MONTANA DNRC

DNRC - 2025

WATER COMMISSIONER TRAINING

WELCOME

Agenda

Introductions

Distribution
vs.
Enforcement

New 2025 Manual
&
Bonus Materials

Let’s Break the Ice!

- ❑ Name
- ❑ Role
- ❑ Years of experience
- ❑ What do you want to learn?

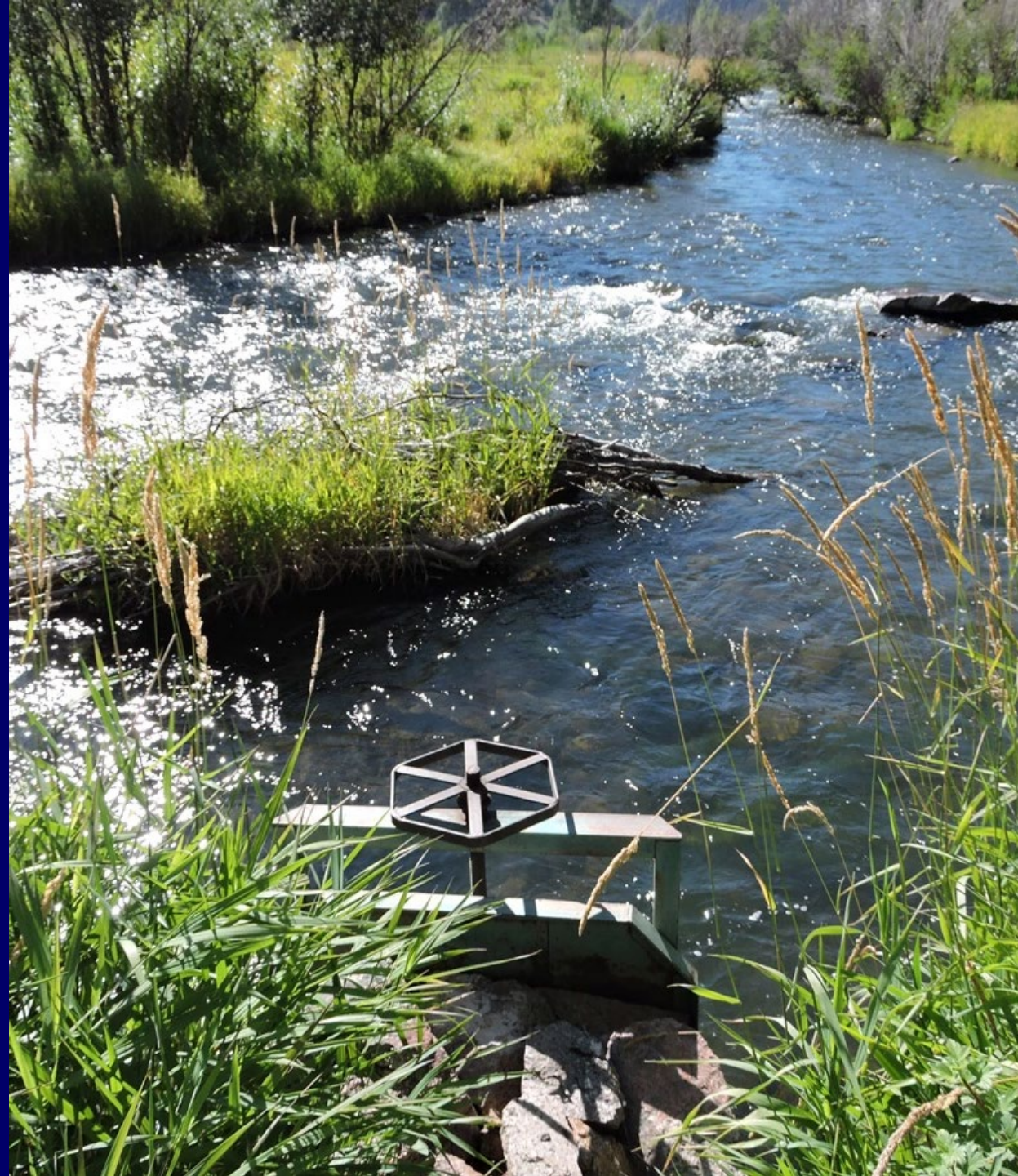
DISTRIBUTION OVERVIEW

Big Hole Headgate – WSB DNRC

DISTRIBUTION OVERVIEW

WHAT DISTRIBUTION IS

- Distribution is the physical allocation of water to points of diversion on valid water rights
- Distribution is NOT enforcement:
  - Enforcement is non-compliance
  - Example:
    - Commissioners distribute water in a distribution project:
    - DNRC investigates illegal water use complaint. DNRC takes action to enforce non-compliance.



DISTRIBUTION OVERVIEW

CREATION OF A DISTRIBUTION PROJECT

Water Users Experience Challenges

Water users request Distribution Project & Commissioner by petitioning District Court.

District Court Evaluates Petition

For representation of 15% of the flow rate or water users.

For other details, such as Commissioner and compensation

District Court Issues

An Order Appointing a Water Commissioner.

A Request for Tabulation of Water Rights from Water Court.

Creation of Distribution Project

WC forwards Request to DNRC; DNRC creates tabulations for distribution projects.

DISTRIBUTION OVERVIEW

PETITION

Petition starts distribution project process:

- ❑ Petition directs scope of project
- ❑ 15% of water users or 15% flow rate must be represented on the petition
- ❑ Judge must appoint a Commissioner if 15% is met. Can appoint a Commissioner if it is not
- ❑ Petition can request a specific person or people as Commissioners
- ❑ Petition can request a certain wage for Commissioners
- ❑ All water users represented by the petition must comply, not just those that signed

DISTRIBUTION OVERVIEW

PETITION TEMPLATE

PETITION TO ENFORCE WATER COURT DECREE AND APPOINT WATER COMMISSIONER

This petition is brought under Sections 3-7-212, 85-2-406(4), and 85-5-101, MCA. The holders of at least fifteen percent (15%) of the water rights on _____Creek petition the District Court for an order to enforce the _____ Decree issued by the Montana Water Court for the portion of Basin _____ described as:

Water rights in the _____ River basin diverted or beneficially used from _____ (Creek) (River):

between its confluence with the _____ (Creek) (River) and its confluence with _____ (Creek) (River)

(OR) from its headwaters to its confluence with _____ (Creek) (River) with _____ (Creek) (River);

(OR) the entire _____ (Creek) (River) from its headwaters and its confluence with _____ (Creek) (River); and the mainstem of _____ (Creek) (River);

(OR) from its confluence with the _____ (Creek) (River) to the U.S.G.S. gauging station at _____.

The following tributaries are included in this petition: *(Here list the tributaries where you seek enforcement, or write "All", or "None.")*

We respectfully request that the Court: (1) refer this matter to the Montana Water Court pursuant to section 85-2-406(4), MCA; and (2) request that the Water Court provide the appropriate tabulations or lists of all existing rights and their relative priorities which are needed to enforce the Water Court decree on the above identified source.

We request that this Court appoint _____ as a water commissioner to enforce the Water Court decree on _____ Creek.

Respectfully submitted this ___ day of _____ 20____.

_____ _____

_____ _____

_____ _____

_____ _____

DISTRIBUTION OVERVIEW

WATER COMMISSIONER APPOINTMENT

- ❑ Order by District Court Appoints a Commissioner
- ❑ Stipulations in order can include:
  - Source
  - Commissioner(s)
  - Commissioner and Water User Duties
  - When Distribution Begins
  - Commissioner Compensation
    - Base rate, regardless of hours worked
    - Hourly or daily rate for time worked
    - Mileage reimbursement rate
- ❑ Commissioners are given the authority to distribute water in their distribution project (85-5-101, 105, MCA)

DISTRIBUTION OVERVIEW

EXAMPLE ORDER APPOINTING WATER COMMISSIONER

Water Commissioner's Duties. During the term of their appointment, the Water Commissioner must:

a. **Training.** In accordance with Mont. Code Ann. § 85-5-111(2), the Commissioner will provide proof of attendance of the 2024 Water Commissioner Training provided by the DNRC, if attended, or file a signed statement with the Clerk of this Court that they have previously completed a water commissioner training program or have experience as a water commissioner.

b. **Inspection of Measuring Devices.** The Water Commissioner should inspect water measuring devices: (1) within a reasonable time upon being notified the devices are turned on; (2) within a reasonable time upon being notified the devices are turned off; (3) within a reasonable time upon being notified of a change made while the water is turned on (i.e., change to flow rate or turnout); (4) on a random basis from time to time, as determined necessary by the Water Commissioner; and (5) as otherwise determined necessary and appropriate by the Water Commissioner or Court. As the season progresses, the Court may increase or decrease these requirements as circumstances dictate.

c. **Ditch Repair/Maintenance by Commissioner.** Pursuant to Mont. Code

9. **Water Commissioner's Worker's Compensation.** It is the obligation and responsibility of the water users and Water Commissioner to make certain that worker's compensation insurance exists for the Water Commissioner. Mont. Code Ann. § 85-5-101(4). Worker's compensation insurance is the obligation of the water user's *pro rata* in the same proportion as responsibility for the water commissioner's compensation. Before taking office, the Water Commissioner must file proof of worker's compensation insurance coverage. The Water Commissioner may have the cost of worker's compensation insurance separately billed at the time of appointment.

10. **Billing Water Users.** The Clerk of Court will bill each water user monthly for their share of the Commissioner's bill on a pro rata basis for water delivered in each month. The Clerk of Court shall bill each water user whose land is benefitted monthly for any additional time or expense incurred by the Commissioner in assisting a water user to access their points of diversion or conveyance systems. Mont. Code Ann. §§ 85-5-201 to 85-5-204.

11. **Dissatisfied Water Users; Billing Disputes.** Water users shall first attempt to resolve any water disputes directly with the Water Commissioner. In the event the matter cannot

DISTRIBUTION OVERVIEW

TABULATION REQUESTS

- ❑ District Court issues Request for Tabulation of Water Rights (Request) from Water Court
  - Request language is critical for distribution scope
- ❑ Water Court forwards Request to DNRC
- ❑ DNRC prepares tabulation of water rights based on language in Request
- ❑ DNRC sends Tabulations to Water Court
- ❑ Water Court sends Tabulations to District Court
- ❑ District Court provides Tabulations to their Commissioner(s)

DISTRIBUTION OVERVIEW

REQUESTING AN ACCURATE TABULATION

If a request lists:

- "Mainstem of Dry Creek"
- "Dry Creek Drainage"
- "Dry Creek and named tributaries"
- "Mainstem of Dry Creek between points A and B"
- "Mainstem of Dry Creek above/below point A"
- "Dry Creek Drainage above point A"
- "Dry Creek from headwaters to confluence with point A"

DNRC will provide:

- All rights on Dry Creek, no tributaries.
- All rights in the entire watershed.
- All rights on Dry Creek, plus all rights on formally named tributaries.
- All rights in the specified reach of Dry Creek.
- All rights in the specified reach of Dry Creek.
- All rights in the entire watershed, above the specified point.
- All rights on Dry Creek above point A, no tributaries

DISTRIBUTION OVERVIEW

EXAMPLE TABULATION REQUEST

EXAMPLE

MONTANA [NUMBER] JUDICIAL DISTRICT COURT, [NAME] COUNTY

IN THE MATTER OF THE PETITION OF [SOURCE] WATER USERS TO ENFORCE WATER COURT DECREE	))))	Cause No. XXXXXXXXX

REQUEST FOR DISTRIBUTION TABULATION

The Court received a petition to enforce a portion of the [Temporary Preliminary/ Preliminary/ Interlocutory/ Final] Decree issued [DATE] by the Montana Water Court in the [BASIN NAME], Basin No. [#].

Pursuant to Rule 31, W.R.Adj.R., this Court requests that the Montana Water Court provide an appropriate tabulation of all water rights and their relative priorities on the following portion of [SOURCE] for the purpose of enforcing a portion of the Water Court decree:

Water rights from [SOURCE] Creek and the following tributaries:

[INSERT TRIBUTARIES HERE]

The Clerk of Court will file this Request and provide a copy to the Montana Water Court

DNRC will provide a tabulation of all water rights with points of diversion on [SOURCE] Creek and all water rights with points of diversion on the named tributaries

Questions?

QUESTION FOR A PRIZE!

What percentage of water users / flow rate must be represented in an initial petition?

ROLES AND RESPONSIBILITIES

Big Hole Flume – WSB DNR

ROLE OF WATER USERS

WATER USERS RIGHTS AND DUTIES

Initiate the Appointment of Water Commissioners and Distribution Projects

Statutes: 85-5-101, 106, 108; 85-5-204-206; 85-5-301; 85-5-302; and 85-5-401, 406, MCA.

- Petition Court to appoint Commissioner
- Request Commissioner to have duty to maintain and repair water systems
- Avoid interference with Commissioner work
- Pay Commissioner expenses
- Maintain measuring devices and diversion works
- File objections

ROLE OF COURTS

DISTRICT COURT VS. WATER COURT

- District Court Judges
- District Court Clerks
- Water Court

ROLE OF COURTS

DISTRICT COURT

District Court Judges

Statutory Duties
85-5 and 3-7-212 MCA

- Review petition for 15% compliance
- Issue Orders:
  - Appointing Water Commissioner
  - Requesting tabulation of water rights
  - Fix and determine amounts owed by water users to commissioners
- May:
  - Appoint water mediators
  - Issue injunctions
  - Assist commissioners with noncompliance issues
- Handling Objections From:
  - Water users
  - Water Commissioners (egregious actions or tampering with measuring devices)

ROLE OF COURTS

DISTRICT COURT

District Court Clerks

Statutory Duties
85-5-103, 107; 85-5-201, 204, MCA

- File Commissioner's sworn oath and bond
- Review copy of Commissioner's worker compensation
- Provide Tabulations to Commissioner
- Receive Commissioner Records
- Letter to water users regarding commissioner expenses
- General communication

ROLE OF COURTS

WATER COURT

Statutory Duties

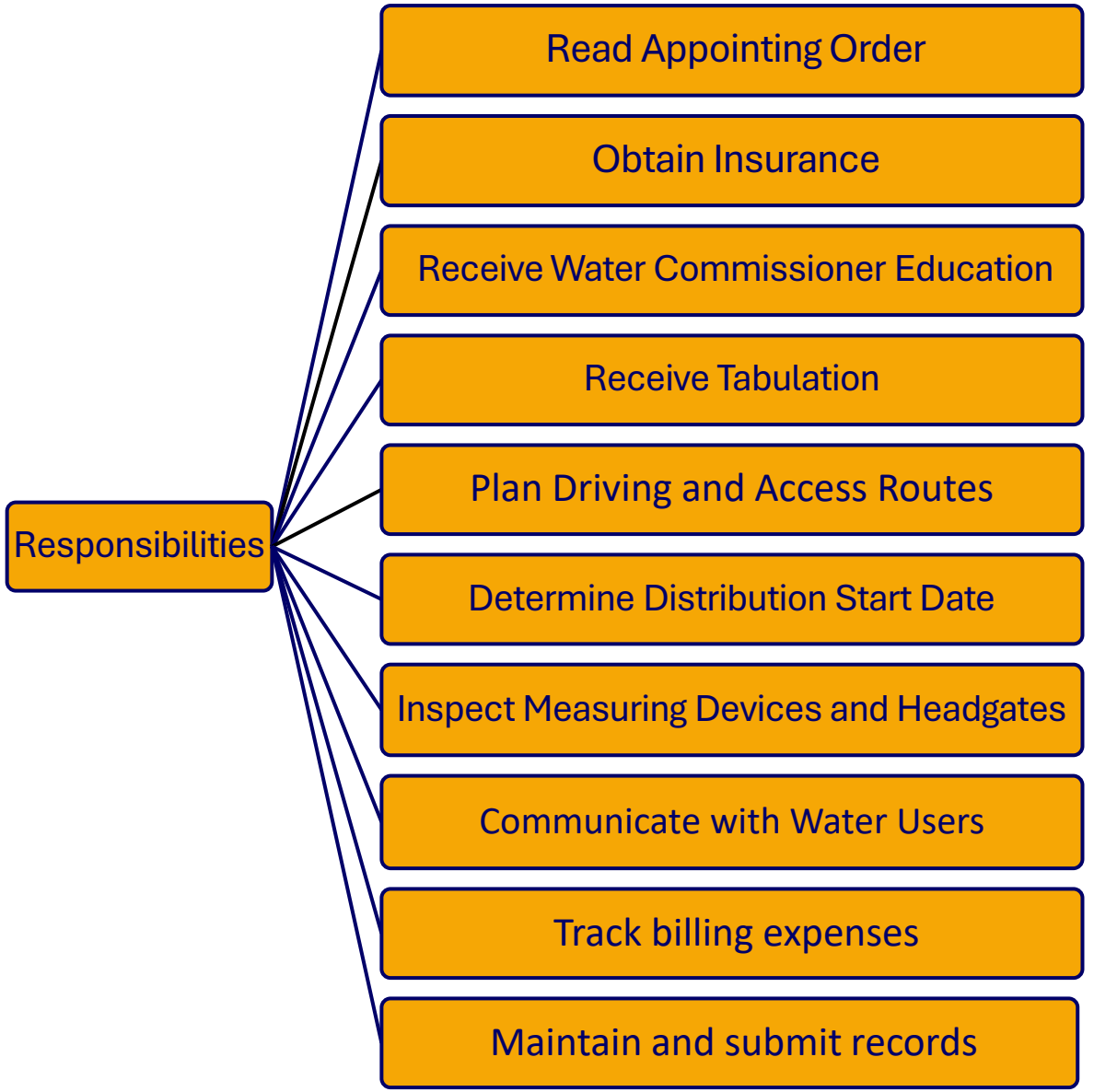
3-7-212 MCA

- ❑ Serves as a liaison between District Court and DNRC.
- ❑ Handles questions about specific water rights.
- ❑ Adjudicates water rights.
- ❑ Issues decrees.
  - The most recent version of Statements of Claim decreed by the Water Court should be in distribution projects

ROLE OF WATER COMMISSIONER

Responsibilities

- Water Commissioners are primarily responsible for the accurate distribution and recordkeeping of water in a distribution project.



ROLE OF WATER COMMISSIONER

AUTHORITIES

Statutory Duties
85-5-101-111; 85-5-201-204; 85-5-302; 85-5-402-404, 407 MCA

- Distributing water
- Entering ditches
- Accessing PODs and measuring devices
- Adjusting flows according to priority date and flow rate
- Maintaining and repairing ditches
- Arresting individuals for non-compliance
- Shutting off water for:
  - Junior priority date (Prior Appropriation)
  - Lack of payment
  - Non-cooperation with distribution infrastructure

COMMISSIONER AUTHORITIES

DO'S AND DON'TS

Commissioners may not:

- Change points of diversion (PODs)
- Change period of diversion
- Deliver water based on preferred use
- Deliver water to non-water right holders
- Deliver water outside of priority unless senior user asks to be shut off
- Perform construction in or near a stream without a 310 permit.

ROLE OF DNRC

85-5-111 MCA

Education

- Water Commissioner Manual
- Water Commissioner Seminar
- Resources on DNRC website

Technical Assistance

- 1-1 site visits with DNRC
- Tabulation Preparation
- Water Mapper Application
- General Questions

• Records Keeping

- Water Rights Database

Thank you

Questions?

QUESTION FOR A PRIZE!

Who is responsible for issuing decrees for all river basins in Montana?

Break

PROFESSIONAL SKILLS

PROFESSIONAL SKILLS

RECORDS

- Daily records are required (85-5-107 MCA)
  - Records should be organized and clear
  - Clerk must be able to discern for accurate billing
  - Records could be used outside distribution process
- Records are submitted to District Court monthly or seasonally
  - Appointing Order might set frequency of submittal
  - Two or more Commissioners can file joint summary of records
- Commissioners and Clerks should keep copies
- Last year's records could impact this year's billing

PROFESSIONAL SKILLS

RECORDS

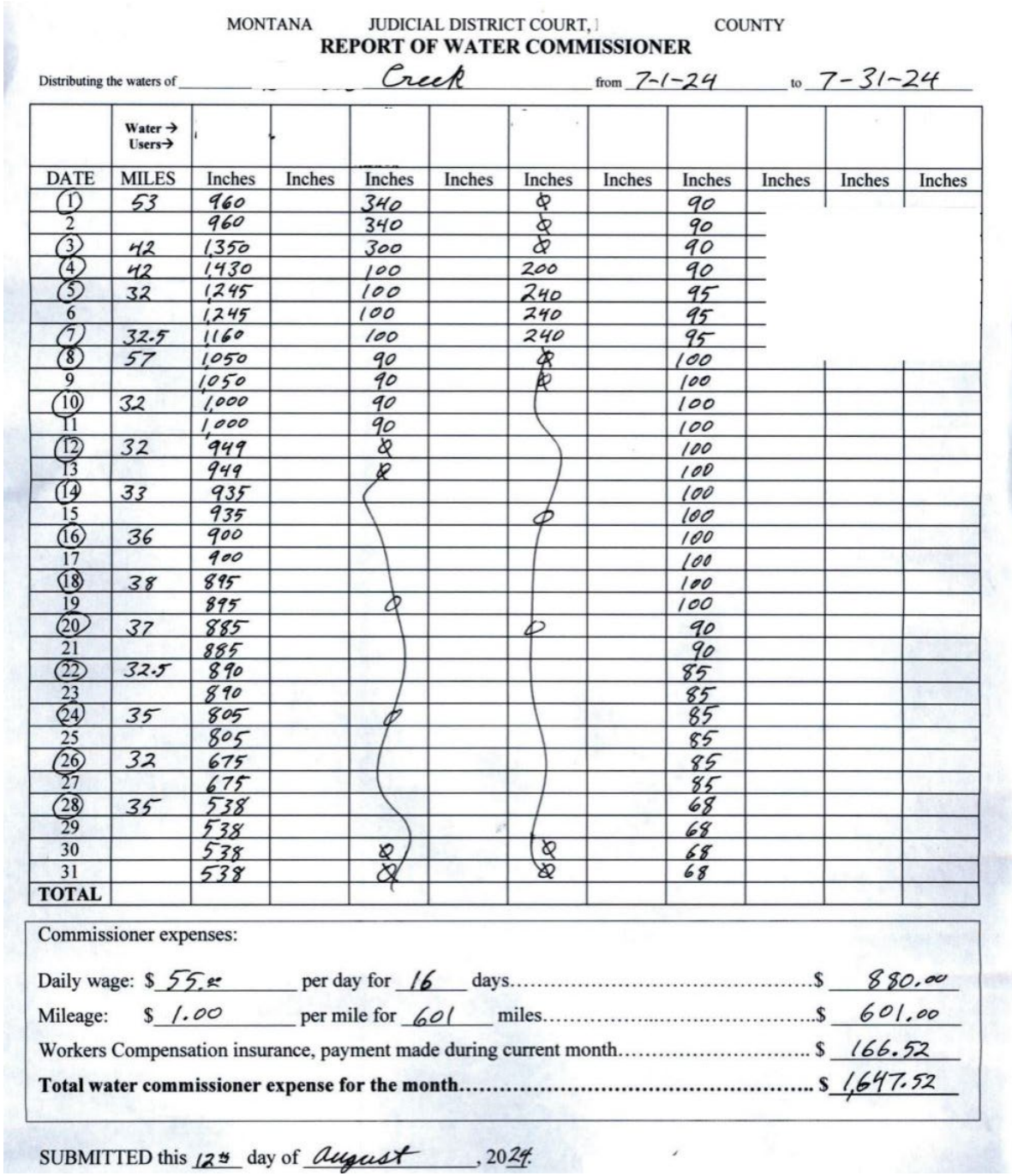
- Daily Records must indicate
  - Daily quantity of water distributed to each point of diversion (POD) and water user
  - The total monthly quantity of water distributed to each water user
  - The total cost of distributing water
  - Any costs that are for individual water users, not shared proportionally
  - The proportion of water distributed to each water user
    - The amount each water user owes based on this proportion and the total cost

PROFESSIONAL SKILLS

RECORDS - ANALOG EXAMPLE

Field Records Example

- Inches of Water Per Day
- Daily Water Distribution
  - Quantity distributed to each POD
  - Quantity for each water user
- Monthly Water Distribution
  - Total quantity for each water user
- Daily Wage and Mileage
  - Total cost of water distribution



MONTANA JUDICIAL DISTRICT COURT,] COUNTY

REPORT OF WATER COMMISSIONER

Distributing the waters of _____ Creek from 7-1-24 to 7-31-24

	Water → Users→										
DATE	MILES	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches
(1)	53	960		340		⊘		90			
2		960		340		⊘		90			
(3)	42	1,350		300		⊘		90			
(4)	42	1,430		100		200		90			
(5)	32	1,245		100		240		95			
6		1,245		100		240		95			
(7)	32.5	1160		100		240		95			
(8)	57	1,050		90		⊘		100			
9		1,050		90		⊘		100			
(10)	32	1,000		90				100			
11		1,000		90				100			
(12)	32	949		⊘				100			
13		949		⊘				100			
(14)	33	935						100			
15		935				⊘		100			
(16)	36	900						100			
17		900						100			
(18)	38	895						100			
19		895		⊘				100			
(20)	37	885				⊘		90			
21		885						90			
(22)	32.5	890						85			
23		890						85			
(24)	35	805		⊘				85			
25		805						85			
(26)	32	675						85			
27		675						85			
(28)	35	538						68			
29		538						68			
30		538		⊘		⊘		68			
31		538		⊘		⊘		68			
TOTAL											

Commissioner expenses:

Daily wage: $ 55.00 per day for 16 days..... $ 880.00

Mileage: $ 1.00 per mile for 601 miles..... $ 601.00

Workers Compensation insurance, payment made during current month..... $ 166.52

Total water commissioner expense for the month..... $ 1,647.52

SUBMITTED this 12th day of August, 2024.

PROFESSIONAL SKILLS

COMPENSATION AND FEES

- Judges set Commissioner compensation in appointing Order (85-5-101, 85-5-405, MCA)
- Some Commissioner fee rates might be set in appointing order, such as mileage reimbursement rate
- Fees can include:
  - Workers Compensation Insurance
  - Bond
  - Maintenance and Repairs
  - Telephone Expenses
  - Training
  - Travel Reimbursements

PROFESSIONAL SKILLS

WATER USER RESPONSIBILITY FOR COMPENSATION AND FEES

- Water users in distribution project are responsible for paying a proportionate share of commissioner costs (compensation and fees)
  - Except additional fees specific to a certain user
- Example of proportionate share
  - Commissioner distributes 25% of the water in a season to Jane Doe, Jane Doe is responsible for 25% of the Commissioner's expenses.
- Example of proportionate share and extra fees
  - Commissioner distributes 25% of the water in a season to Jane Doe, Jane Doe is responsible for 25% of the Commissioner's expenses.
  - Commissioner also replaced her measuring device. Jane Doe will owe 25% of the expenses plus the cost of the measuring device and Commissioner labor.

PROFESSIONAL SKILLS

BILLING PROCESS 85-5-204-206, MCA

- ❑ Commissioner submits distribution records to District Court
- ❑ Clerk determines amount each water user owes
  - Based on proportion of water distributed and any extra fees
- ❑ Clerk sends a letter to water users
  - Informing water users how much they owe Commissioners
  - Informing water users of 20 calendar day objection period to expenses from date of letter
- ❑ Judge issues an Order setting final amounts due to Commissioner
  - After 20-day objection period
- ❑ Water users must pay Commissioners or water could be shut off

PROFESSIONAL SKILLS

BILLING PROCESS 85-5-201, MCA

- Commissioners can request pre-season billing from District Court to offset distribution costs
- If pre-season billing is authorized, same billing process applies
  - Can bill 80% of total from previous year's records
  - If amount billed pre-season is more than should be at end of season, Commissioners must reimburse
  - If amount billed pre-season is not enough at end of season, additional billing can occur to cover the gap

PROFESSIONAL SKILLS

RECORDS - DIGITAL EXAMPLE

water commissioner's report
for the month June 2024

Letters A-F represent water users
WR represents water right. number. Could exchange with ditch name

	A	B	C	D	E	F	G	H	I	J	K	L
1	Jun-24	Miles	Water User A - WR 1	A - WR 2	A- WR 3	Water User B - WR 1	B- WR 2	B - WR 3	Water User C - WR 1	C - WR 2	C - WR 3	Water User D - WR 1
2	1	0	775	640	182	0	77	20	40	60	60	100
3	2	0	775	640	182	0	77	20	40	60	60	100
4	3	20	775	640	182	112	77	20	40	60	60	100
5	4	0	775	640	182	112	77	20	40	60	60	100
6	5	20	775	640	182	112	77	20	40	60	60	100
7	6	0	775	640	182	112	77	20	40	60	60	100
8	7	22	1522	620	182	112	77	20	40	60	60	100
9	8	0	1522	620	182	112	77	20	40	60	60	100
10	9	27	1522	620	182	119	168	20	40	60	60	100
11	10	28	1522	620	1762	112	186	20	40	60	60	100
12	11	0	1522	620	1762	112	168	20	40	60	60	100
13	12	0	1522	620	1762	112	168	20	40	60	60	100
14	13	23	1522	620	1762	112	168	20	40	60	60	100
15	14	18	584	620	1762	112	168	20	40	60	60	100
16	15	32	584	620	1762	112	168	20	40	60	60	100
17	16	0	584	620	1762	112	168	20	40	60	60	100
18	17	0	584	620	1762	112	168	20	40	60	60	100
19	18	0	584	620	1762	112	168	20	40	60	60	100
20	19	0	584	620	1762	112	168	20	40	60	60	100
21	20	0	584	620	1762	112	168	20	40	60	60	100
22	21	22	202	459	1762	0	152	20	40	60	60	100
23	22	0	202	459	1762	0	0	20	40	60	60	100
24	23	0	202	459	1762	0	0	20	40	60	60	100
25	24	20	202	459	1762	0	0	0	40	0	60	100
26	25	20	202	640	1762	0	0	0	0	0	60	0

PROFESSIONAL SKILLS

TRACKING COMPENSATION AND FEES

	A	B	C	D	E	F	G	H	I	J	K	L
35	Total water distributed		122179	miners inches								
36												
37	Water Commissioner expenses:											
38		11	days @	$120.00	=	$1,320.00						
39		252	miles @	$1.00	=	$252.00						
40				Workers	Comp Ins	$0.00						
41					TOTAL	$1,572.00						
42												
43												
44												
45	**Assessment:**		**inches**	**cost**	**rem. bal. >/= $2000**	**Total Due to Water Comm.**						
46	Water User A		70598	$908.34	$428.00	**$1,336.34**		**Please make payments payable and mail to:**				
47	Water User B		5535	$71.22	0	**$71.22**						
48	Water User C		4196	$53.99	0	**$53.99**						
49	Water User D		28827	$370.90	0	**$370.90**						
50	Water User E		11873	$152.76	0	**$152.76**						
51	Water User F		1150	$14.80	0	**$14.80**						
52	TOTAL		122179	$1,572.00								
53	Total due to WC					**$2,000.00**						
54												
55												

Q & A
- District Court Clerk

WSB DNRC

QUESTION FOR A PRIZE!

How does a Commissioner get paid?

CONFLICT MANAGEMENT

Madison River – WSB

CONFLICT MANAGEMENT

CONFLICT AS A CONTEXT

- Components of conflict:
  - Multiple parties
  - Substance
  - Procedures
- Distribution projects exist because there is already conflict.
- Resource scarcity drives conflict in this context.
- Commissioners are hired to manage existing conflict.

Thuermer Jr., 2021

CONFLICT MANAGEMENT

MANAGING CONFLICT

Unmanaged Conflict:

- Conflict persists and negative outcomes occur.
- Relationships are destroyed or damaged.
- Physical or psychological harm can occur.
- Leads to a loss of human and natural resources.
- Leads to an erosion of communities.

Managed Conflict:

- Can provide positive outcomes.
- Depends on continued communication.
- Fosters a sense of understanding.
- Opens the door for problem solving.
- Drives constructive change.
- Creates precedents for future problem solving.
- Addresses the people, processes, and source.

CONFLICT MANAGEMENT

RESPONDING TO CONFLICT

Proactive Responses:

- ❑ Pre-season meetings.
- ❑ Post-season review.
- ❑ Defining expectations and responsibilities.
- ❑ Ongoing record-keeping and documentation.
- ❑ Regular and clear communication.
- ❑ Maintaining access and device functionality.

Active Responses:

- ❑ Documenting specific incidents; setting up game cameras.
- ❑ Responding to noncompliant behavior in writing.
- ❑ Directed education.
- ❑ Requesting a mediator from District Court.

Authoritative Responses:
(In consultation with Judges and/or law enforcement.)

- ❑ Locking headgates.
- ❑ Issuing Court Orders and Injunctions.
- ❑ Shutting off a noncompliant user's water.
- ❑ Arresting noncompliant users.

INTENSITY INCREASES

FREQUENCY DECREASES

Conflict Management Discussion

QUESTION FOR A PRIZE!

Name at least one proactive conflict management technique in the Water Commissioner context.

Lunch

Reconvene at 1:15 p.m.

WATER RIGHTS 101
&
TABULATIONS

WATER RIGHTS 101

PRIOR APPROPRIATION

- Western U.S.
- The right to use water is derived from beneficial use.
- In times of shortage, junior users are cut-off so that senior users are fully satisfied.
- Commissioners follow “first in time, first in right” principle.

WATER RIGHTS 101

BASIC MONTANA WATER LAW

- Water distribution is based on the Prior Appropriation Doctrine, or the “first in time, first in right” principle.
- Water users can’t alter their use of water if that alteration adversely effects another water right.
- Commissioners must distribute water to fulfill rights as they are decreed / permitted.

WATER RIGHTS 101

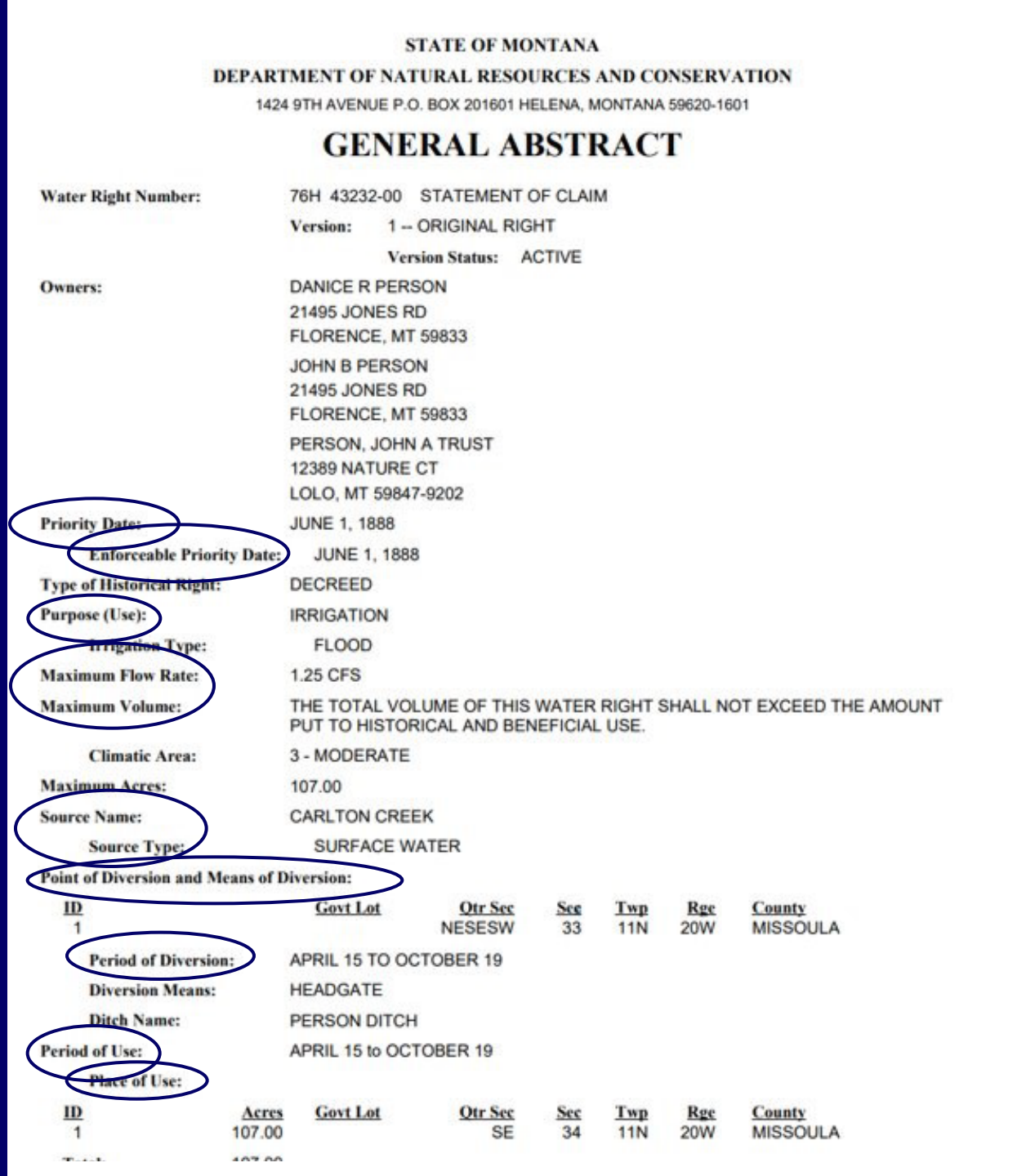
TYPES OF WATER RIGHTS

- ❑Statements of Claim (STOC)
  - Pre-1973 Priority dates come from the first day water was put to beneficial use or filed at the Courthouse
- ❑Permits
  - Post-1973 priority dates come from when application was submitted to the DNRC
- ❑Changes
  - Could be Permits or STOCs that have been validly changed through the DNRC. Keep same priority date.
- ❑All are involved in distribution projects
- ❑Commissioners follow "first in time, first in right" principle

WATER RIGHTS 101

ELEMENTS OF WATER RIGHTS

- Priority Date
- Enforceable Priority Date
- Purpose
- Flow Rate
- Volume
- Source
- Point of Diversion
- Means of Diversion
- Period of Diversion
- Period of Use
- Place of Use



STATE OF MONTANA
DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
1424 9TH AVENUE P.O. BOX 201601 HELENA, MONTANA 59620-1601

GENERAL ABSTRACT

Water Right Number: 76H 43232-00 STATEMENT OF CLAIM
Version: 1 -- ORIGINAL RIGHT
Version Status: ACTIVE

Owners: DANICE R PERSON
21495 JONES RD
FLORENCE, MT 59833

JOHN B PERSON
21495 JONES RD
FLORENCE, MT 59833

PERSON, JOHN A TRUST
12389 NATURE CT
LOLO, MT 59847-9202

Priority Date: JUNE 1, 1888
Enforceable Priority Date: JUNE 1, 1888
Type of Historical Right: DECREED
Purpose (Use): IRRIGATION
Irrigation Type: FLOOD
Maximum Flow Rate: 1.25 CFS
Maximum Volume: THE TOTAL VOLUME OF THIS WATER RIGHT SHALL NOT EXCEED THE AMOUNT PUT TO HISTORICAL AND BENEFICIAL USE.
Climatic Area: 3 - MODERATE
Maximum Acres: 107.00
Source Name: CARLTON CREEK
Source Type: SURFACE WATER

Point of Diversion and Means of Diversion:

ID	Govt Lot	Qtr Sec	Sec	Twp	Rge	County
1		NESESW	33	11N	20W	MISSOULA

Period of Diversion: APRIL 15 TO OCTOBER 19
Diversion Means: HEADGATE
Ditch Name: PERSON DITCH
Period of Use: APRIL 15 to OCTOBER 19
Place of Use:

ID	Acres	Govt Lot	Qtr Sec	Sec	Twp	Rge	County
1	107.00		SE	34	11N	20W	MISSOULA

TABULATIONS

FIVE INDEXES

- ❑Map/ Diversion Sites
- ❑Legal Land Description
- ❑Priority Date & Remarks
- ❑Ownership
- ❑ Water Rights

#E013 - Missoula County

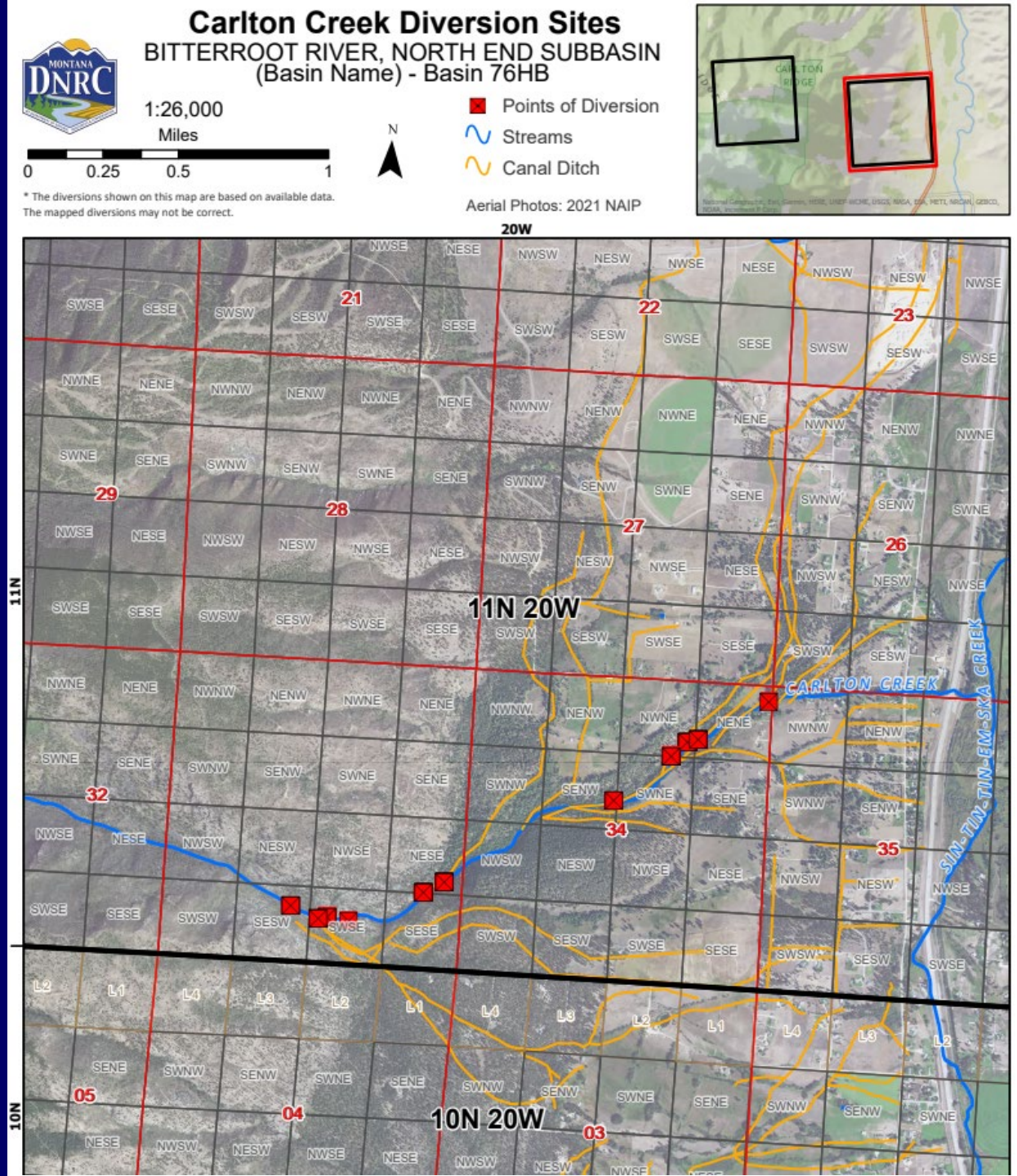
Basin 76H

- Map / Diversion Sites
- Legal Land Description Map Reference
- Priority Date & Commissioner Remarks Tabulation
- Owner Index
- Water Right Index

TABULATIONS

MAP / DIVERSION SITES INDEX

- ❑ Main overview map
- ❑ Larger-scale maps indicating points of diversion (PODs) locations
  - Commissioners only distribute water at primary PODs unless directed otherwise
  - Stored water has exceptions



2024 Legal Land Dscr. Map Reference - Carlton Creek Distribution Area

Section	Qtr Sect.	Gov. Lot	Owner	Owner (first)	Water Right #	Ver. Type	POD #	Enf. Priority Date	Use	Source	Diversion Name	Period of Diversion	Period of Use	Cfs	Gpm
11N20W - Township and Range															
33	NESESW		PERSON	JOHN	76H 43232 00	ORIG	1	1888-06-01	IRRIGATION	CARLTON CREEK	PERSON DITCH	04/15 to 10/19	04/15 to 10/19	1.25	561
33	NESESW		PERSON, JOHN A TRUST		76H 43232 00	ORIG	1	1888-06-01	IRRIGATION	CARLTON CREEK	PERSON DITCH	04/15 to 10/19	04/15 to 10/19	1.25	561
33	NESESW		PERSON	DANICE	76H 43232 00	ORIG	1	1888-06-01	IRRIGATION	CARLTON CREEK	PERSON DITCH	04/15 to 10/19	04/15 to 10/19	1.25	561
33	NWSESE		MACLAY	SARAH	76H 151115 00	ORIG	3	1890-06-10	STOCK	CARLTON CREEK	SCHMITZ DITCH	03/01 to 08/04	03/01 to 08/04		
33	NWSESE		LOLO RANCH III LLC		76H 151115 00	ORIG	3	1890-06-10	STOCK	CARLTON CREEK	SCHMITZ DITCH	03/01 to 08/04	03/01 to 08/04		
33	NWSESE		LOLO RANCH II LLC		76H 151115 00	ORIG	3	1890-06-10	STOCK	CARLTON CREEK	SCHMITZ DITCH	03/01 to 08/04	03/01 to 08/04		
33	NWSESE		LOLO RANCH LLC		76H 151115 00	ORIG	3	1890-06-10	STOCK	CARLTON CREEK	SCHMITZ DITCH	03/01 to 08/04	03/01 to 08/04		
33	NWSESE		LOLO RANCH IV LLC		76H 151115 00	ORIG	3	1890-06-10	STOCK	CARLTON CREEK	SCHMITZ DITCH	03/01 to 08/04	03/01 to 08/04		
33	NWSESE		WILSON	MARVIN	76H 33710 00	ORIG	2	1890-06-10	IRRIGATION	CARLTON CREEK	SCHMITZ DITCH	04/01 to 09/30	04/01 to 09/30	1.25	561
33	NWSESE		HEIDEL	MICHELE	76H 33710 00	ORIG	2	1890-06-10	IRRIGATION	CARLTON CREEK	SCHMITZ DITCH	04/01 to 09/30	04/01 to 09/30	1.25	561
33	NWSESE		HEIDEL	DAVID	76H 33710 00	ORIG	2	1890-06-10	IRRIGATION	CARLTON CREEK	SCHMITZ DITCH	04/01 to 09/30	04/01 to 09/30	1.25	561
33	NWSESE		MACLAY	SARAH	76H 151114 00	POST	3	1890-06-10	STOCK	CARLTON CREEK	SCHMITZ DITCH	03/01 to 07/04	03/01 to 11/04		
33	NWSESE		LOLO RANCH II LLC		76H 151114 00	POST	3	1890-06-10	STOCK	CARLTON CREEK	SCHMITZ DITCH	03/01 to 07/04	03/01 to 11/04		
33	NWSESE		LOLO RANCH III LLC		76H 151114 00	POST	3	1890-06-10	STOCK	CARLTON CREEK	SCHMITZ DITCH	03/01 to 07/04	03/01 to 11/04		
33	NWSESE		LOLO RANCH LLC		76H 151114 00	POST	3	1890-06-10	STOCK	CARLTON CREEK	SCHMITZ DITCH	03/01 to 07/04	03/01 to 11/04		
33	NWSESE		LOLO RANCH IV LLC		76H 151114 00	POST	3	1890-06-10	STOCK	CARLTON CREEK	SCHMITZ DITCH	03/01 to 07/04	03/01 to 11/04		
33	NWSESE		MACLAY	SARAH	76H 151117 00	ORIG	3	1888-06-01	STOCK	CARLTON CREEK	SCHMITZ DITCH	03/01 to 11/04	03/01 to 11/04		
33	NWSESE		LOLO RANCH LLC		76H 151117 00	ORIG	3	1888-06-01	STOCK	CARLTON CREEK	SCHMITZ DITCH	03/01 to 11/04	03/01 to 11/04		
33	NWSESE		LOLO RANCH III LLC		76H 151117 00	ORIG	3	1888-06-01	STOCK	CARLTON CREEK	SCHMITZ DITCH	03/01 to 11/04	03/01 to 11/04		
													04		
													04		
													04		
33	NWSESE		LOLO RANCH LLC		76H 151119 00	ORIG	3	1896-07-28	STOCK	CARLTON CREEK	SCHMITZ DITCH	03/01 to 08/04	03/01 to 08/04		
33	NWSESE		LOLO RANCH III LLC		76H 151119 00	ORIG	3	1896-07-28	STOCK	CARLTON CREEK	SCHMITZ DITCH	03/01 to 08/04	03/01 to 08/04		

Legal Land Description

2024 Priority Date Index - Carlton Creek Distribution Area

Enf. Priority Date	Owner	Owner (first)	Ver. Type	POD #	Use	Qtr Sect.	Sect.	Twp Rng	Source	Diversion Name	Period of Diversion	Period of Use	Cfs	Gpm
76H 151097 00														
1872-05-01	MACLAY	H BRUCE	CHAU	1	IRRIGATION	NWSESE	33	1N20W	CARLTON CREEK	SCHMITZ DITCH	04/01 to 10/19	04/01 to 10/19	1.25	561
1872-05-01	LOLO RANCH LLC		CHAU	1	IRRIGATION	NWSESE	33	1N20W	CARLTON CREEK	SCHMITZ DITCH	04/01 to 10/19	04/01 to 10/19	1.25	561
1872-05-01	LOLO RANCH III LLC		CHAU	1	IRRIGATION	NWSESE	33	1N20W	CARLTON CREEK	SCHMITZ DITCH	04/01 to 10/19	04/01 to 10/19	1.25	561
1872-05-01	LOLO RANCH II LLC		CHAU	1	IRRIGATION	NWSESE	33	1N20W	CARLTON CREEK	SCHMITZ DITCH	04/01 to 10/19	04/01 to 10/19	1.25	561
1872-05-01	LOLO RANCH IV LLC		CHAU	1	IRRIGATION	NWSESE	33	1N20W	CARLTON CREEK	SCHMITZ DITCH	04/01 to 10/19	04/01 to 10/19	1.25	561
76H 114356 00														
1872-07-01	CHARLES	LEROY	ORIG	1	IRRIGATION	SWNENE	34	1N20W	CARLTON CREEK	HENDRICKSON DITCH	05/15 to 09/19	05/15 to 09/19	.62	282
1872-07-01	CHARLES	TRACY	ORIG	1	IRRIGATION	SWNENE	34	1N20W	CARLTON CREEK	HENDRICKSON DITCH	05/15 to 09/19	05/15 to 09/19	.62	282
76H 118401 00														
1872-07-01	COREN	EVAN	ORIG	1	IRRIGATION	SWNENE	34	1N20W	CARLTON CREEK	HENDRICKSON DITCH	04/01 to 10/31	04/01 to 10/31	.27	124
1872-07-01	KEALEY	CLARE	ORIG	1	IRRIGATION	SWNENE	34	1N20W	CARLTON CREEK	HENDRICKSON DITCH	04/01 to 10/31	04/01 to 10/31	.27	124
76H 118402 00														
1872-07-01	COREN	EVAN	ORIG	1	STOCK	SWNENE	34	1N20W	CARLTON CREEK	HENDRICKSON DITCH	01/01 to 12/31	01/01 to 12/31		
1872-07-01	KEALEY	CLARE	ORIG	1	STOCK	SWNENE	34	1N20W	CARLTON CREEK	HENDRICKSON DITCH	01/01 to 12/31	01/01 to 12/31		
76H 147423 00														
1872-07-01	HANSEN	RYAN	ORIG	1	IRRIGATION	SWNENE	34	1N20W	CARLTON CREEK	HENDRICKSON DITCH	04/15 to 09/30	04/15 to 09/30	.12	56.25
1872-07-01	HANSEN	JORDAN	ORIG	1	IRRIGATION	SWNENE	34	1N20W	CARLTON CREEK	HENDRICKSON DITCH	04/15 to 09/30	04/15 to 09/30	.12	56.25
76H 147614 00														
1872-07-01	PORCH FAMILY ASSOCIATION		ORIG	1	IRRIGATION	SWNENE	34	1N20W	CARLTON CREEK	HENDRICKSON DITCH	04/15 to 09/30	04/15 to 09/30	.75	336.75
1872-07-01	CARLTON CREEK LLC		ORIG	1	IRRIGATION	SWNENE	34	1N20W	CARLTON CREEK	HENDRICKSON DITCH	04/15 to 09/30	04/15 to 09/30	.75	336.75
1872-07-01	PORCH	DANIEL	ORIG	1	IRRIGATION	SWNENE	34	1N20W	CARLTON CREEK	HENDRICKSON DITCH	04/15 to 09/30	04/15 to 09/30	.75	336.75
											9/30	04/15 to 09/30	.75	336.75
											0/04	05/01 to 10/04	.36	164
76H 150903 00														
1872-07-01	LEMM SCOTT	MICHELLE	ORIG	1	IRRIGATION	SWNENE	34	1N20W	CARLTON CREEK	HENDRICKSON DITCH	04/15 to 10/19	04/15 to 10/19	.56	253
1872-07-01	SCOTT	GARTH	ORIG	1	IRRIGATION	SWNENE	34	1N20W	CARLTON CREEK	HENDRICKSON DITCH	04/15 to 10/19	04/15 to 10/19	.56	253

Priority Date & Remarks Index

COMMISSIONER REMARK INDEX

Water Right #		
	76H 26352 00	DITCH NAME: CHARBONO RISHEL DITCH
	76H 26355 00	DITCH NAME: CHARBONO RISHEL DITCH
	76H 108718 00	DITCH NAME: CHARBONO RISHEL DITCH
	76H 108718 00	NO FLOW RATE HAS BEEN DECREED BECAUSE THIS USE CONSISTS OF STOCK DRINKING DIRECTLY FROM THE SOURCE, OR FROM A DITCH SYSTEM.
	76H 108718 00	DITCH NAME: JONES DITCH
	76H 108718 00	NO FLOW RATE HAS BEEN DECREED BECAUSE THIS USE CONSISTS OF STOCK DRINKING DIRECTLY FROM THE SOURCE, OR FROM A DITCH SYSTEM.
	76H 108719 00	DITCH NAME: CHARBONO RISHEL DITCH
	76H 108719 00	DITCH NAME: JONES DITCH
	76H 119992 00	CARLTON CREEK IS USED AS A NATURAL CARRIER TO CONVEY WATER RELEASED FROM LITTLE CARLTON LAKE TO SECONDARY POINTS OF DIVERSION LOCATED IN THE SENESE SEC 33, NWSESE SEC 33, SWSWSE SEC 33, SESWNW SEC 34, SWSENW SEC 34, SENWNE SEC 34, NENENE SEC 34, NWNWNW SEC 35, ALL IN TWP 11N RGE 20W, MISSOULA COUNTY.
	76H 119992 00	DITCH NAME: BOAST DITCH (STORAGE)
	76H 119992 00	DITCH NAME: CHARBONO RISHEL DITCH (STORAGE)
	76H 119992 00	DITCH NAME: LOWER WALKER DITCH (STORAGE)
	76H 119992 00	DITCH NAME: RHODES DITCH (STORAGE)
	76H 119992 00	DITCH NAME: RUMMEL DITCH (STORAGE)
	76H 119992 00	DITCH NAME: SCHMITZ DITCH (STORAGE)
	76H 119992 00	DITCH NAME: UPPER MACLAY DITCH (STORAGE)
		ON LAKE TO SECONDARY POINTS OF DIVERSION LOCATED IN THE SENESE SEC 33, NWSESE SEC 33, SWSWSE SEC 33, SESWNW SEC 34, SWSENW SEC 34, SENWNE SEC 34, NENENE SEC 34, NWNWNW SEC 35, ALL IN TWP 11N RGE 20W, MISSOULA COUNTY.

Priority Date & Remarks Index

2024 Owner Index - Carlton Creek Distribution Area

Owner	Owner (first)	Enf. Priority Date	Water Right #	Ver. Type	POD #	Use	Qtr Sect.	Sect.	Twp Rng	Source	Diversion Name	Period of Diversion	Period of Use	Cfs	Gpm
ABPLANALP	ROBERT	1881-06-15	76H 30013289	ORIG	1	STOCK	NWSWSE	33	11N20	CARLTON CREEK	CHARBONO-RISHEL DITCH	04/15 to 10/19	04/15 to 10/19		
ABPLANALP	ROBERT	1881-06-15	76H 30013291	ORIG	1	IRRIGATION	NWSWSE	33	11N20	CARLTON CREEK	CHARBONO-RISHEL DITCH	04/15 to 10/19	04/15 to 10/19	.85	381.48
ADAMSON	MOLLY	1881-06-15	76H 30013289	ORIG	1	STOCK	NWSWSE	33	11N20	CARLTON CREEK	CHARBONO-RISHEL DITCH	04/15 to 10/19	04/15 to 10/19		
ADAMSON	MOLLY	1881-06-15	76H 30013291	ORIG	1	IRRIGATION	NWSWSE	33	11N20	CARLTON CREEK	CHARBONO-RISHEL DITCH	04/15 to 10/19	04/15 to 10/19	.85	381.48
ALLAN	JUDITH	1896-07-28	76H 151094 00	POST	1	IRRIGATION	SENWNE	34	11N20	CARLTON CREEK	LOWER MACLAY DITCH	04/01 to 11/04	04/01 to 11/04	2.5	1122
ALLAN	JOHN	1896-07-28	76H 151094 00	POST	1	IRRIGATION	SENWNE	34	11N20	CARLTON CREEK	LOWER MACLAY DITCH	04/01 to 11/04	04/01 to 11/04	2.5	1122
ALLAN	JUDITH	1896-07-28	76H 151094 00	POST	2	IRRIGATION	SENESE	33	11N20	CARLTON CREEK	UPPER MACLAY DITCH	04/01 to 11/04	04/01 to 11/04	2.5	1122
ALLAN	JOHN	1896-07-28	76H 151094 00	POST	2	IRRIGATION	SENESE	33	11N20	CARLTON CREEK	UPPER MACLAY DITCH	04/01 to 11/04	04/01 to 11/04	2.5	1122
ALLAN	JUDITH	1896-07-28	76H 151094 00	POST	3	IRRIGATION	NWSESE	33	11N20	CARLTON CREEK	SCHMITZ DITCH	04/01 to 11/04	04/01 to 11/04	2.5	1122
ALLAN	JOHN	1896-07-28	76H 151094 00	POST	3	IRRIGATION	NWSESE	33	11N20	CARLTON CREEK	SCHMITZ DITCH	04/01 to 11/04	04/01 to 11/04	2.5	1122
ALLAN	JOHN	1884-08-01	76H 151095 00	POST	1	IRRIGATION	SENWNE	34	11N20	CARLTON CREEK	LOWER MACLAY DITCH	04/01 to 11/04	04/01 to 11/04	3	1346.4
ALLAN	JUDITH	1884-08-01	76H 151095 00	POST	1	IRRIGATION	SENWNE	34	11N20	CARLTON CREEK	LOWER MACLAY DITCH	04/01 to 11/04	04/01 to 11/04	3	1346.4
ALLAN	JOHN	1884-08-01	76H 151095 00	POST	2	IRRIGATION	SENESE	33	11N20	CARLTON CREEK	UPPER MACLAY DITCH	04/01 to 11/04	04/01 to 11/04	3	1346.4
ALLAN	JUDITH	1884-08-01	76H 151095 00	POST	2	IRRIGATION	SENESE	33	11N20	CARLTON CREEK	UPPER MACLAY DITCH	04/01 to 11/04	04/01 to 11/04	3	1346.4
ALLAN	JOHN	1884-08-01	76H 151095 00	POST	3	IRRIGATION	NWSESE	33	11N20	CARLTON CREEK	SCHMITZ DITCH	04/01 to 11/04	04/01 to 11/04	3	1346.4
ALLAN	JUDITH	1884-08-01	76H 151095 00	POST	3	IRRIGATION	NWSESE	33	11N20	CARLTON CREEK	SCHMITZ DITCH	04/01 to 11/04	04/01 to 11/04	3	1346.4
ALLAN	JOHN	1881-06-27	76H 151096 00	POST	1	IRRIGATION	SENWNE	34	11N20	CARLTON CREEK	LOWER MACLAY DITCH	04/01 to 11/04	04/01 to 11/04	6.75	3029.4
ALLAN	JUDITH	1881-06-27	76H 151096 00	POST	1	IRRIGATION	SENWNE	34	11N20	CARLTON CREEK	LOWER MACLAY DITCH	04/01 to 11/04	04/01 to 11/04	6.75	3029.4
ALLAN	JOHN	1881-06-27	76H 151096 00	POST	2	IRRIGATION	SENESE	33	11N20	CARLTON CREEK	UPPER MACLAY DITCH	04/01 to 11/04	04/01 to 11/04	6.75	3029.4
ALLAN	JUDITH	1881-06-27	76H 151096 00	POST	2	IRRIGATION	SENESE	33	11N20	CARLTON CREEK	UPPER MACLAY DITCH	04/01 to 11/04	04/01 to 11/04	6.75	3029.4
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] to 11/04	04/01 to 11/04	6.75	3029.4
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] to 11/04	04/01 to 11/04	6.75	3029.4
ALLAN	JOHN	1890-06-10	76H 151098 00	POST	1	IRRIGATION	SENWNE	34	11N20	CARLTON CREEK	LOWER MACLAY DITCH	04/01 to 11/04	04/01 to 11/04	1.25	561
ALLAN	JUDITH	1890-06-10	76H 151098 00	POST	1	IRRIGATION	SENWNE	34	11N20	CARLTON CREEK	LOWER MACLAY DITCH	04/01 to 11/04	04/01 to 11/04	1.25	561
ALLAN	JOHN	1890-06-10	76H 151098 00	POST	2	IRRIGATION	SENESE	33	11N20	CARLTON CREEK	UPPER MACLAY DITCH	04/01 to 11/04	04/01 to 11/04	1.25	561

Owner Index

2024 Water Right Index - Carlton Creek Distribution Area

Water Right #	Owner	Owner (first)	Enf. Priority Date	Ver. Type	POD #	Use	Qtr Sect.	Sect.	Twp Rng	Source	Diversion Name	Period of Diversion	Period of Use	Cfs	Gpm
76H 651 00	SAMPLES	CHARLES	1872-07-01	ORIG	1	IRRIGATION	SWNENE	34	11N20	CARLTON CREEK	HENDRICKSON DITCH	04/01 to 09/04	04/01 to 09/04	.32	145
76H 651 00	SAMPLES	ROSALIND	1872-07-01	ORIG	1	IRRIGATION	SWNENE	34	11N20	CARLTON CREEK	HENDRICKSON DITCH	04/01 to 09/04	04/01 to 09/04	.32	145
76H 5835 00	WILLSON	JUDSON	1886-05-01	ORIG	1	IRRIGATION	SWSWSE	33	11N20	CARLTON CREEK	WILLSON-POLETTE DITCH	04/15 to 10/19	04/15 to 10/19	.17	80.78
76H 5835 00	WILLSON	GRACE	1886-05-01	ORIG	1	IRRIGATION	SWSWSE	33	11N20	CARLTON CREEK	WILLSON-POLETTE DITCH	04/15 to 10/19	04/15 to 10/19	.17	80.78
76H 5836 00	WILLSON	GRACE	1888-06-01	ORIG	1	IRRIGATION	SWSWSE	33	11N20	CARLTON CREEK	WILLSON-POLETTE DITCH	04/15 to 10/19	04/15 to 10/19	.17	80.78
76H 5836 00	WILLSON	JUDSON	1888-06-01	ORIG	1	IRRIGATION	SWSWSE	33	11N20	CARLTON CREEK	WILLSON-POLETTE DITCH	04/15 to 10/19	04/15 to 10/19	.17	80.78
76H 9068 00	OLAH	LAURENTIU	1886-05-01	POST	1	IRRIGATION	SWSWSE	33	11N20	CARLTON CREEK	WILLSON-POLETTE DITCH	05/01 to 07/31	05/01 to 07/31	.25	112.5
76H 9068 00	OLAH	CHRISTINE	1886-05-01	POST	1	IRRIGATION	SWSWSE	33	11N20	CARLTON CREEK	WILLSON-POLETTE DITCH	05/01 to 07/31	05/01 to 07/31	.25	112.5
76H 12069 00	SLATTERY	CHRISTINE	1886-05-01	POST	1	STOCK	NWSWSE	33	11N20	CARLTON CREEK	WILLSON-POLETTE DITCH	04/15 to 10/19	04/15 to 10/19		
76H 12069 00	SLATTERY	GREGORY	1886-05-01	POST	1	STOCK	NWSWSE	33	11N20	CARLTON CREEK	WILLSON-POLETTE DITCH	04/15 to 10/19	04/15 to 10/19		
76H 12070 00	SLATTERY	CHRISTINE	1886-05-01	POST	1	IRRIGATION	NWSWSE	33	11N20	CARLTON CREEK	WILLSON-POLETTE DITCH	04/15 to 10/19	04/15 to 10/19	.29	134.6
76H 12070 00	SLATTERY	GREGORY	1886-05-01	POST	1	IRRIGATION	NWSWSE	33	11N20	CARLTON CREEK	WILLSON-POLETTE DITCH	04/15 to 10/19	04/15 to 10/19	.29	134.6
76H 13303 00	KONOWICZ	ROBERT	1886-05-01	ORIG	1	IRRIGATION	SWSWSE	33	11N20	CARLTON CREEK	WILLSON-POLETTE DITCH	05/01 to 09/19	05/01 to 09/19	.25	112.5
76H 13303 00	KONOWICZ	SARA	1886-05-01	ORIG	1	IRRIGATION	SWSWSE	33	11N20	CARLTON CREEK	WILLSON-POLETTE DITCH	05/01 to 09/19	05/01 to 09/19	.25	112.5
76H 13303 00	KONOWICZ	CARRIE	1886-05-01	ORIG	1	IRRIGATION	SWSWSE	33	11N20	CARLTON CREEK	WILLSON-POLETTE DITCH	05/01 to 09/19	05/01 to 09/19	.25	112.5
76H 13303 00	HAYES, FREDRICK & DEBRA LIVING TRUST MAY 14, 2020		1886-05-01	ORIG	1	IRRIGATION	SWSWSE	33	11N20	CARLTON CREEK	WILLSON-POLETTE DITCH	05/01 to 09/19	05/01 to 09/19	.25	112.5
76H 13303 00	KONOWICZ	DEANNE	1886-05-01	ORIG	1	IRRIGATION	SWSWSE	33	11N20	CARLTON CREEK	WILLSON-POLETTE DITCH	05/01 to 09/19	05/01 to 09/19	.25	112.5
76H 13304 00	KONOWICZ	ROBERT	1888-06-01	ORIG	1	IRRIGATION	SWSWSE	33	11N20	CARLTON CREEK	WILLSON-POLETTE DITCH	05/01 to 09/19	05/01 to 09/19	.25	112.5
76H 13304 00	KONOWICZ	CARRIE	1888-06-01	ORIG	1	IRRIGATION	SWSWSE	33	11N20	CARLTON CREEK	WILLSON-POLETTE DITCH	05/01 to 09/19	05/01 to 09/19	.25	112.5
												1 to 09/19	05/01 to 09/19	.25	112.5
												1 to 09/19	05/01 to 09/19	.25	112.5
												1 to 09/19	05/01 to 09/19	.25	112.5
76H 21150 00	FORTIER	JOSEPH	1883-05-31	ORIG	1	IRRIGATION	SENWNE	34	11N20	CARLTON CREEK	UPPER WALKER DITCH	04/15 to 10/19	04/15 to 10/19	.17	76.3
76H 21150 00	JOHNSON	SARAH	1883-05-31	ORIG	1	IRRIGATION	SENWNE	34	11N20	CARLTON CREEK	UPPER WALKER DITCH	04/15 to 10/19	04/15 to 10/19	.17	76.3

Water Right Index

Questions?

QUESTION FOR A PRIZE!

TRUE OR FALSE

A water user can divert water from anywhere along their land if they have a water right from that source.

AVAILABLE TOOLS & RESOURCES

QUESTION FOR A PRIZE!

Where can water commissioners access water right files?

Break

MEASUREMENT TOOLS & TECHNIQUES

Streamflow Measurement

Definitions

- **Discharge** – flow rate of water in stream
- **Stage** – height of water above a fixed point
- **Rating** – relationship between stage and discharge
- **Reach** – section of a stream between two points

Streamflow Measurement

Discharge Units

Q = Flow Rate or the volume of water passing a point per unit of time

cfs – cubic ft per second

gpm – gallons per minute

acft/day – acre ft per day

MI– miner's inches (MT)

Streamflow Measurement

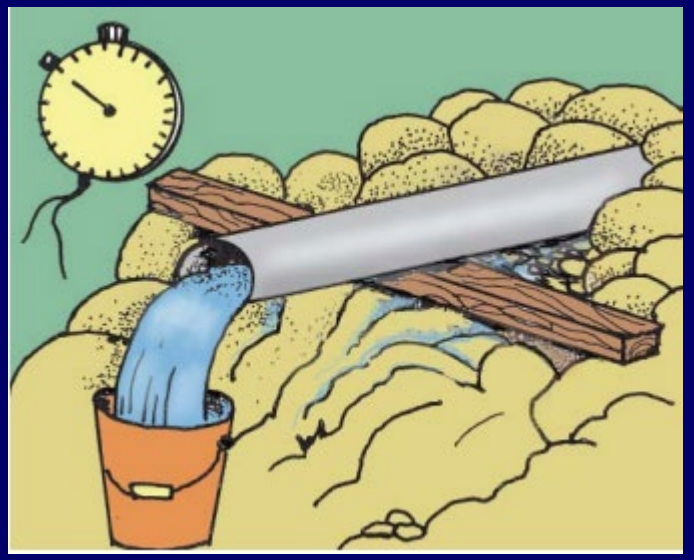
Bucket Method

Q = Volume / Rate

Record time it takes to fill a container of known size

Repeat minimum of 3 times and average results

What is the discharge if it took 15s, 18s, & 14s to fill a 5-gal bucket?



Average Time : (15 + 18 +14) /3 = 15.7 s

Convert to Min: 15.7s / 60s = 0.26 min

Discharge: 5gal / 0.26 min = 19.2 gpm

Streamflow Measurement

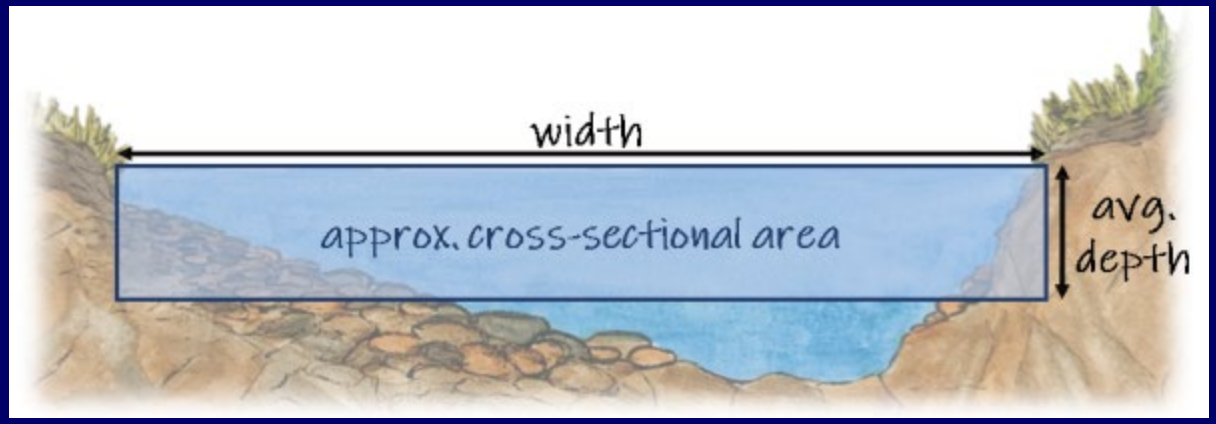
Discharge

Flow Rate or the volume of water passing a point per unit of time

Discharge = Cross Sectional Area × Velocity

Q = AV

Area = Depth × Width



2 ft deep × 30 ft wide = 60 ft^2

60 ft^2 × 2 ft/s = 120 ft^3/s or 120 cfs

Streamflow Measurement

Float-Area Method

$Q = Area_{ave} \times Velocity_{ave}$

Stream is 10 ft wide and I took three depths along the cross section reading 1.5 ft, 2.2 ft, and 0.8ft. It took 23 seconds for my float to travel 50ft. What is the Discharge?

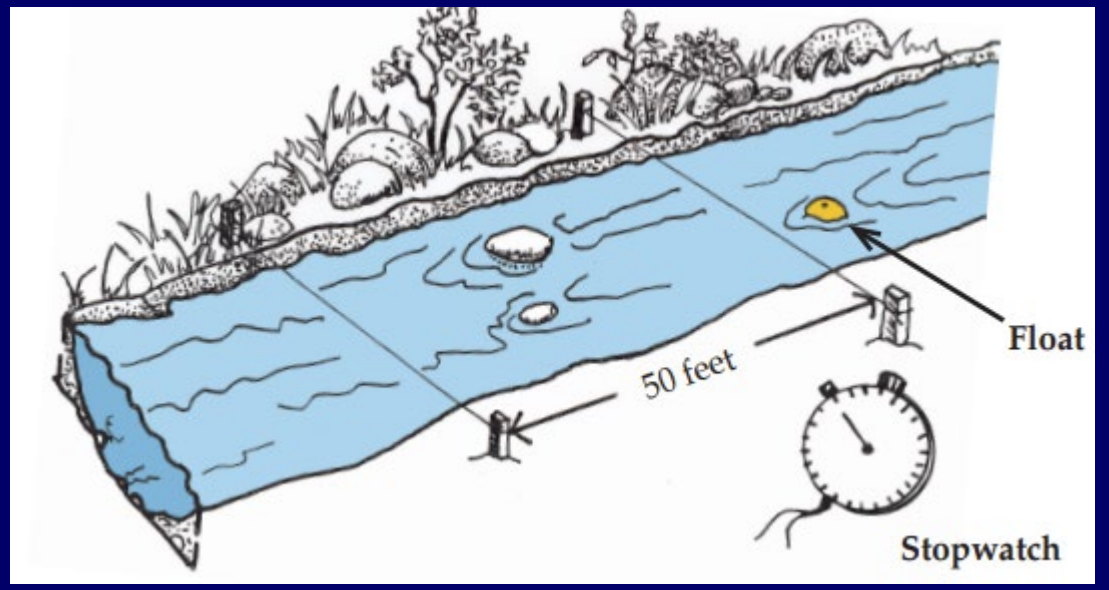
Ave depth: (1.5 + 2.2 + 0.8) / 3 = 1.5 ft

Area: 10 ft × 1.5 ft = 15 ft^2

Surface Velocity: 50 ft / 23 s = 2.17 ft/s

Ave Velocity: 2.17ft/s × 0.8 = 1.74ft/s

Discharge: 15 ft^2 × 1.45ft/s = 26.1 cfs



Streamflow Measurement

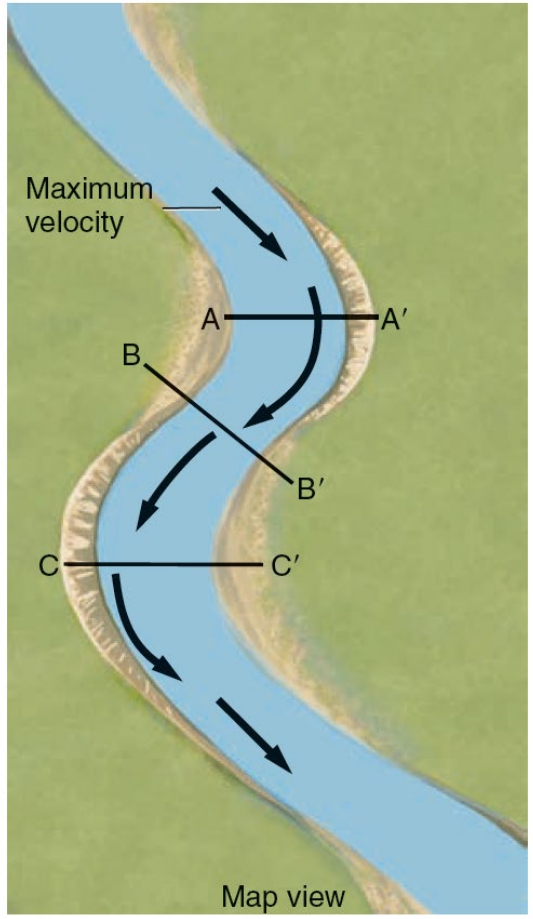
Discharge

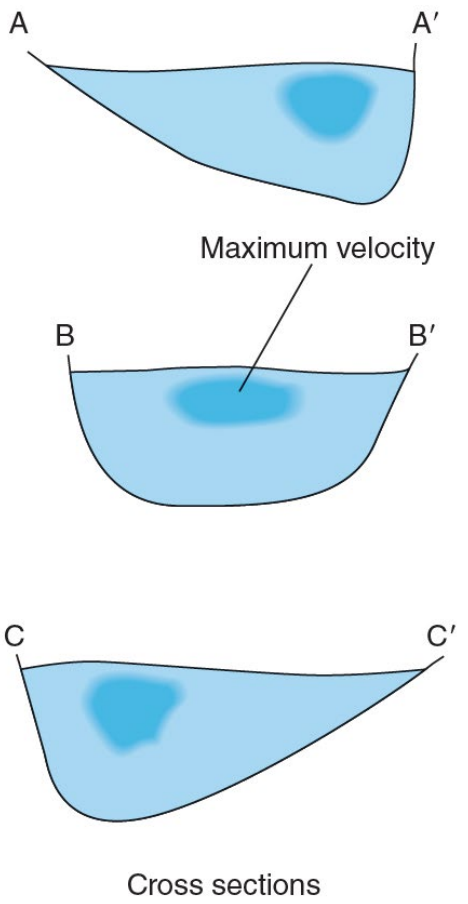
Stream velocity isn't uniform!

Changes along a cross section with:

- stream sinuosity
- vegetation
- bed material
- obstructions
- slope
- depth
- etc.

Qtotal = A1V1 + A2V2 + A3V3 +…+AnVn





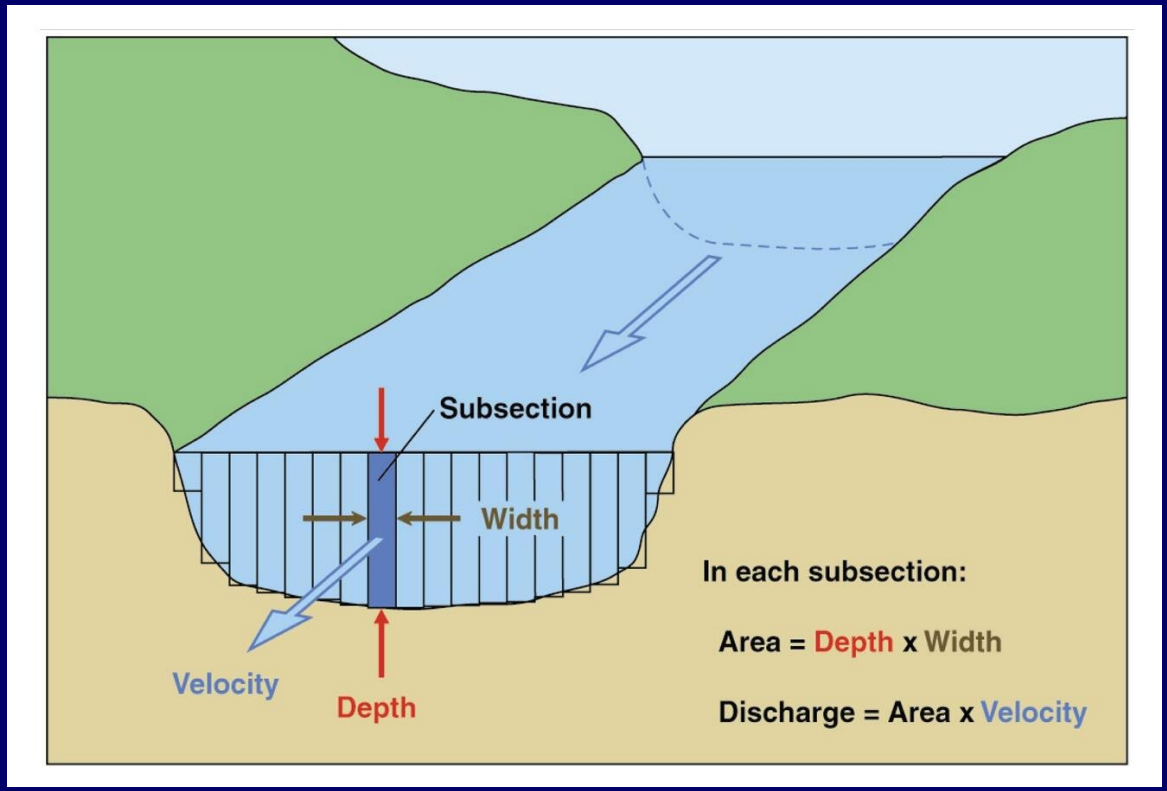
Streamflow Measurement

Velocity-Area Method

$Q_{total} = A_1V_1 + A_2V_2 + A_3V_3 + \ldots + A_nV_n$

Equipment Needed:

- Tagline/ tape measure
- Current meter
- Rod to measure depth
- Notepad



Streamflow Measurement

Current Meters

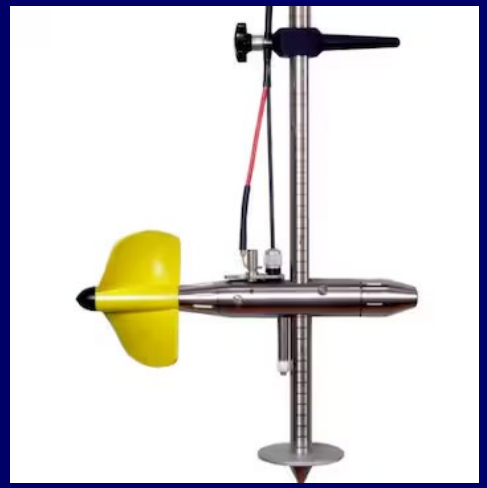
Types:

- Mechanical
- Electromagnetic
- Acoustic Doppler

Streamflow Measurement

Current Meters – Mechanical

- Propeller or cups
- Calibrated to convert rpm to velocity
- Very accurate
- Can’t measure very low flow
- Moving parts means wear and tear



Streamflow Measurement

Current Meters – Electromagnetic

- Water moving through a magnetic field produces an electric current
- Converts strength of electric current (voltage) to velocity
- Maintenance free (no moving parts)
- Can measure low flow
- Less accurate (especially in low flow)
- Expensive

Streamflow Measurement

Current Meters – Acoustic Doppler Velocimeter

- Records the frequency change of sound waves reflecting off particles in stream flow (doppler effect)
- Maintenance Free (no moving parts)
- Can measure low flow
- Very accurate
- Boundary interference and clear water
- Very Expensive

Streamflow Measurement

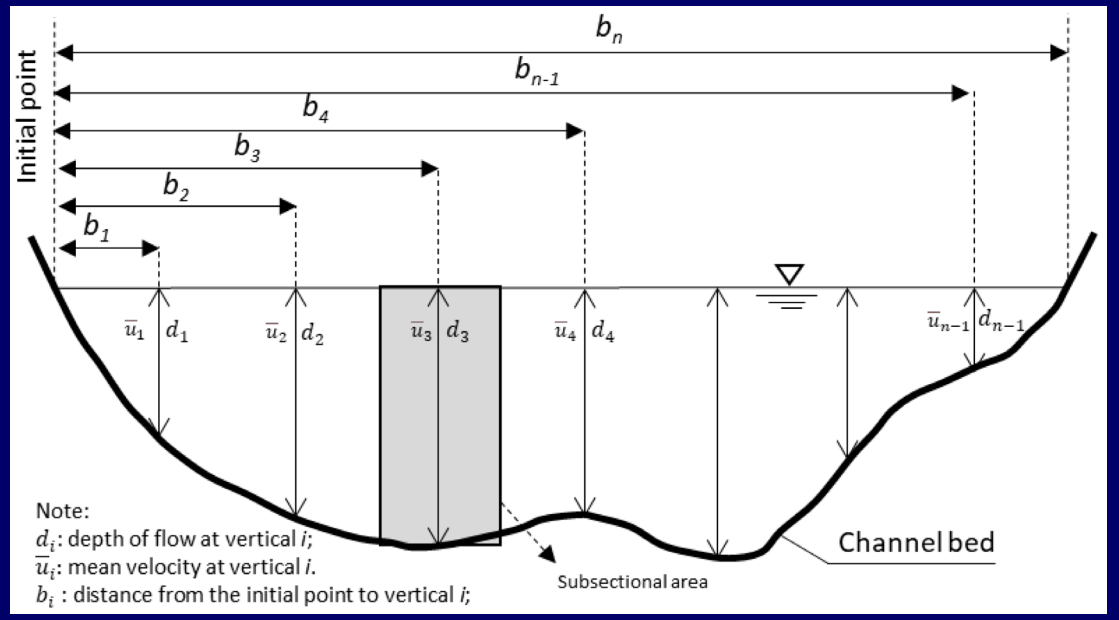
Site Selection

- Straight Reach
- Parallel Flow Lines (no turbulence or eddies)
- Boulder, Debris, and Vegetation Free
- Close to Gaging Station (if applicable)
- Velocity >0.25 ft/s, Depth >0.25 ft is ideal

Streamflow Measurement

Number of Measurements

- No single section shall have > 10% of flow
- 25 – 30 measurements with <5% of flow per section is ideal
- Sections don't have to be the same size!
- You can always re-measure and break up sections



If my x-section is 24 ft wide, how wide should I made each section?

Where is my 1st measurement?

Streamflow Measurement

Where to record velocity

Six-Tenths-Depth:

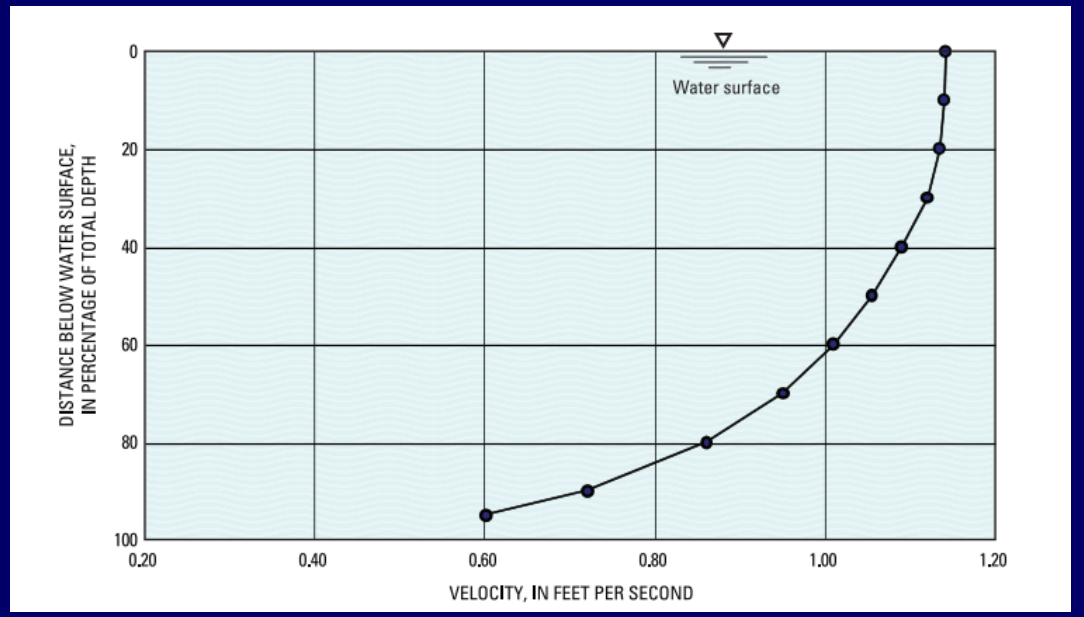
- Take measurement at 0.6 depth
- Depths ≤1.5 ft

Two-Point Method:

- Average measurements at 0.2 and 0.8 depth
- Depths >1.5 ft

Three-Point Method:

- Average measurements at 0.2 and 0.8 depth
- Average prior with 0.6 depth
- Depths >1.5 ft & irregular velocities (if 0.2 is > 2x 0.8)



Streamflow Measurement

Recording Velocity

- Measure in 40 second intervals
- Keep neat notes!
- Take recordings after each measurement
- Calculate in field to ensure <10% flow per section
- Waterproof notebooks are nice

FIGURE 22
Estimating the flow in a stream from measurement with a current meter. The calculations for this example are shown in Table 2.

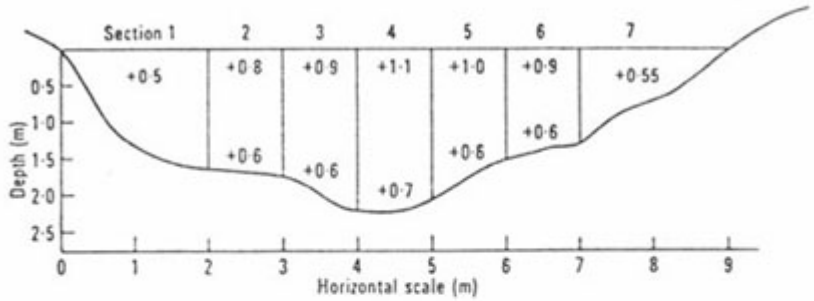


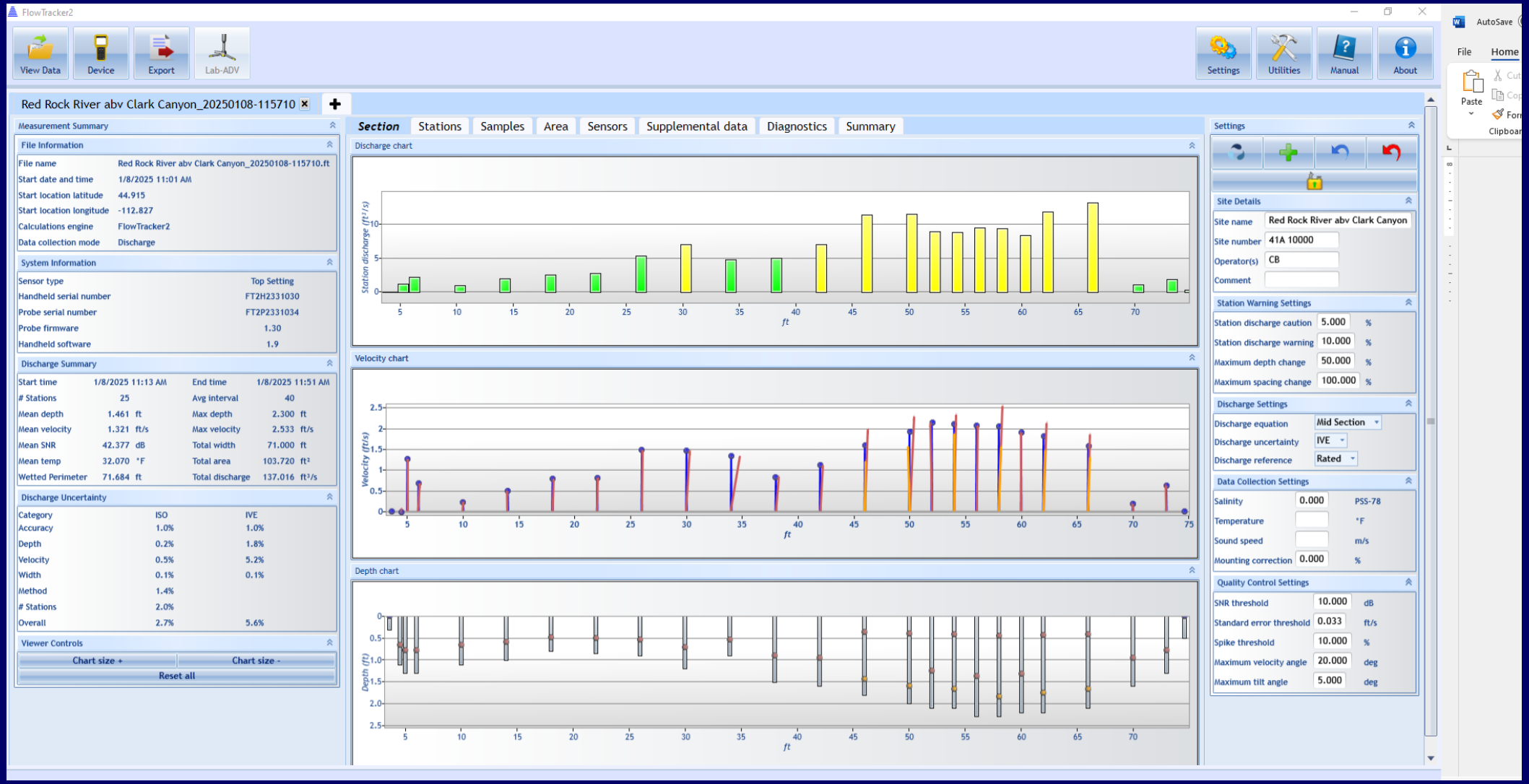
TABLE 2
Calculation of steamflow from current meter readings

1	2	3	4	5	6	7	8
Section	Flow velocity (m/s)			Depth (m)	Width (m)	Area (m^2) 5 x 6	Flow (m^3/s) 4 x 7
	0.2D	0.8D	Mean				
1	-	-	0.5	1.3	2.0	2.6	1.30
2	0.8	0.6	0.7	1.7	1.0	1.7	1.19
3	0.9	0.6	0.75	2.0	1.0	2.0	1.50
4	1.1	0.7	0.9	2.2	1.0	2.2	1.98
5	1.0	0.6	0.8	1.8	1.0	1.8	1.44
6	0.9	0.6	0.75	1.4	1.0	1.4	1.05
7	-	-	0.55	0.7	2.0	1.4	0.77
						TOTAL	9.23

D is the depth of the stream at the mid-point of each section.

Streamflow Measurement

FlowTracker2



Streamflow Measurement

Questions on Velocity-Area Method?

Streamflow Measurement Devices

"Suitable Measuring Device"

ARM 36.13.101(9)

"Suitable controlling device" means a headgate or other adjustable structure to regulate the amount of water diverted from a watercourse. The suitable controlling device must be capable of being closed completely and to adequately vary the amount of water diverted into a ditch, canal, pipeline or other conveyance system.

ARM 36.13.101(10)

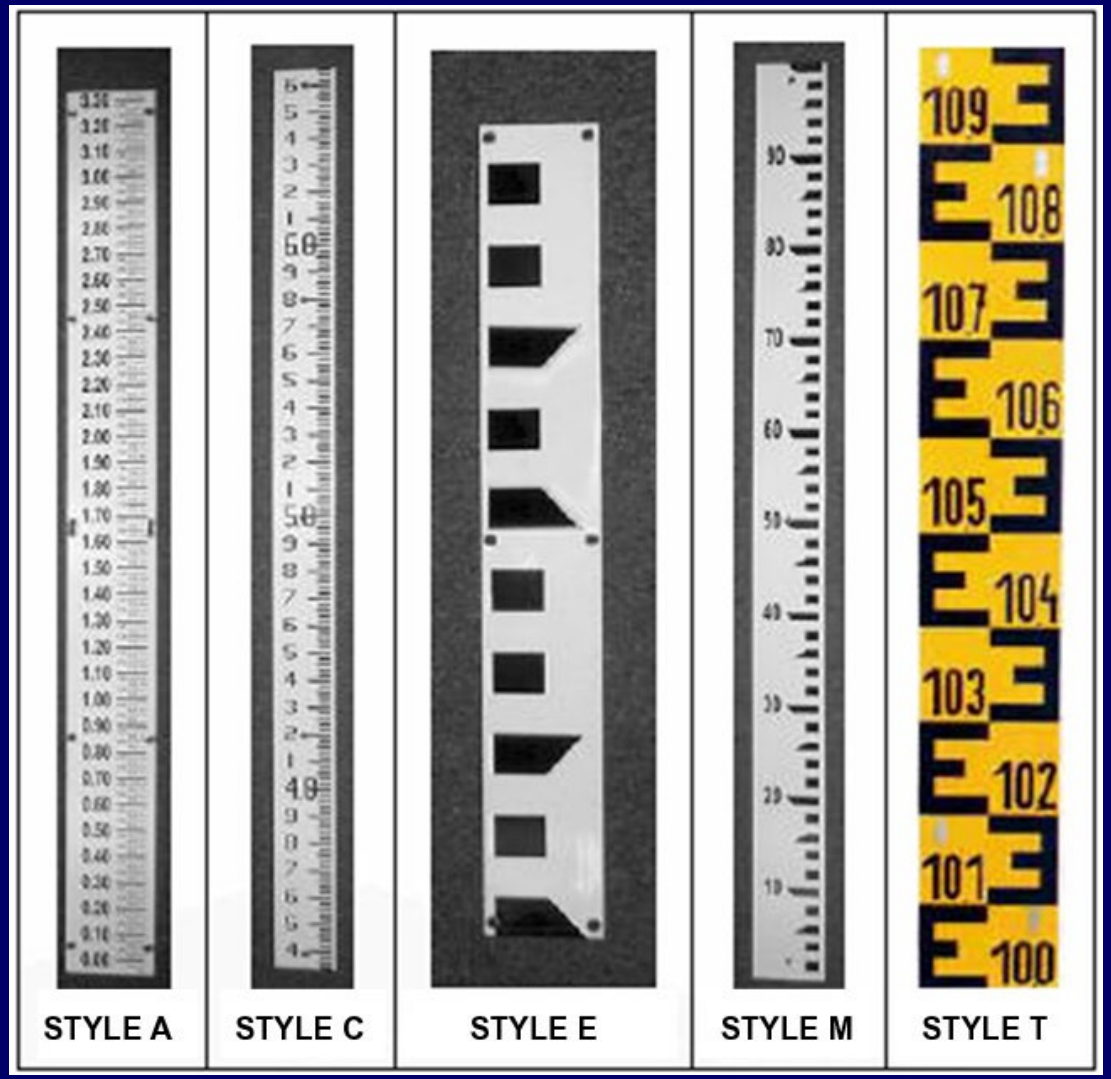
"Suitable measuring device" means a structure, gauging station or meter that determines the amount of water being diverted into an appropriation facility. The suitable measuring device may be integrated and be a part of a suitable controlling device or it may be separate. Plans and/or specifications of measuring devices must be approved by the department prior to installation. The suitable measuring device must be capable of measuring one hundred twenty five per cent (125%) of the flow rate of the appropriative or reserved water right. The measuring device must be located as close as is reasonably possible to the point of diversion from the watercourse.

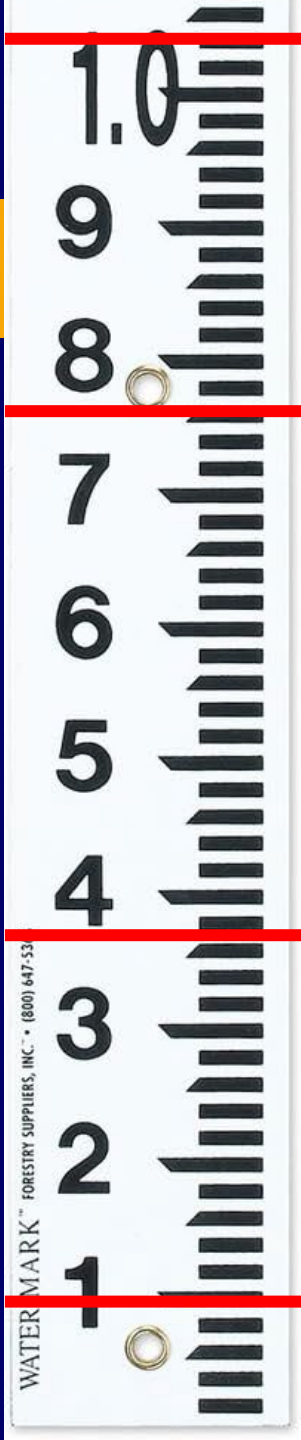
Staff Gages, Flumes, Weirs, In-line meters, Pressure Transducers, etc.

Streamflow Measurement Devices

Staff Gages

- Ruler used to measure water surface elevation
- Can be used with a rating or structure to determine discharge
- Datum must be below zero flow
- Must be easily viewable and accessible

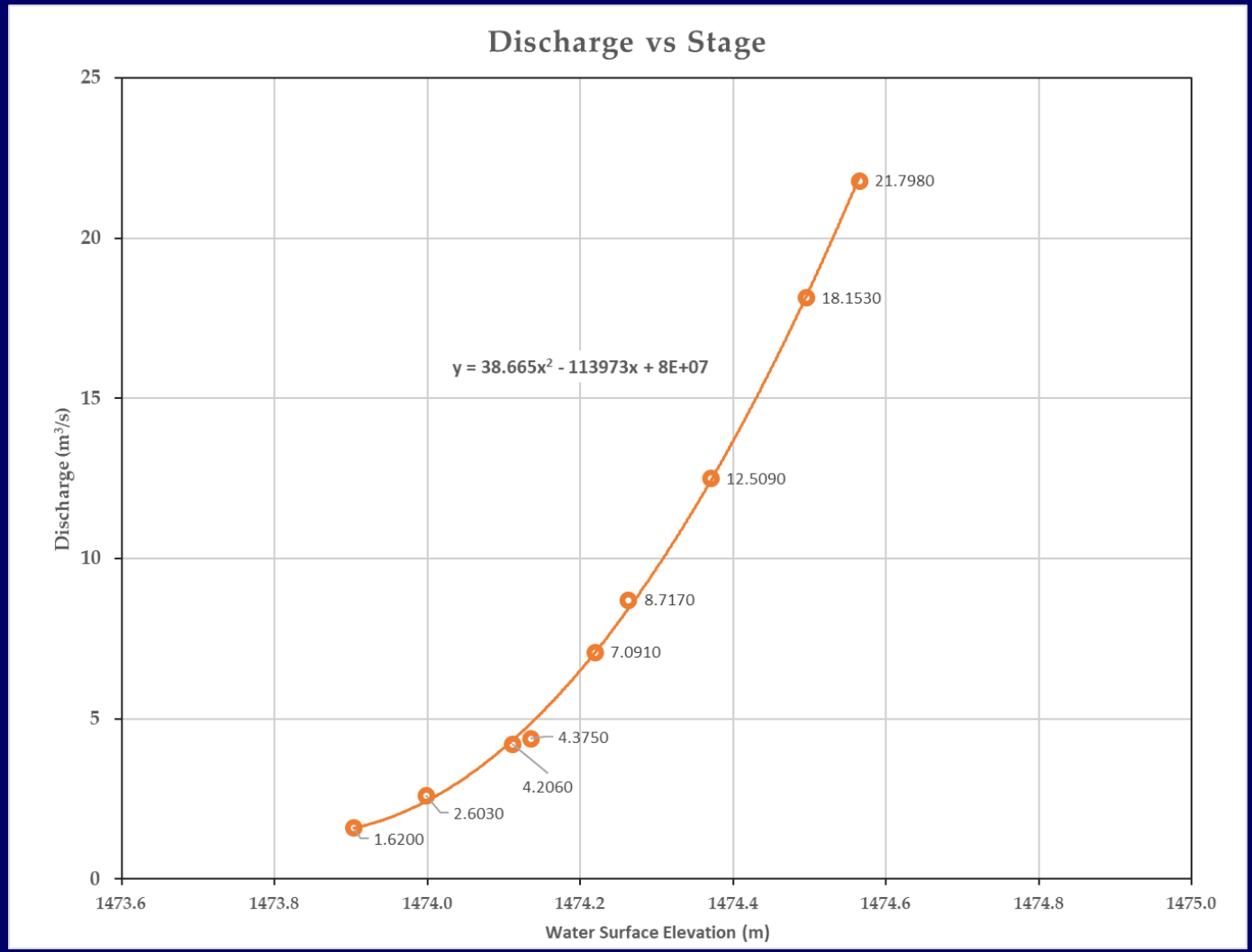




Streamflow Measurement Devices

Building a Rating

- A rating can be built from discharge measurements in the same location
- Nearby staff gage reading is taken
- Needs to be periodically verified
- Will need to be rebuilt after channel conditions change



Streamflow Measurement Devices

Flumes

- Parshall
- Montana
- Cutthroat
- Ramp
- H
- Trapezoidal
- Palmer-Bowlus

- Need to ID proper flume type
- Verify correctly installed and located
- Verify it is functioning properly
- Know how to determine discharge

Streamflow Measurement Devices

Parshall Flumes

- Most Common
- Very Accurate under a wide range of flow
- Have drop in throat
- Can measure flow when submerged
- Good at passing sediment
- Difficult to install in flat ditches
- Can create more upstream head
- Expensive

Streamflow Measurement Devices

Montana Flumes (Short Parshall)

- Does Not have extended throat or diverging section
- Can Not measure flow when submerged
- Good at passing sediment
- Good in flat ditches
- Easy to install
- Low head loss
- Cheap

Streamflow Measurement Devices

Cutthroat Flumes

- Flat Bottom
- Can be used in variable conditions
- Difficult to measure flow when submerged
- Not as good at passing sediment
- Easy to install in flat ditches
- Low head loss
- Cheap

Streamflow Measurement Devices

Ramp Flumes (Broad Crested Weir)

- No throat
- Good at passing larger debris
- Good for flat ditches
- More Customizable
- Low head loss
- Cheapest (usually)

Streamflow Measurement Devices

Flume Location

"The measuring device must be located as close as is reasonably possible to the point of diversion from the watercourse"

- Can't be too close to headgate
- (will back up water above gate)

- Can't be too far downstream
  - (inputs, diversions, ability to read)

- Downstream structures can't backup water

- Needs calm straight section of channel

Streamflow Measurement Devices

Flume Location

"The measuring device must be located as close as is reasonably possible to the point of diversion from the watercourse"

- Can't be too close to headgate
- (will back up water above gate)

- Can't be too far downstream
  - (inputs, diversions, ability to read)

- Downstream structures can't backup water

- Needs calm straight section of channel

Streamflow Measurement Devices

Flume Installation

- Straight Section of Ditch
- Clear of obstructions and structures
- Cutt-off wall (no leaks!)
- Level (both directions)
- Floor needs to be above the ditch bottom
- Floor needs to be below the bottom of headgate
- Staff gage set on floor of flume and 2/3 from crest

Streamflow Measurement Devices

Flume Installation

- Straight Section of Ditch
- Clear of obstructions and structures
- Cutt-off wall (no leaks!)
- Level (both directions)
- Floor needs to be above the ditch bottom
- Floor needs to be below the bottom of headgate
- Staff gage set on floor of flume and 2/3 from throat

Streamflow Measurement Devices

Flume Flow Measurement

- Measure throat width of flume
- Ensure free flow
- Record upper gage
- Check table

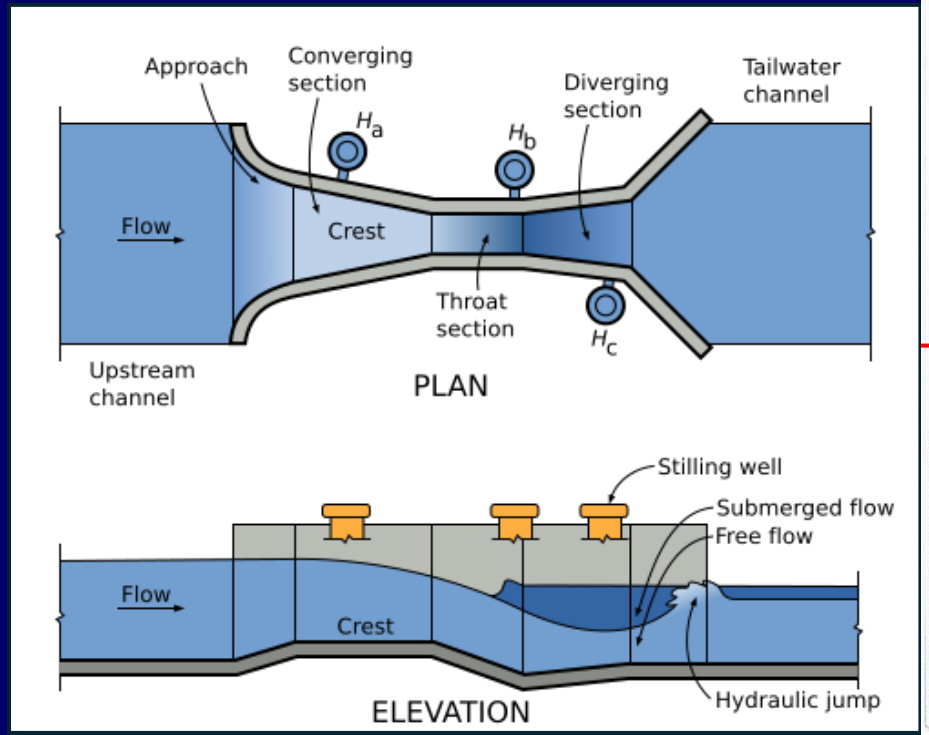


Table A8-12. Free-flow discharges in ft^3/sec through 1- to 8-foot Parshall flumes. Discharges for 2- to 8-ft flumes computed from the formula $Q = 4.00 W h_a^{1.522(W^{0.026})}$. Discharges for 1-ft flume computed from the formula $Q = 3.95 h_a^{1.55}$.

Upper Head h_a, ft	Discharge for flumes of various throat widths, W							
	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
0.20	0.33	0.66	0.96	1.26	-----	-----	-----	-----
.21	.35	.71	1.04	1.36	-----	-----	-----	-----
.22	.38	.77	1.12	1.47	-----	-----	-----	-----
.23	.40	.82	1.20	1.57	-----	-----	-----	-----
.24	.43	.88	1.28	1.68	-----	-----	-----	-----
.25	.46	.93	1.37	1.80	2.22	2.63	-----	-----
.26	.49	.99	1.46	1.91	2.36	2.80	-----	-----
.27	.52	1.05	1.54	2.03	2.50	2.97	-----	-----
.28	.55	1.11	1.63	2.15	2.65	3.15	-----	-----
.29	.58	1.17	1.73	2.27	2.80	3.33	-----	-----
.30	.61	1.24	1.82	2.39	2.96	3.52	4.07	4.63
.31	.64	1.30	1.92	2.52	3.12	3.71	4.29	4.88
.32	.68	1.37	2.01	2.65	3.28	3.90	4.52	5.13
.33	.71	1.44	2.11	2.78	3.44	4.10	4.75	5.39
.34	.74	1.50	2.22	2.92	3.61	4.30	4.98	5.66
.35	.78	1.57	2.32	3.05	3.78	4.50	5.21	5.92
.36	.81	1.64	2.42	3.19	3.95	4.71	5.46	6.20
.37	.85	1.71	2.53	3.33	4.13	4.92	5.70	6.48
.38	.88	1.79	2.64	3.48	4.31	5.13	5.95	6.76
.39	.92	1.86	2.75	3.62	4.49	5.35	6.20	7.05
.40	.95	1.93	2.86	3.77	4.67	5.57	6.46	7.34
.41	.99	2.01	2.97	3.92	4.86	5.79	6.72	7.64
.42	1.03	2.09	3.08	4.07	5.05	6.02	6.98	7.94
.43	1.07	2.16	3.20	4.22	5.24	6.25	7.25	8.25
.44	1.11	2.24	3.32	4.38	5.43	6.48	7.52	8.56
.45	1.15	2.32	3.44	4.54	5.63	6.72	7.80	8.87
.46	1.19	2.40	3.56	4.70	5.83	6.96	8.08	9.19
.47	1.23	2.48	3.68	4.86	6.03	7.20	8.36	9.51
.48	1.27	2.57	3.80	5.03	6.24	7.45	8.65	9.84
.49	1.31	2.65	3.93	5.19	6.45	7.69	8.94	10.2
.50	1.35	2.73	4.05	5.36	6.66	7.95	9.23	10.5
.51	1.39	2.82	4.18	5.53	6.87	8.20	9.53	10.8
.52	1.43	2.90	4.31	5.70	7.08	8.46	9.83	11.2
.53	1.48	2.99	4.44	5.88	7.30	8.72	10.1	11.5
.54	1.52	3.08	4.57	6.05	7.52	8.98	10.4	11.9
.55	1.56	3.17	4.71	6.23	7.74	9.25	10.8	12.2
.56	1.61	3.26	4.84	6.41	7.97	9.52	11.1	12.6
.57	1.65	3.35	4.98	6.59	8.20	9.79	11.4	13.0
.58	1.70	3.44	5.11	6.77	8.43	10.1	11.7	13.3
.59	1.74	3.53	5.25	6.96	8.66	10.3	12.0	13.7

Streamflow Measurement Devices

Submerged Flow

- Caused by water backing up in flume
  - Flume may be set too low
  - May be downstream restriction
    - Debris
    - Vegetation
    - Sediment
    - Structures
- Harder or impossible to measure flow accurately (depending on flume type)
- Submergence can happen at any flow rate

Streamflow Measurement Devices

Submerged Flow

3 ft Parshall flume (Ha = 0.8 ft, Q = 8.46 cfs)

Ha = 0.8 ft
Hb = 0.6 ft
Hb/Ha = 0.75 × 100
Hb/Ha = 75%

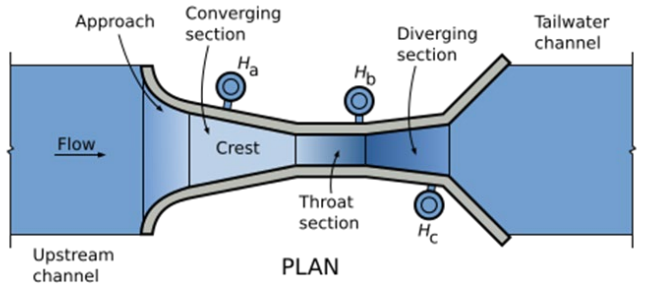


Table 3: Transition submergences in Parshall flumes.

Flume Size	Transition Submergence (H_b/H_a)	Flume Size	Transition Submergence (H_b/H_a)	Flume Size	Transition Submergence (H_b/H_a)
3"	56%	18"	64%	4'	70%
6"	56%	24"	66%	5'	72%
9"	60%	30"	67%	6'	74%
12"	62%	3'	68%	7'	76%
				8'	78%
				10' to 25'	80%

If the H_b/H_a ratio is less than shown in Table 3, there is free flow through the flume and Table 8 (p. 36-49) can be used to determine discharge.

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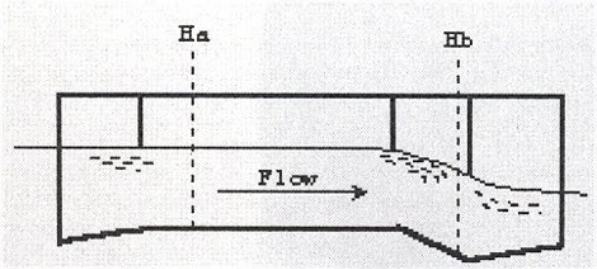


Figure 1

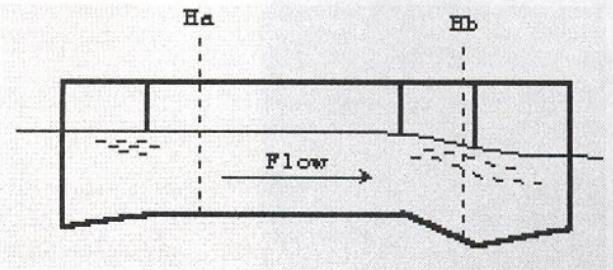


Figure 2

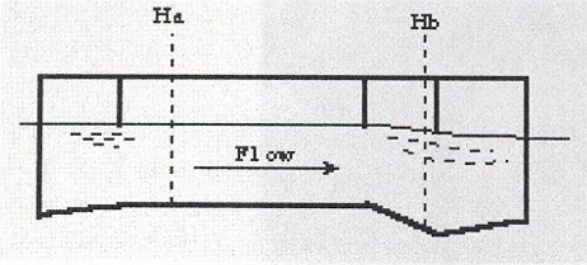


Figure 3

Streamflow Measurement Devices

Submerged Flow

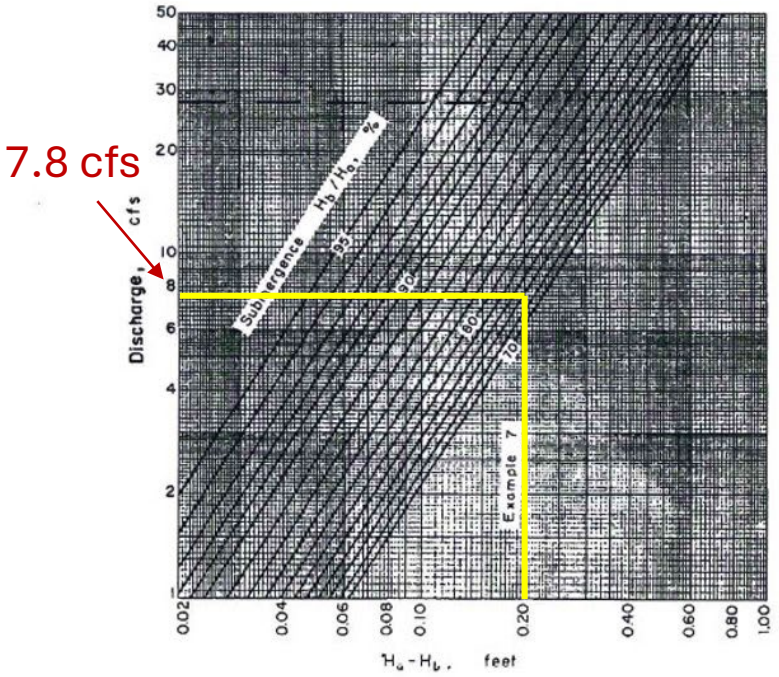
3 ft Parshall flume (Ha = 0.8 ft, Q = 8.46 cfs)

Ha = 0.8 ft
Hb = 0.6 ft
Hb/Ha = 0.75 × 100
Hb/Ha = 75%

(Ha – Hb)
0.8 – 0.6 = 0.2

Adjusted Q = 7.8 cfs

Figure 22. Submerged flow calibration curves for 3 foot Parshall Flume.



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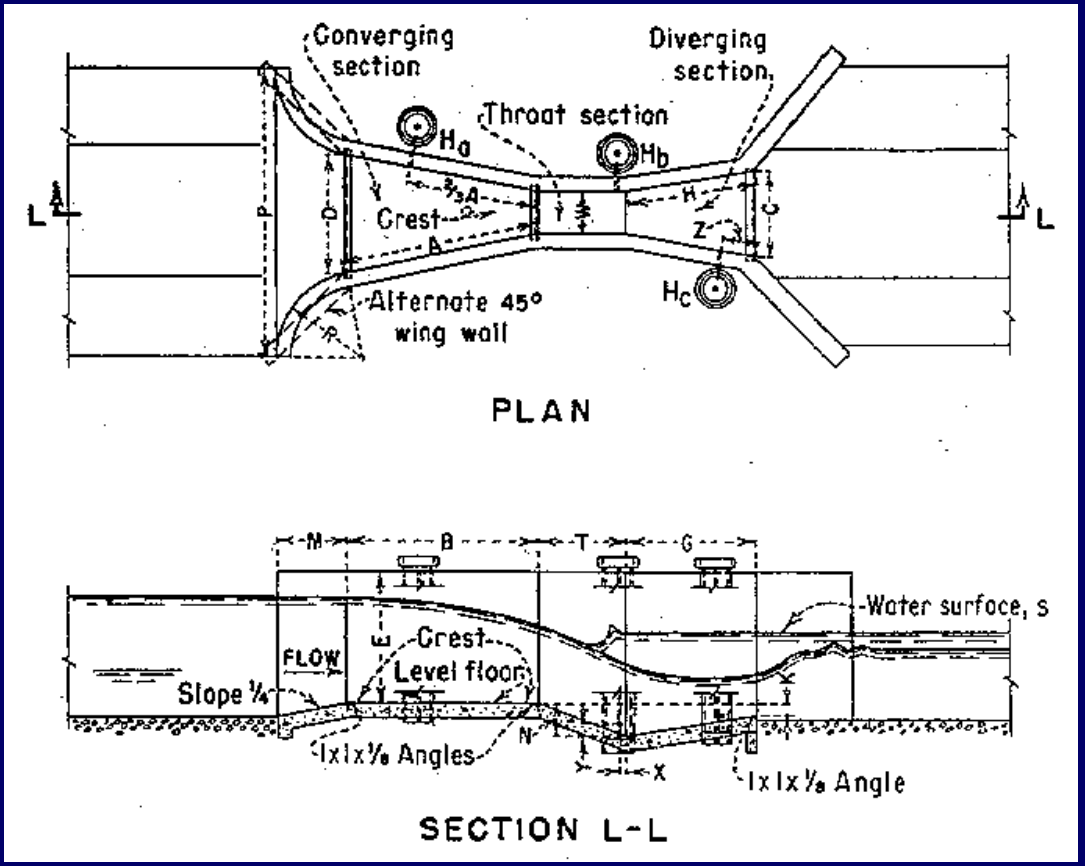
Streamflow Measurement Devices

Flume Inspection

Short Flume Video



Streamflow Measurement Devices

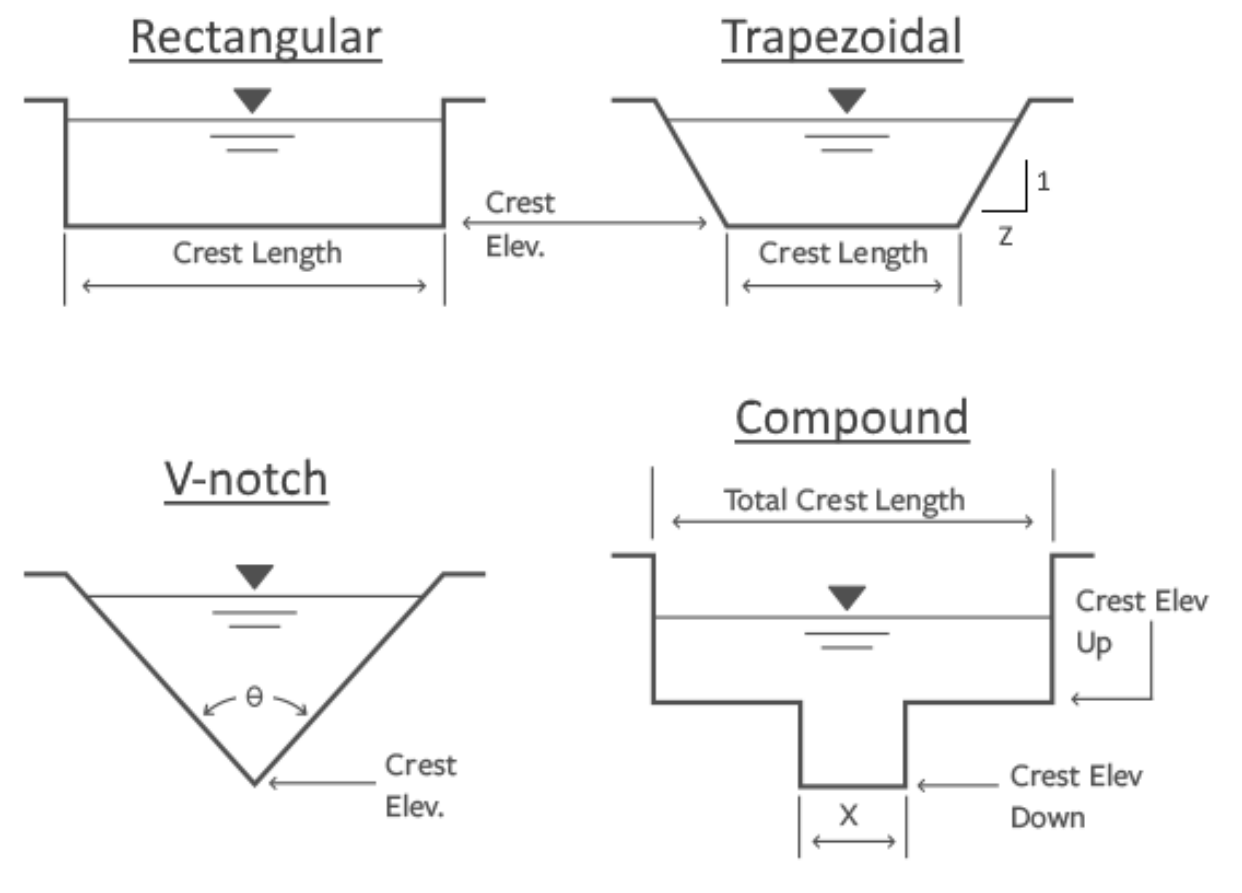
Weir styles

- More significant head loss requirement
- Approach velocity requirement
- Easier to build/ install
- Will collect sediment/ debris
- Types:
  - Rectangular
  - Cipolletti (trapezoidal)
  - V-notch
  - Compound
  - Suppressed vs contracted
  - Sharp crested vs broad crested

Streamflow Measurement Devices

Weir Shapes

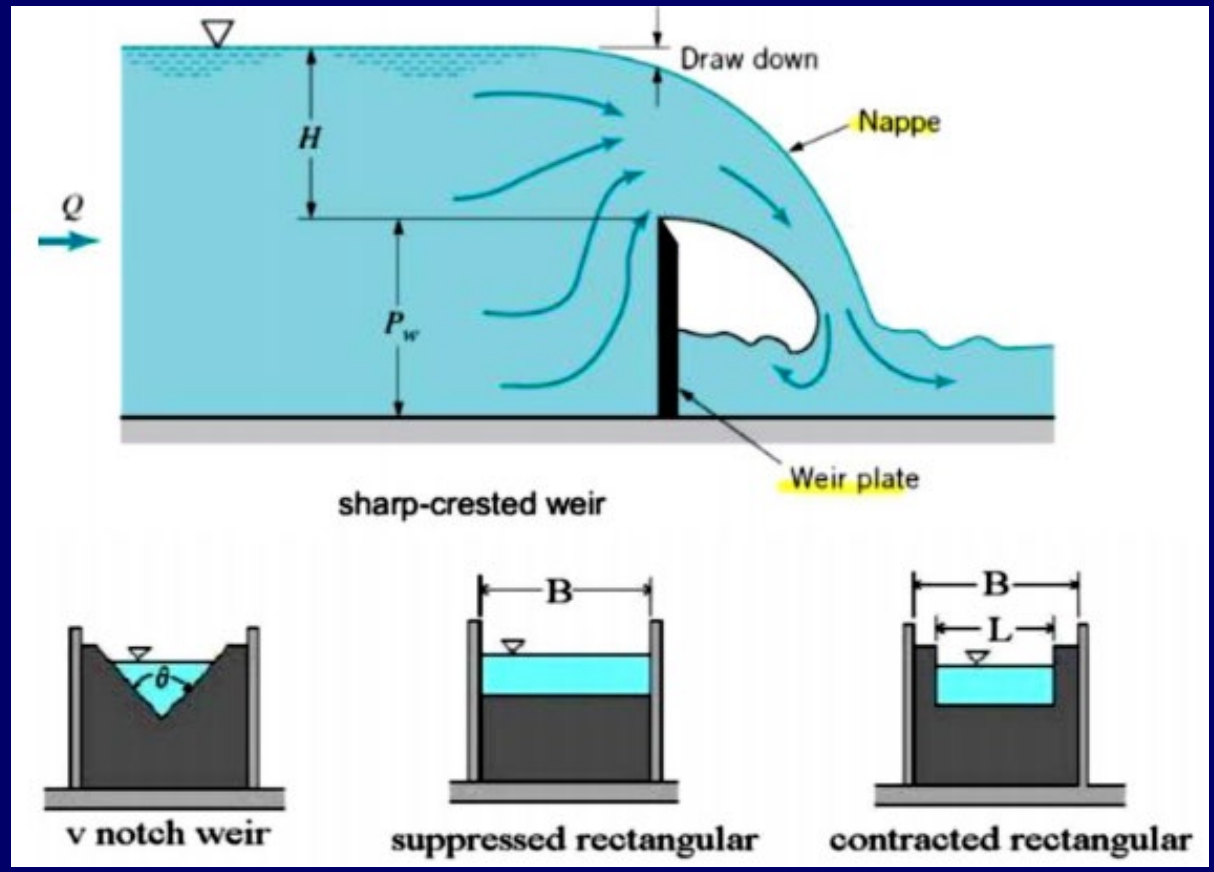
- Cipolletti weirs have sides with a slope of 1:4 (horizontal:vertical)
- V-notch weirs typically have an angle of 90°
- Compound weird could be any combination of the three types



Streamflow Measurement Devices

Weir Types

- Sharp Crested Weirs
  - Must have Ventilated Nappe
  - Typically have metal plate along crest
- Broad Crested Weirs
  - Must have hydraulic jump
  - Think ramp flume
  -
- Suppressed vs Contracted
  - Suppressed weirs span the entire channel
  - Contracted is most common



Streamflow Measurement Devices

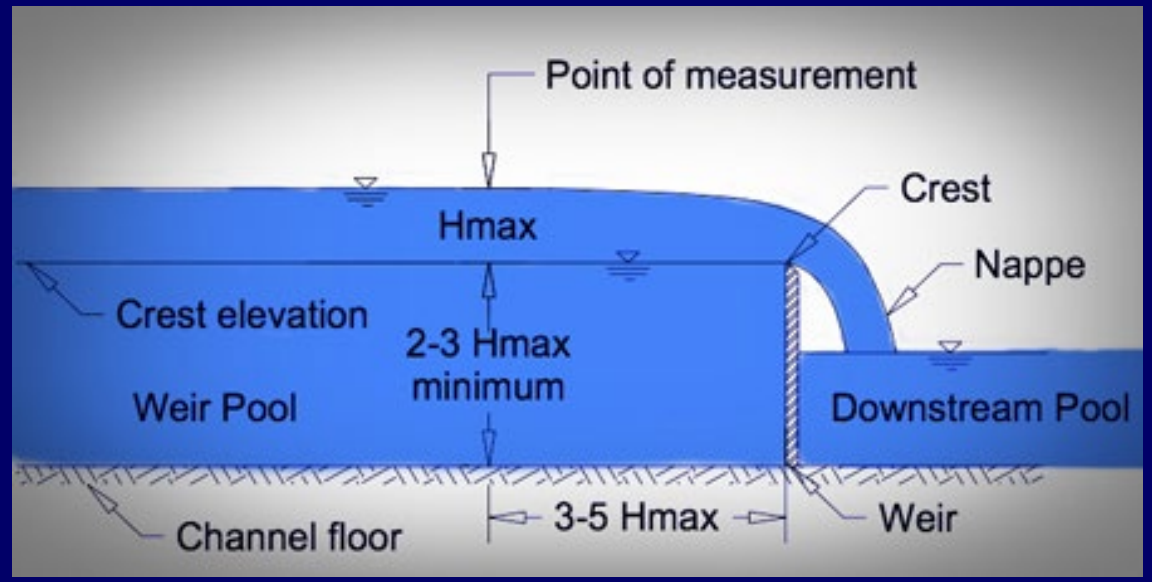
Weir Shapes

Contracted Sharp-Crested Rectangular Weir

Streamflow Measurement Devices

Weir Installation

- Straight section of channel
- Does not back up water above headgate
- Level & plumb
- Crest must be clear of debris and undamaged
- Calm low velocity approach flow (15-20x H_{max})
- Free flow over weir
- Staff gage must be 3-5x H_{max} & level with weir crest



Streamflow Measurement Devices

Weir Installation

- Straight section of channel
- Does not back up water above headgate
- Level & plumb
- Crest must be clear of debris and undamaged
- Calm low velocity approach flow (15-20x H_{max})
- Free flow over weir
- Staff gage must be 3-5x H_{max} & level with weir crest

Streamflow Measurement Devices

Weir Installation

- Straight section of channel
- Does not back up water above headgate
- Level & plumb
- Crest must be clear of debris and undamaged
- Calm low velocity approach flow (15-20x H_{max})
- Free flow over weir (min 2in)
- Staff gage must be 3-5x H_{max} & level with weir crest

Streamflow Measurement Devices

Weir Installation

- Straight section of channel
- Does not back up water above headgate
- Level & plumb
- Crest must be clear of debris and undamaged
- Calm low velocity approach flow (15-20x H_{max})
- Free flow over weir
- Staff gage must be 3-5x H_{max} & level with weir crest

Streamflow Measurement Devices

Weir Measurement

- Record crest length of weir (or notch angle)
- Record height of water above crest in pool

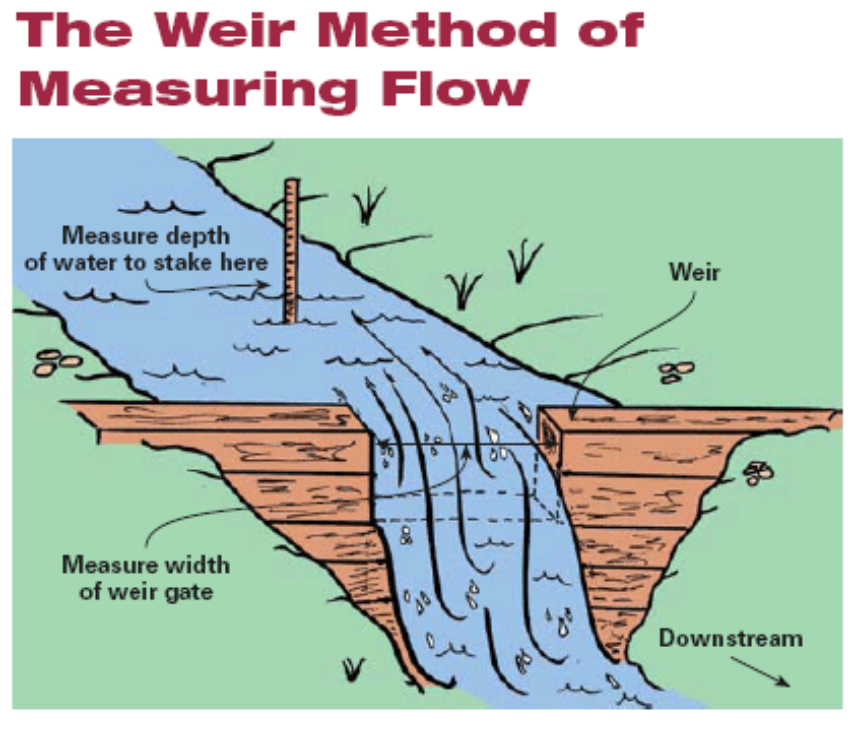


TABLE 5: CIPOLLETTI WEIRS

Head, in feet	Free flow in cubic feet per second (cfs) over various crest lengths					For each additional foot of cres in excess of 4 feet
	1.0 feet	1.5 feet	2.0 feet	3.0 feet	4.0 feet	
.50	1.22	1.79	2.37	3.53	4.69	1.16
.51	1.26	1.85	2.44	3.64	4.83	1.20
.52	1.30	1.90	2.51	3.74	4.97	1.23
.53	1.34	1.96	2.59	3.85	5.12	1.27
.54	1.38	2.02	2.66	3.96	5.26	1.30
.55	1.42	2.07	2.74	4.07	5.41	1.34
.56	1.46	2.13	2.81	4.18	5.56	1.38
.57	1.50	2.19	2.89	4.30	5.71	1.41
.58	1.54	2.25	2.97	4.41	5.86	1.45
.59	1.58	2.31	3.05	4.53	6.01	1.49
.60	1.62	2.37	3.13	4.64	6.17	1.52
.61	1.67	2.43	3.20	4.76	6.32	1.56
.62	1.71	2.49	3.29	4.88	6.48	1.60
.63	1.75	2.56	3.37	5.00	6.63	1.64
.64	1.80	2.62	3.45	5.12	6.79	1.68
.65	1.84	2.68	3.53	5.24	6.95	1.71
.66	1.89	2.75	3.61	5.36	7.11	1.75
.67	1.93	2.81	3.70	5.49	7.28	1.79
.68	1.98	2.87	3.78	5.61	7.44	1.83
.69	2.02	2.94	3.87	5.73	7.61	1.87
.70	2.07	3.01	3.95	5.86	7.77	1.91
.71	2.12	3.07	4.04	5.99	7.94	1.95
.72	2.16	3.14	4.13	6.12	8.11	1.99
.73	2.21	3.21	4.22	6.25	8.28	2.04
.74	2.26	3.28	4.31	6.38	8.45	2.08
.75	2.31	3.35	4.40	6.51	8.62	2.12
.76	2.36	3.42	4.49	6.64	8.80	2.16
.77	2.41	3.49	4.58	6.77	8.97	2.20
.78	2.46	3.56	4.67	6.91	9.15	2.25
.79	2.51	3.63	4.76	7.04	9.33	2.29
.80	2.56	3.70	4.85	7.18	9.51	2.33
.81	2.61	3.77	4.95	7.31	9.69	2.37
.82	2.66	3.85	5.04	7.45	9.87	2.42
.83	2.71	3.92	5.14	7.59	10.05	2.46
.84	2.77	3.99	5.23	7.73	10.23	2.51
.85	2.82	4.07	5.33	7.87	10.42	2.55
.86	2.87	4.14	5.43	8.01	10.60	2.59
.87	2.93	4.22	5.52	8.15	10.79	2.64
.88	2.98	4.29	5.62	8.30	10.98	2.68
.89	3.04	4.37	5.72	8.44	11.17	2.73

Streamflow Measurement Devices

Weir Measurement

Weir Sticks

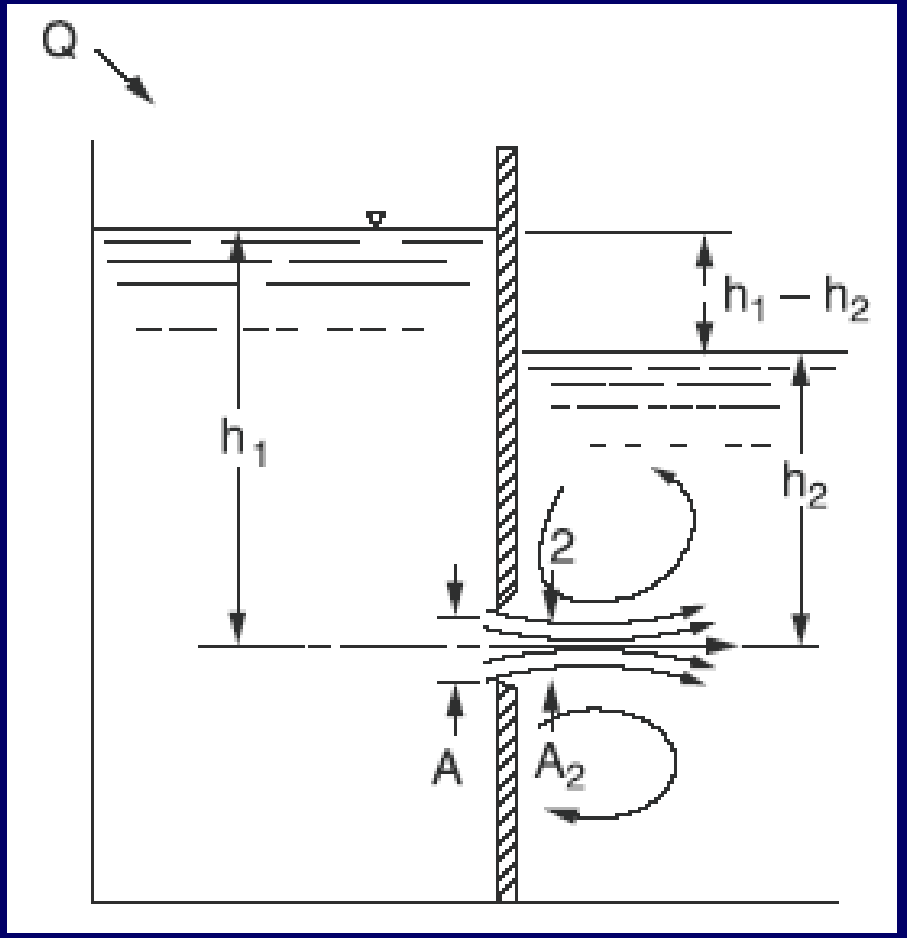
- Calibrated stick that shows adjusted depth of flow when placed on weir crest

- Width (ft) x Weir Stick Reading cfs/ft = Flow Rate cfs

Streamflow Measurement Devices

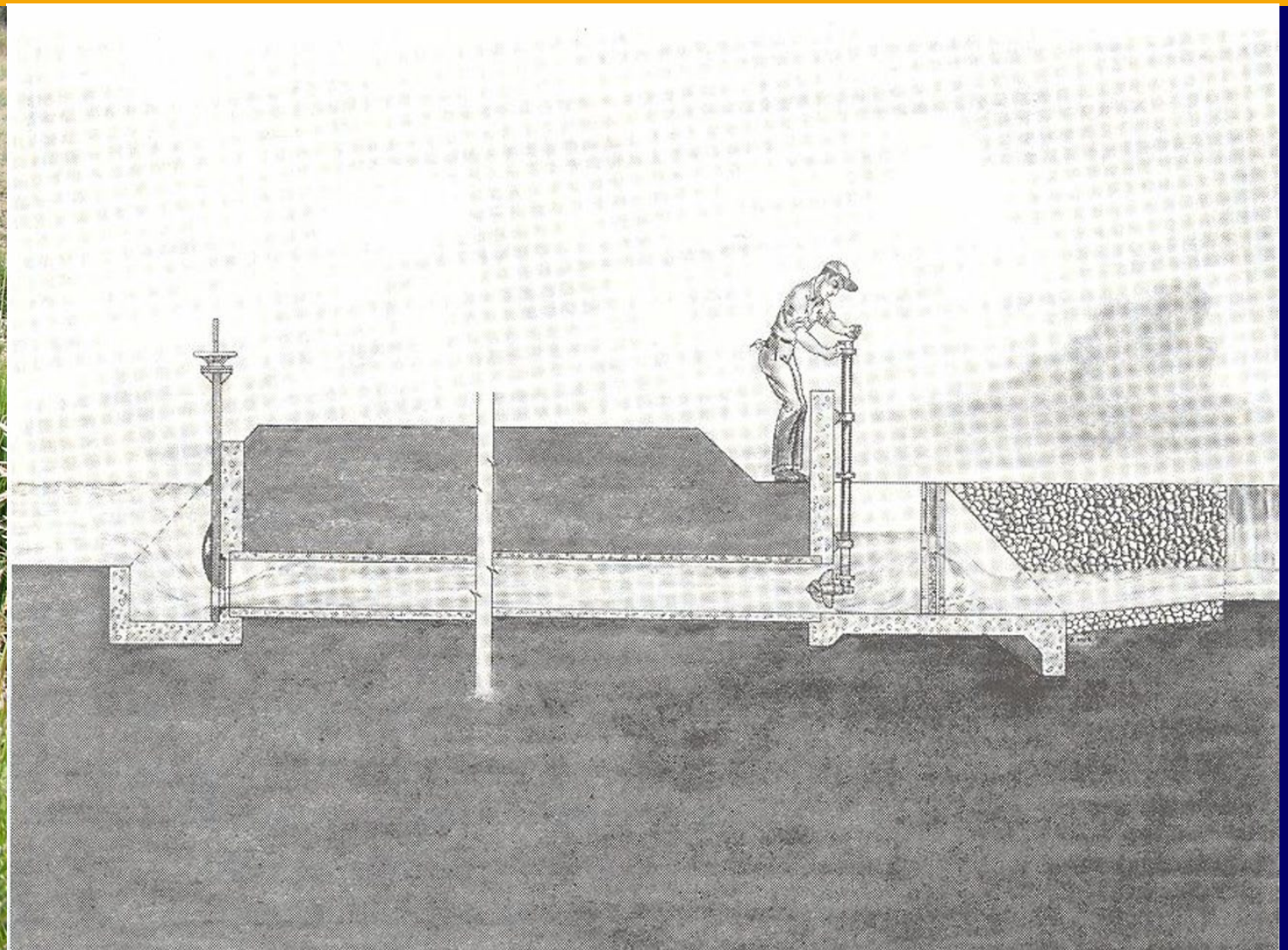
Submerged Orifices

- Need area of rectangular orifice
- Need height of water above orifice on upstream side
- Orifice should be small compared to submerged x-section
- Look up in table



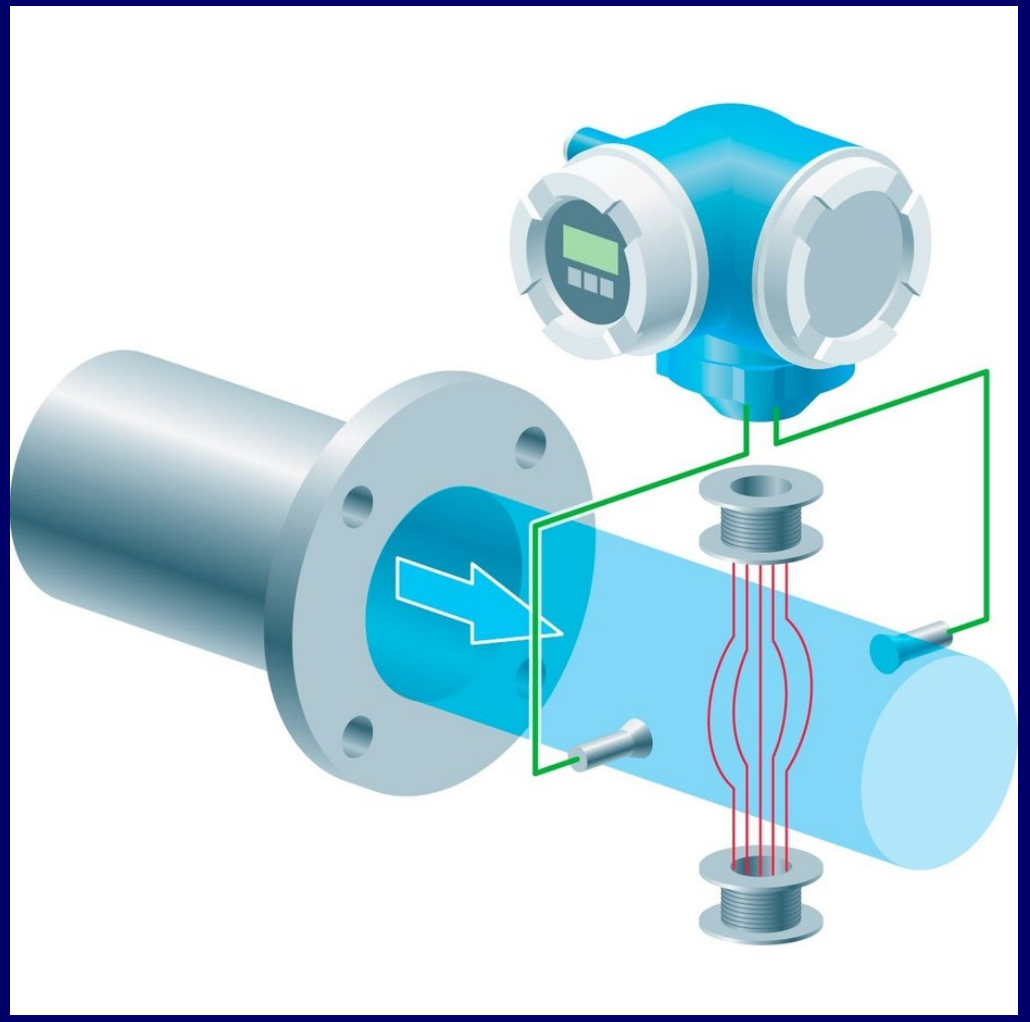
Streamflow Measurement Devices

Culvert Measurements



Streamflow Measurement Devices

In-Line Meters



Streamflow Measurement Devices

Stream Gages

- Devices that measure water height
  - Radar, bubblers, floats, or pressure transducers
- Can be mounted within flumes, weirs, or independently to provide a continuous discharge record
- Regular measurements need to be taken to establish a rating curve
- Can transmit data or be downloaded manually

Streamflow Information

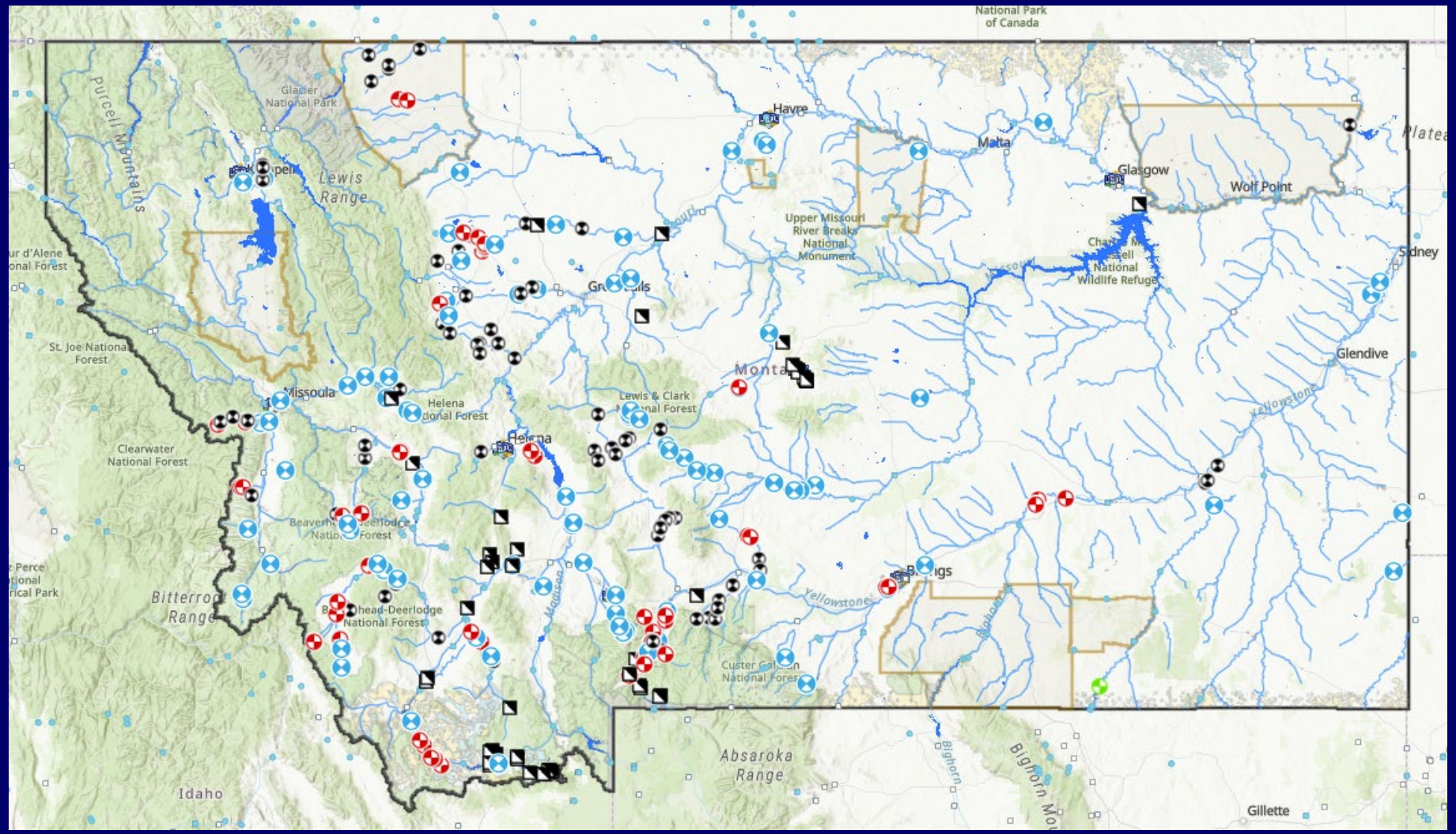
StAGE - Stream And Gage Explorer

100 real-time gages by July 1, 2025

FWP & USGS gages accessible

Site update early 2026

https://gis.dnrc.mt.gov/apps/StAGE/



Streamflow Information

Organizations with Surface Water Info

- **USGS** (major streams)
- **Montana DNRC** (tributary streams & reservoirs)
- **Montana Bureau of Mines and Geology** (ditches & springs in select watersheds)
- **Bureau of Reclamation** (reservoir data)
- **US Army Corps of Engineers** (reservoir data)

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Questions?

https://gis.dnrc.mt.gov/apps/StAGE/

QUESTION FOR A PRIZE!

What type of measuring device would you use on flatter ditch with low head loss, the potential for submerged flows, high sediment loads, and high debris load?

A) Flume
B) Broad crested weir
C) Ramp flume
D) All of the above


MONTANA
DNRC
OUTSIDE THE MANUAL
WSB DNRC

Thank you

Questions?