure to operate two wheel lines at the same time. For example, in the 2017 aerial image, which was also a good snowpack year, the two 1/8 mile wheel lines are operating at the same time. 36 sprinklers with 1/4 inch nozzles, even at moderate pressure, are sufficient to use more than the 1.00 cfs authorized by Permit 15-7275. These high flow rates are only realized for short periods during the early summer on high snowpack years. In drought years and in the late summer, the flow rate of the creek is less than 1.00 cfs.

Application for Permit 15-7275 was protested by SWIC and the Department conducted a hearing to decide the contested case. As part of the final order of the Department, approving Permit 15-7275, the hearing officer found that the evidence in the administrative record supported the SWIC statutory claim from Thomas Davis Springs, with a diversion rate of 3.00 cfs. This is further confirmation that the permitted diversion rate for water right 15-7275, 1.00 cfs, can be captured and used through the MJ Davis pipeline when the flow is available. USGS Stream Stats also indicates that the flow in Thomas Davis Canyon in May and June can exceed 3.00 cfs.

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation:

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 62.5 \text{ acres} \times 3.5 \text{ af/acre} = 219 \text{ acre-feet}$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = 1.00 \times 214 \times 1.9835 = 424 \text{ acre-feet}$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = 219 \text{ acre-feet}$$

2. Volume Calculations for Other Uses: No volume will be calculated or assigned for fire protection. Instead, the license will include a condition limiting the diversion for fire protection to fight or repel an existing fire.

G. NARRATIVE/REMARKS/COMMENTS

Application for Permit 15-7275 was filed in response to an enforcement action. Jeff Davis (MJ Davis Memorial Limited Partnership) had been diverting water from Thomas Davis Springs (creek) to establish trees along the riparian area of Thomas Davis Canyon. The irrigation was occurring through above-ground black poly pipe. Permit 15-7275 was approved by the Department in May 2007, after a contested case hearing. Jeff Davis and Luke Waldron continued to irrigate the canyon trees through pipelines and drip lines while the main pipeline was constructed. The canyon areas benefitting from irrigation are clearly visible in 2011 aerial imagery. The main pipeline supply water to the acres in Section 22 was completed prior to 2011.

On August 31, 2012, Jeff Davis passed away. The trees and canyon areas were no longer irrigated after Jeff's passing. In August 2013, a wildfire burned through the canyons above Samaria and killed all the trees that had been established in the Thomas Davis Canyon. The burnt area is visible in the 2012 aerial imagery. The fire also damaged and melted much of the black poly pipe used to irrigate the canyon area. I observed black poly pipe stretched across the ground throughout the canyon area.

In addition to the canyon tree irrigation (which covers approximately eight acres), Jeff Davis cultivated a small field, covering approximately twelve acres in the NESW and NWSW of Section 27. The main pipeline runs through the middle of the field and risers were installed to allow for irrigation. Mr. Waldron said the small field was irrigated in 2011, 2012 and 2013 to grow barley, but has not been irrigated since 2013.

Have conditions of permit approval been met? X 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	04/01 to 10/31	1.00 CFS	219.0 AF
FIRE PROTECTION	06/01 to 11/01	1.00 CFS	
<u>Totals:</u>		1.00 CFS	219.0 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

Field Examiner's Name James Cefalo Date 9/26/2023
 Reviewer Blake Sorden Date 9/28/2023

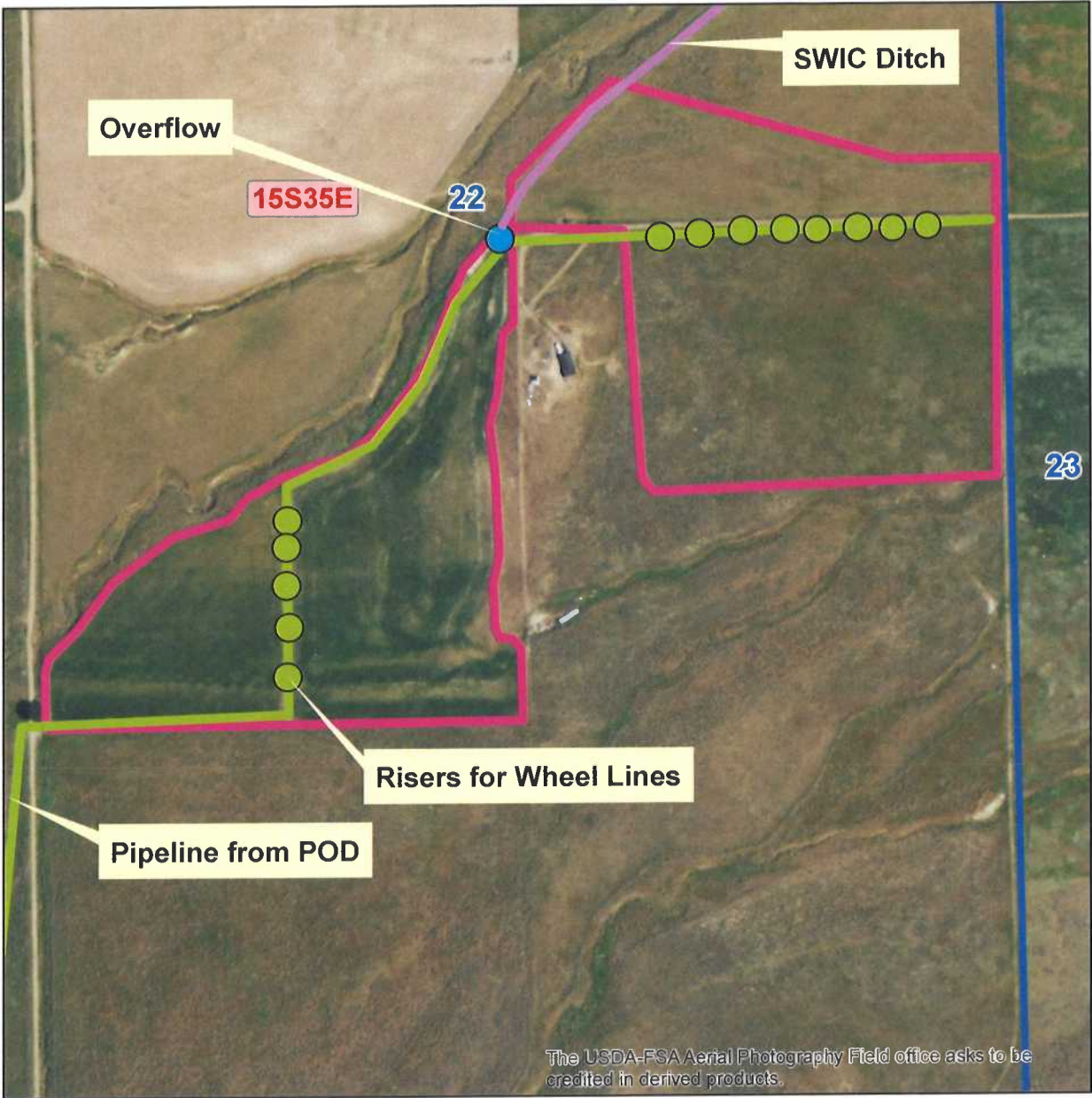


Diversion from Unnamed Stream



Vertical storage tank, debris filter, beginning of small pipeline and main pipeline

Field Exam for Water Right 15-7275



2021 Aerial Imagery

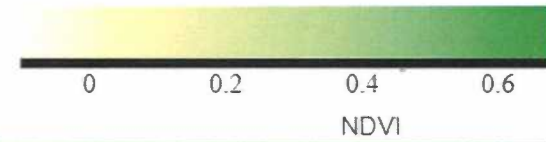
-  15-7275
-  Township/Range
-  Sections

0 300 600 1,200 Feet

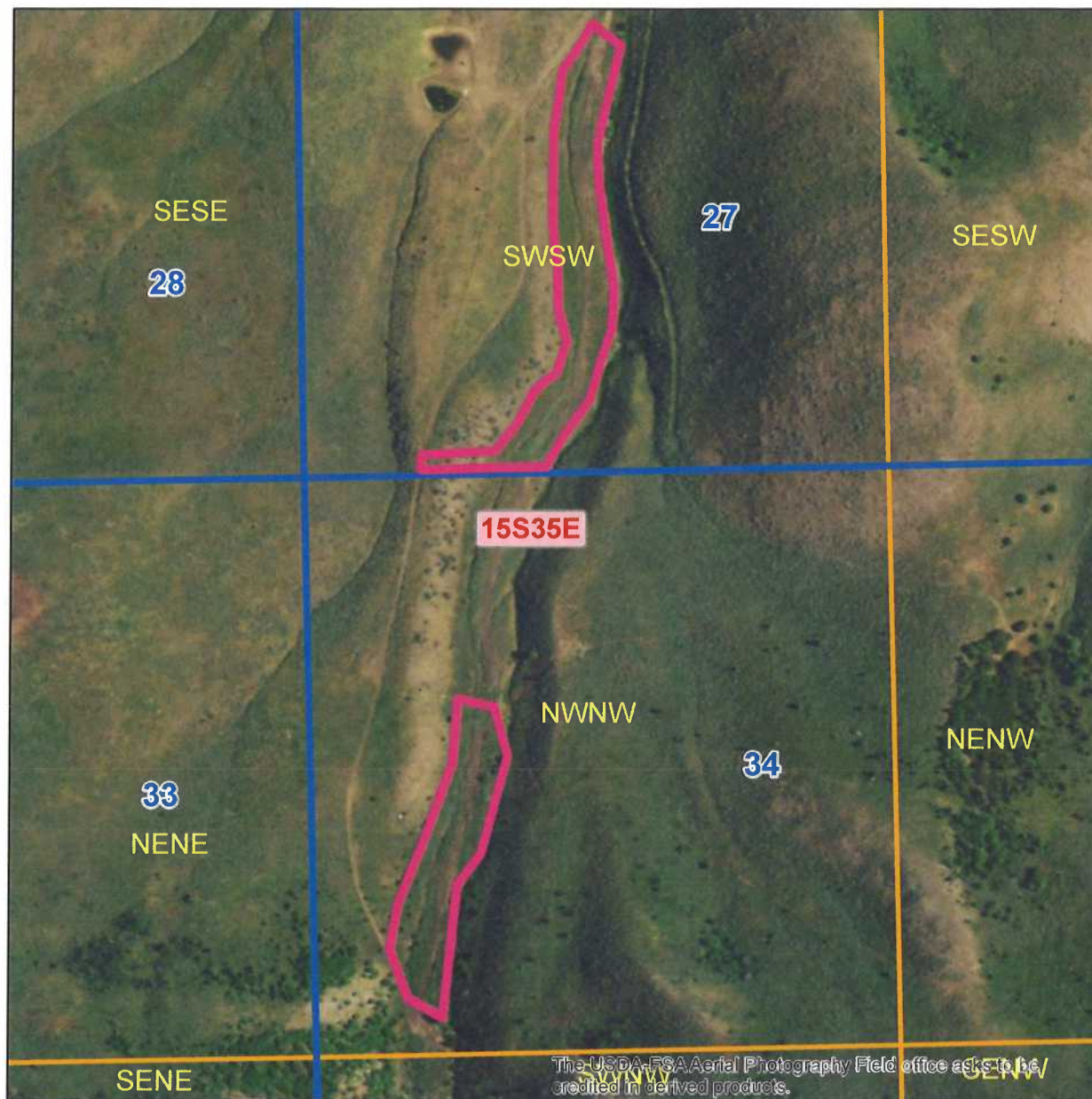


NDVI (Landsat 5/7/8/9 SR)

2017-04-01 to 2017-10-31, Maximum



Water Right 15-7275 Canyon Areas Irrigated prior to 2013



2011 Aerial Imagery

- 15-7275
- Township/Range
- Sections
- QQ

0 250 500 1,000 Feet



6/27/2015

Google Earth

300 ft



7/19/2019

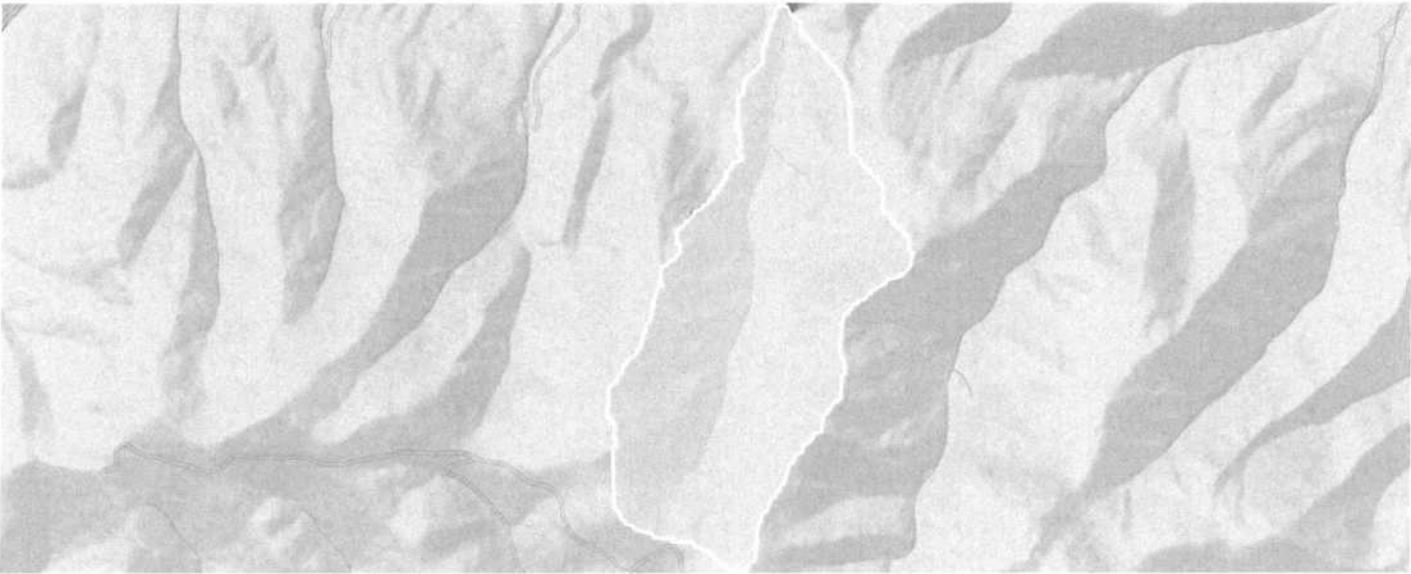


Google Earth

400 ft

StreamStats Report

Region ID: ID
Workspace ID: ID20230921215128315000
Clicked Point (Latitude, Longitude): 42.08402, -112.36276
Time: 2023-09-21 15:51:59 -0600



+ Collapse All

➤ Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLDEM30M	Mean basin slope computed from 30 m DEM	43.3	percent
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	1110	feet per mi
DRNAREA	Area that drains to a point on a stream	0.83	square miles
FOREST	Percentage of area covered by forest	36	percent
MINBELEV	Minimum basin elevation	5450	feet
PRECIP	Mean Annual Precipitation	19.7	inches
SLOP30_30M	Percent area with slopes greater than 30 percent from 30-meter DEM.	75.4	percent

➤ Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Flow Region 7 2016 5083]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.83	square miles	0.15	1400
MINBELEV	Minimum Basin Elevation	5450	feet	2230	7020

Peak-Flow Statistics Flow Report [Peak Flow Region 7 2016 5083]

Pll: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEP: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	Pll	Plu	ASEp
80-percent AEP flood	9.37	ft ³ /s	2.7	32.5	66.9
66.7-percent AEP flood	13	ft ³ /s	3.99	42.3	63.7
50-percent AEP flood	18.6	ft ³ /s	6	57.6	61.3
42.9-percent AEP flood	21.4	ft ³ /s	6.96	65.8	61.1
20-percent AEP flood	35.9	ft ³ /s	11.8	110	61.7
10-percent AEP flood	49.3	ft ³ /s	15.8	154	63.8
4-percent AEP flood	69.1	ft ³ /s	20.9	229	68.1
2-percent AEP flood	83.2	ft ³ /s	24.1	288	71.5
1-percent AEP flood	98.8	ft ³ /s	27.2	359	75.1
0.5-percent AEP flood	114	ft ³ /s	29.9	435	78.8
0.2-percent AEP flood	138	ft ³ /s	33.8	564	84

Peak-Flow Statistics Citations

Wood, M.S., Fosness, R.L., Skinner, K.D., and Veilleux, A.G., 2016, Estimating peak-flow frequency statistics for selected gaged and ungaged sites in naturally flowing streams and rivers in Idaho: U.S. Geological Survey Scientific Investigations Report 2016-5083, 56 p. (<http://dx.doi.org/10.3133/sir20165083>)

➤ Annual Flow Statistics

Annual Flow Statistics Parameters [Monthly Annual Region 7 2001 4093]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.83	square miles	7.4	535.3
FOREST	Percent Forest	36	percent	0	38.9
SLOP30_30M	Slopes gt 30pct from 30m DEM	75.4	percent	0	55.2
BSLDEM30M	Mean Basin Slope from 30m DEM	43.3	percent	1.7	35.3

Annual Flow Statistics Disclaimers [Monthly Annual Region 7 2001 4093]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Annual Flow Statistics Flow Report [Monthly Annual Region 7 2001 4093]

Statistic	Value	Unit
Mean Annual Flow	0.941	ft ³ /s

Annual Flow Statistics Citations

Hortness, J.E., and Berenbrock, Charles, 2001, Estimating Monthly and Annual Streamflow Statistics at Ungaged Sites in Idaho: U.S. Geological Survey Water-Resources Investigations Report 01-4093, 36 p. (<https://pubs.er.usgs.gov/publication/wri014093>)

➤ April Flow-Duration Statistics

April Flow-Duration Statistics Parameters [Monthly Annual Region 7 2001 4093]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
CSL10_85	Stream Slope 10 and 85 Method	1110	feet per mi	18.4	372.8
FOREST	Percent Forest	36	percent	0	38.9
SLOP30_30M	Slopes gt 30pct from 30m DEM	75.4	percent	0	55.2
BSLDDEM30M	Mean Basin Slope from 30m DEM	43.3	percent	1.7	35.3

April Flow-Duration Statistics Disclaimers [Monthly Annual Region 7 2001 4093]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

April Flow-Duration Statistics Flow Report [Monthly Annual Region 7 2001 4093]

Statistic	Value	Unit
April 20 Percent Duration	8.4	ft ³ /s
April 50 Percent Duration	5.74	ft ³ /s
April 80 Percent Duration	3.11	ft ³ /s

April Flow-Duration Statistics Citations

Hortness, J.E., and Berenbrock, Charles, 2001, Estimating Monthly and Annual Streamflow Statistics at Ungaged Sites in Idaho: U.S. Geological Survey Water-Resources Investigations Report 01-4093, 36 p.
(<https://pubs.er.usgs.gov/publication/wri014093>)

➤ May Flow-Duration Statistics

May Flow-Duration Statistics Parameters [Monthly Annual Region 7 2001 4093]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
CSL10_85	Stream Slope 10 and 85 Method	1110	feet per mi	18.4	372.8
FOREST	Percent Forest	36	percent	0	38.9
PRECIP	Mean Annual Precipitation	19.7	inches	8.2	29.1

May Flow-Duration Statistics Disclaimers [Monthly Annual Region 7 2001 4093]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

May Flow-Duration Statistics Flow Report [Monthly Annual Region 7 2001 4093]

Statistic	Value	Unit
May 20 Percent Duration	8.87	ft ³ /s
May 50 Percent Duration	5.14	ft ³ /s
May 80 Percent Duration	2.19	ft ³ /s

May Flow-Duration Statistics Citations

Hortness, J.E., and Berenbrock, Charles, 2001, Estimating Monthly and Annual Streamflow Statistics at Ungaged Sites in Idaho: U.S. Geological Survey Water-Resources Investigations Report 01-4093, 36 p.
(<https://pubs.er.usgs.gov/publication/wri014093>)

➤ June Flow-Duration Statistics**June Flow-Duration Statistics Parameters [Monthly Annual Region 7 2001 4093]**

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
CSL10_85	Stream Slope 10 and 85 Method	1110	feet per mi	18.4	372.8
FOREST	Percent Forest	36	percent	0	38.9
PRECIP	Mean Annual Precipitation	19.7	inches	8.2	29.1

June Flow-Duration Statistics Disclaimers [Monthly Annual Region 7 2001 4093]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

June Flow-Duration Statistics Flow Report [Monthly Annual Region 7 2001 4093]

Statistic	Value	Unit
June 20 Percent Duration	3.41	ft ³ /s
June 50 Percent Duration	2.27	ft ³ /s
June 80 Percent Duration	1.18	ft ³ /s

June Flow-Duration Statistics Citations

Hortness, J.E., and Berenbrock, Charles, 2001, Estimating Monthly and Annual Streamflow Statistics at Ungaged Sites in Idaho: U.S. Geological Survey Water-Resources Investigations Report 01-4093, 36 p. (<https://pubs.er.usgs.gov/publication/wri014093>)

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Application Version: 4.17.0

StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1

SPRINKLER IRRIGATION— APPLICATION RATES AND DEPTHS

by Thomas W. Ley, Extension Irrigation Engineer, WSU Prosser

Procedure

1. Measure sprinkler pressure (psi) using Pitot gauge. Hold gauge in center of jet no more than 1/8" from nozzle face.
2. Measure sprinkler discharge (gallons per minute) using a 5-gallon bucket, hose, and watch. Sprinkler gpm equals 300 divided by time (seconds) to fill 5-gallon bucket. For 2-nozzle heads, measure both.
3. Record nozzle size(s) and check nozzles for wear by inserting shank end of a new drill bit (same size as nozzle) into operating sprinkler. Observe any leakage or spray (amount and distance). Fine-to-coarse spray up to 10 to 15 feet from head may mean at least 15% nozzle wear or 15% more water being discharged.
4. Repeat steps 1, 2, and 3 for at least 3 sprinklers (beginning, middle, and end) on hand, wheel, and permanent systems to get average for lateral. Do same for center pivot, and record sprinkler number.
5. Measure sprinkler spacing on lateral (ft) and lateral spacing on mainline (ft) for handlines, wheel-lines, and permanent systems. Determine total

area irrigated and design or actual gallons (gpm) for center pivots.

6. Compare measured data (nozzle size, pressure, and gpm) with theoretical data in Table 1. Measured discharge vs discharge in Table 1 (at same nozzle size and pressure) indicates amount of nozzle wear. If nozzles are new and pressure is known, use Table 1 to find discharge of sprinkler. For pivots, compare sprinkler number and measured data with pivot design package to determine if pressures and discharges are correct.

7. Average gross application rates for different sprinkler gpm and spacings are given in Table 2. For other spacings or gpm use:

$$\text{Gross Application Rate (inches/hour)} = \frac{\text{GPM} \times 96.3}{\text{sprinkler spacing} \times \text{lateral spacing}} \quad (\text{or area irrigated, sq ft})$$

Example: 6 gpm heads on 40 x 60 spacing

$$\text{Average Gross Appl Rate} = \frac{6 \times 96.3}{40 \times 60} = 0.24 \text{ in/hr} \quad (\text{or use Table 2})$$

Table 1. Sprinkler discharge gpm (gallons per minute) for nozzle size (inches) and pressures (psi) (pounds per square inch).

psi	Nozzle Size (in)										
	3/32	7/64	1/8	9/64	5/32	11/64	3/16	13/64	7/32	15/64	1/4
20	1.17	1.60	2.09	2.65	3.26	3.92	4.69	5.51	6.37	7.32	8.34
25	1.31	1.78	2.34	2.96	3.64	4.38	5.25	6.16	7.13	8.19	9.32
30	1.44	1.95	2.56	3.26	4.01	4.83	5.75	6.80	7.86	8.97	10.21
35	1.55	2.11	2.77	3.50	4.31	5.18	6.21	7.30	8.43	9.69	11.03
40	1.66	2.26	2.96	3.74	4.61	5.54	6.64	7.80	9.02	10.35	11.79
45	1.76	2.39	3.13	3.99	4.91	5.91	7.03	8.30	9.60	10.99	12.50
50	1.85	2.52	3.30	4.18	5.15	6.19	7.41	8.71	10.10	11.58	13.18
55	1.94	2.64	3.46	4.37	5.39	6.48	7.77	9.12	10.50	12.15	13.82
60	2.03	2.76	3.62	4.50	5.65	6.80	8.12	9.56	11.05	12.68	14.44
65	2.11	2.88	3.77	4.76	5.87	7.06	8.45	9.92	11.45	13.21	15.03
70	2.19	2.99	3.91	4.96	6.10	7.34	8.78	10.32	11.95	13.70	15.59
75	2.27	3.09	4.05	5.12	6.30	7.58	9.08	10.66	12.32	14.19	16.14
80	2.35	3.19	4.18	5.29	6.52	7.84	9.39	11.02	12.74	14.64	16.67
85	2.42	3.29	4.31	5.45	6.71	8.07	9.67	11.35	13.11	15.10	17.18
90	2.49	3.38	4.43	5.61	6.91	8.31	9.95	11.69	13.51	15.53	17.68
100	2.62	3.57	4.67	5.91	7.29	8.76	10.50	12.32	14.23	16.37	18.64
110	2.75	3.74	4.89	6.19	7.63	9.24	11.00	12.90	14.97	17.17	19.55
120	2.87	3.91	5.10	6.46	7.97	9.65	11.48	13.47	15.63	17.93	20.42
130	2.99	4.07	5.31	6.72	8.30	10.04	11.95	14.02	16.27	18.66	21.25

Note: Figures given are approximate maximum discharge rates for given nozzle size and pressure.