



Welcome!

Intake Diversion Dam Fish Passage

**This is an informal Public Scoping Open House.
There will not be a formal presentation.**

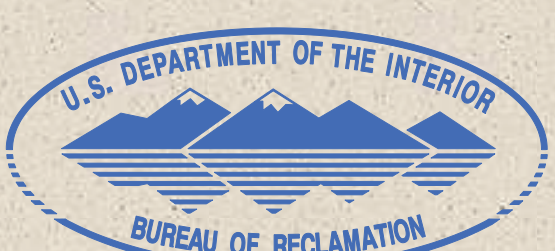
Nine information stations are available including:

- Lower Yellowstone Project Background
- A Living Fossil – The Endangered Pallid Sturgeon
- Proposed Action, Purpose and Need, Resources to be Considered
- Rock Ramp Alternative
- Bypass Channel Alternative
- High Flow Channel Alternative
- Pumping Alternative
- Non-weir Alternative
- What Comes Next?

We encourage your comments. Comment sheets are available tonight or can be completed and postmarked or received by February 18, 2016 to:

**Mail: U.S. Army Corps of Engineers
Omaha District
ATTN: CENWO-PM-AA
1616 Capitol Avenue
Omaha, NE 68102**

Email: cenwo-planning@usace.army.mil



U.S. Department of the Interior
Bureau of Reclamation

Intake Diversion Dam Fish Passage Project
Lower Yellowstone Project



US Army Corps
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Lower Yellowstone Project

Construction of the Lower Yellowstone Diversion Dam began in 1905. Water for irrigation was first diverted in 1909. The Project provides a dependable supply of irrigation water for 54,000 acres of lands along the west bank of the Yellowstone River in the Project irrigation districts. It has been operating since the early part of the 20th Century without major changes to its form or function. Approximately two-thirds of the irrigated lands are in Montana with the remaining located in North Dakota.



The Project diverts approximately 327,000 acre feet of water annually from the Yellowstone River into the Main Canal at the Diversion Dam near Intake, Montana, about 18 miles downstream of Glendive. Water flows by gravity through 71 miles of the Main Canal and a 225-mile lateral system toward the confluence of the Yellowstone and Missouri rivers to service most of the irrigated lands.

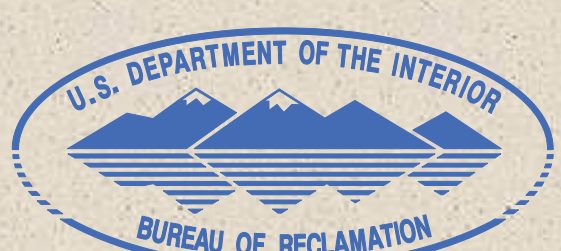
The Diversion Dam was originally constructed as a rock-filled timber crib weir about 12 feet high and containing about 23,000 cubic yard of material. Two-thirds of the timber was replaced in the early 1970s.

On an as-needed basis, 300-1200 cubic yards of large quarried rock are placed across the crest of the Diversion Dam to replace rock displaced by high flows and/or ice. The rock is transported over the river via an overhead cable system and dropped on the crest of the dam.

A new headworks structure was constructed in 2011 and was used for the first time in the 2012 irrigation season. The new headworks has 12 rotating drum screens that has reduced entrainment of fish into the main canal.

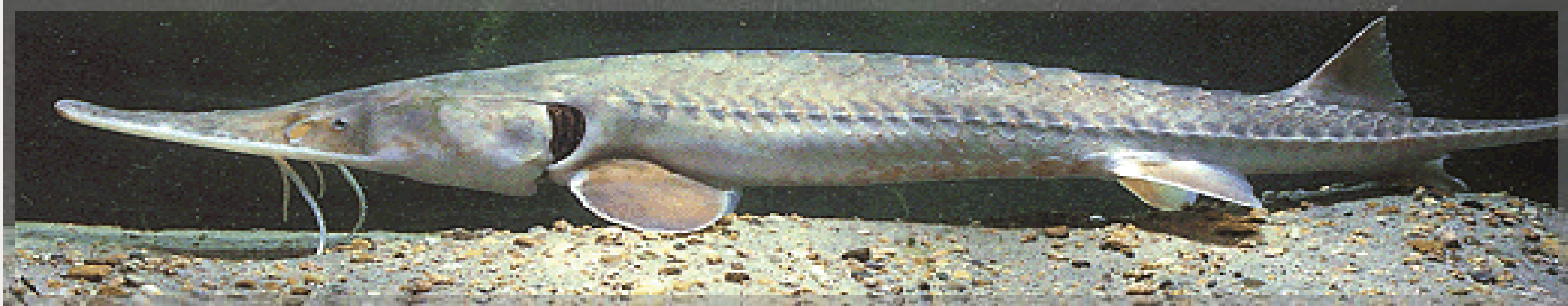


Approximately 398 farms served by the Lower Yellowstone Project produce diverse crops, including sugar beets, small grains, hay and corn. Annual gross crop values are currently about \$25-\$30 million. The Project irrigation districts are responsible for operating and maintaining the irrigation facilities under a contract with Reclamation.



A Living Fossil!

The Endangered Pallid Sturgeon



Status

- The pallid sturgeon is a descendant of fish that lived 70 million years ago.
- The U.S. Fish and Wildlife Service listed the pallid sturgeon as “endangered” in 1990.
- Their historical range spanned parts of the Missouri River, lower Mississippi River, and Yellowstone River.
- Pallid sturgeons in the Missouri and Yellowstone Rivers of Montana are at risk of dying out if natural recruitment (addition of young fish to the population) is not restored soon.

About Pallid Sturgeon

- The pallid sturgeon is covered by pale, bony plates, called scutes, instead of scales.
- They have a sucker-type mouth with whisker-like barbels. They feed on small fish, aquatic insects, mollusks and other food from the river bottom.
- Pallid sturgeons are related to shovelnose sturgeons, but are larger and usually paler.
- Pallid sturgeon can grow up to 6 feet long, weigh up to 80 pounds, and live more than 60 years.
- Females take 13-15 years to reach reproductive maturity and males usually mature to adulthood between the ages of 5 to 7 years.
- They are adapted to living on the bottom of large, turbid river systems and migrate great distances to fulfill their life history.

So, What is the Problem?

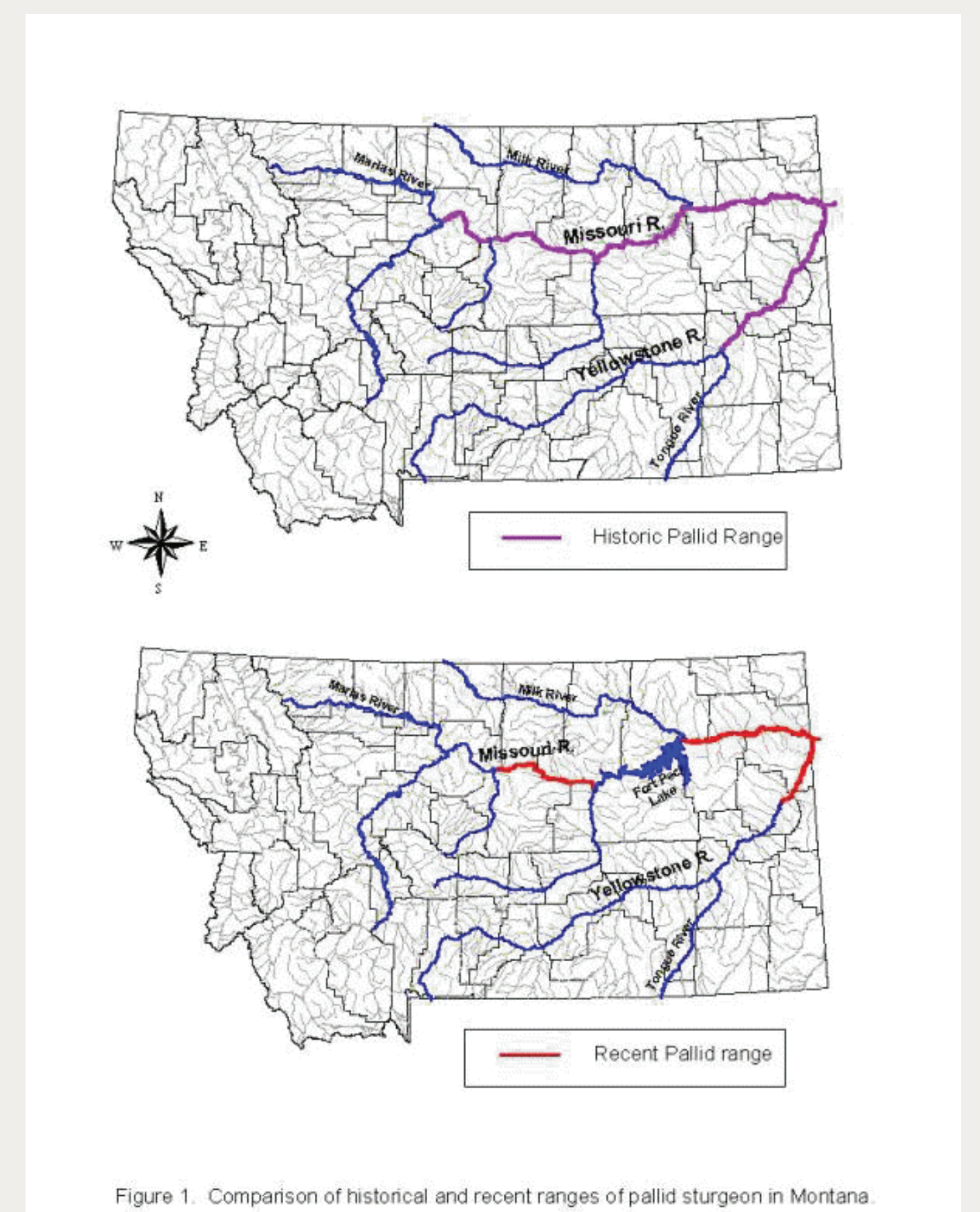
- Pallid sturgeons are strong swimmers in straight-line currents, but do not swim well in turbulent waters caused by the Intake Diversion Dam.
- They migrate upstream to spawn in the spring to lay eggs that adhere to the bottom of the river. As these eggs hatch, the larvae (newly hatched fish) cannot swim, but instead drift downstream until they are strong enough to swim and find suitable habitat. This takes about 13-15 days.
- If pallids spawn below the Intake Diversion Dam, the larvae are believed to drift into Lake Sakakawea and perish in the lake-like environment.



- If adults could pass over or around the Intake Diversion Dam, they could spawn far enough upstream that the larvae could gather strength to survive before drifting into Lake Sakakawea.
- The Yellowstone River above the Intake Diversion Dam is historic spawning habitat and is suitable for pallid sturgeon restoration.

Endangered Species Act

- Federal agencies are required by law to consult with the U.S. Fish and Wildlife Service on the effects of projects on endangered species. Consultation with the Service on this project has identified fish passage and entrainment protection issues that need to be addressed to protect the pallid sturgeon.



What Comes Next?

The public will have until February 18, 2016 to submit scoping comments on the proposed project for the Intake Draft Environmental Impact Statement.

Public scoping comments are encouraged to assist agencies in identifying the scope of potentially significant environmental, social, and economic issues relevant to the proposed Federal action and determining reasonable alternatives to be considered in the EIS. Reclamation and the Corps will carefully consider all comments received during the scoping period.

Comments are most useful when they are specific and relate to the proposed federal action, alternatives, or resources that may be impacted.

Example:

- I don't want this project.
- Better = I don't want this project because it will increase the amount of traffic and noise.
(This comment helps the agencies understand the issue of concern.)

NEPA Process
Notice of Intent
Public Scoping Meetings and 45-Day Comment Period
Scoping Report
Evaluation and Analysis of Issues and Alternatives
Draft EIS
Public Meetings and 45-Day Comment Period
Final EIS
30-Day Notice of Availability
Record of Decision

<==== We are Here

How to Submit Comments:

Written comments at tonight's scoping meeting

Email : cenwo-planning@usace.army.mil

Mail : U.S. Army Corps of Engineers
Omaha District
ATTN: CENWO-PM-AA
1616 Capitol Avenue
Omaha, NE 68102



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Proposed Action, Purpose and Need, and Resources to be Considered

The Corps and Reclamation are jointly preparing an environmental impact statement (EIS) for the proposed Intake Diversion Dam Fish Passage Project.

The proposed federal action is to improve passage at Intake Diversion Dam for endangered pallid sturgeon and other native fish in the lower Yellowstone River.

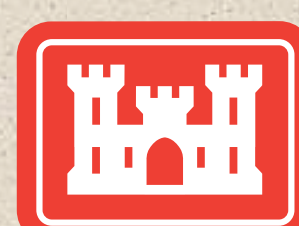
The purpose and need for the project is to:

- Improve pallid sturgeon fish passage, and
- Continue viable and effective operation of the Lower Yellowstone Project.

The Corps and Reclamation will consider a range of reasonable alternatives to the proposed federal action that meet the purpose and need.

The preliminary resources expected to be analyzed in the EIS include:

- Fish and Wildlife
- Hydrology
- Water Quality
- Social and Economic Conditions
- Cultural Resources
- Recreation
- Climate Change and Air Quality
- Endangered Species
- Environmental Justice
- Geomorphology
- Transportation and Noise
- Land Use and Vegetation



Alternatives

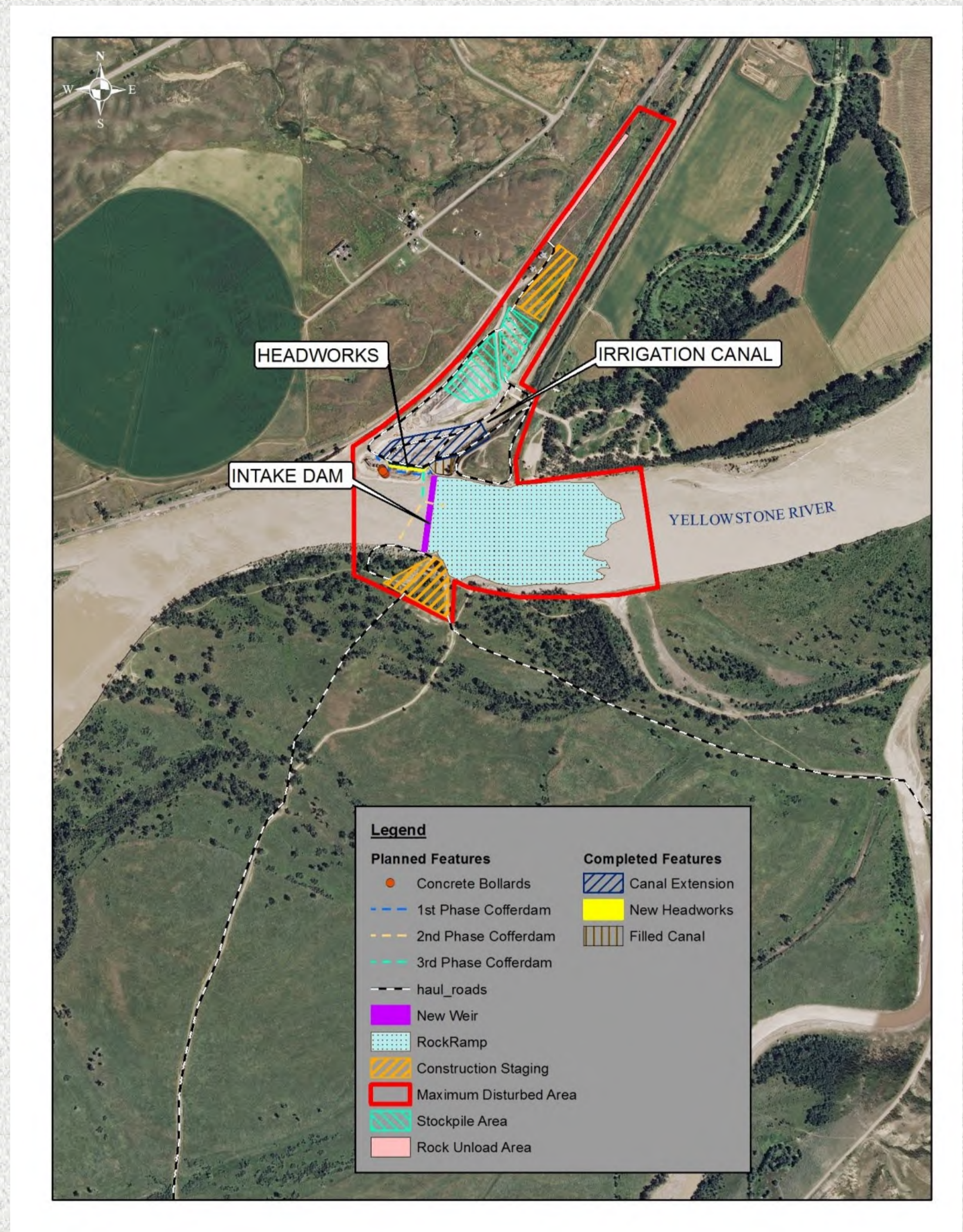


Rock Ramp Alternative

Replace the existing weir with a new concrete weir and a shallow sloped, un-grouted boulder and cobble rock ramp.

Main Features

- New concrete weir
- Shallow-sloped, un-grouted boulder and cobble rock ramp.
- The weir crest would vary in elevation, including at least one low-flow channel for fish passage.



7,000 cfs



15,000 cfs



30,000 cfs



40,000 cfs

Colors indicate where BRT depth and velocity criteria are being met



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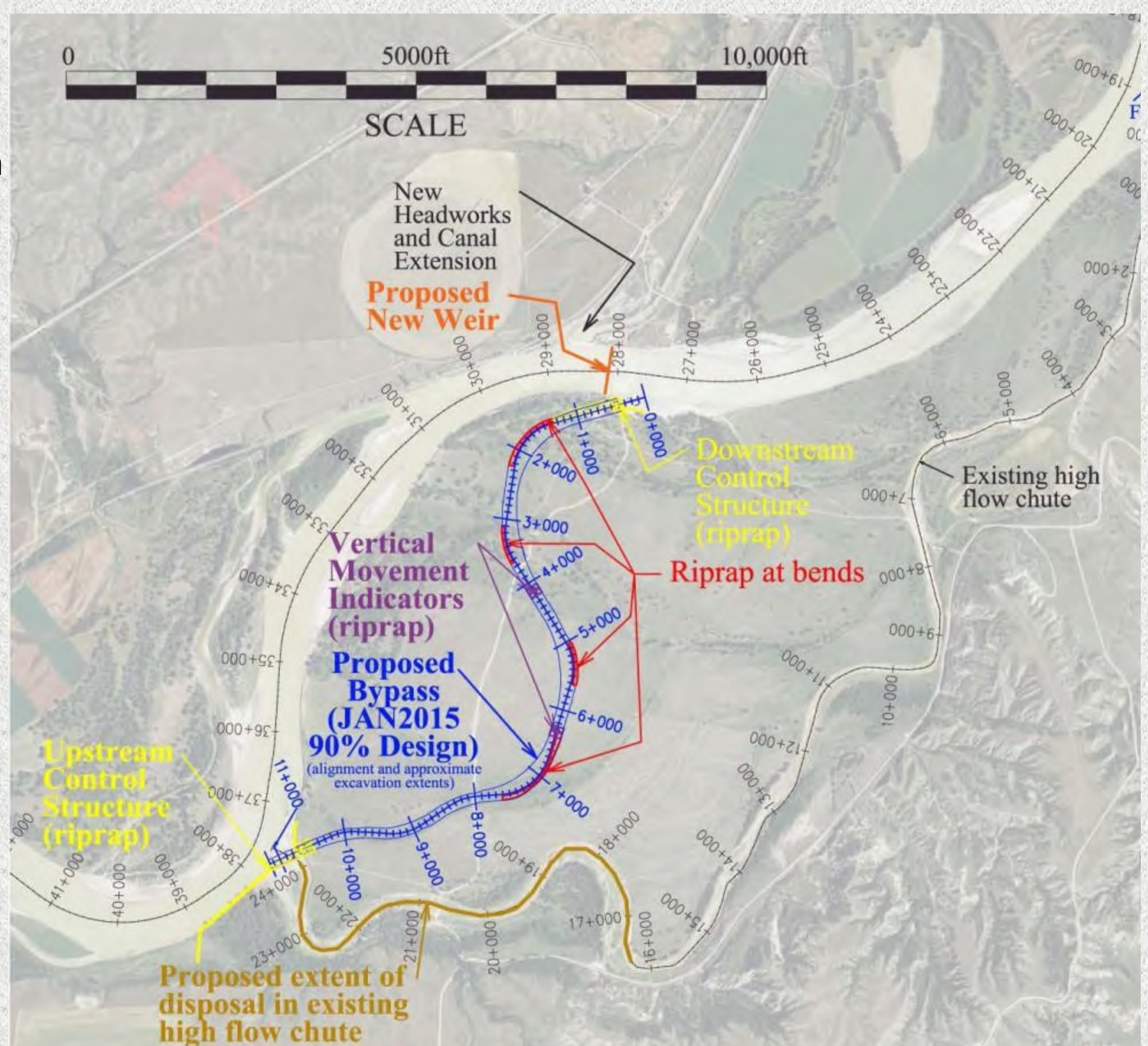
Alternatives

Bypass Channel Alternative

This alternative would construct a bypass channel around the existing weir to divert approximately 15% of total river flow.

Main Features

- Grade control structures at downstream and upstream ends of the channel
- Two vertical control structures (riprap sills)
- Bank riprap at four outside bends
- A new weir with 6' wide concrete cap
- Fill placed between the new weir and existing weir
- Excavated fill placed in existing high flow chute



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Alternatives

High Flow Channel Alternative

This alternative would modify an existing side channel around the existing weir to divert river flow, and meet fish passage criteria.

Main Features:

- The high flow channel is an approximately 4 mile long side channel along Joe's Island opposite the river channel to Intake.
- Excavate existing high flow channel to provide appropriate conditions for pallid sturgeon passage.
- Parameters to consider for fish passage are related to depth, velocity, and timing.

Table 1 U.S. Fish and Wildlife Service Design Criteria

Discharge at Sidney, Montana USGS Gage:	7,000-14,999 ft ³ /s	15,000-63,000 ft ³ /s
Bypass Channel Flow Split	≥12%	13% to ≥ 15%
Bypass Channel cross-sectional velocities (measured as mean column velocity)	2.0 - 6.0 ft/s	2.4 - 6.0 ft/s
Bypass Channel Depth (minimum cross-sectional depth for 30 contiguous feet at measured cross-section)	≥ 4.0 ft	≥ 6.0 ft
Bypass Channel Fish Entrance (measured as mean column velocity at HEC-RAS station 136)	2.0 - 6.0 ft/s	2.4-6.0 ft/s
Bypass Channel Fish Exit (measured as mean column velocity)	≤ 6.0 ft/s	≤ 6.0 ft/s



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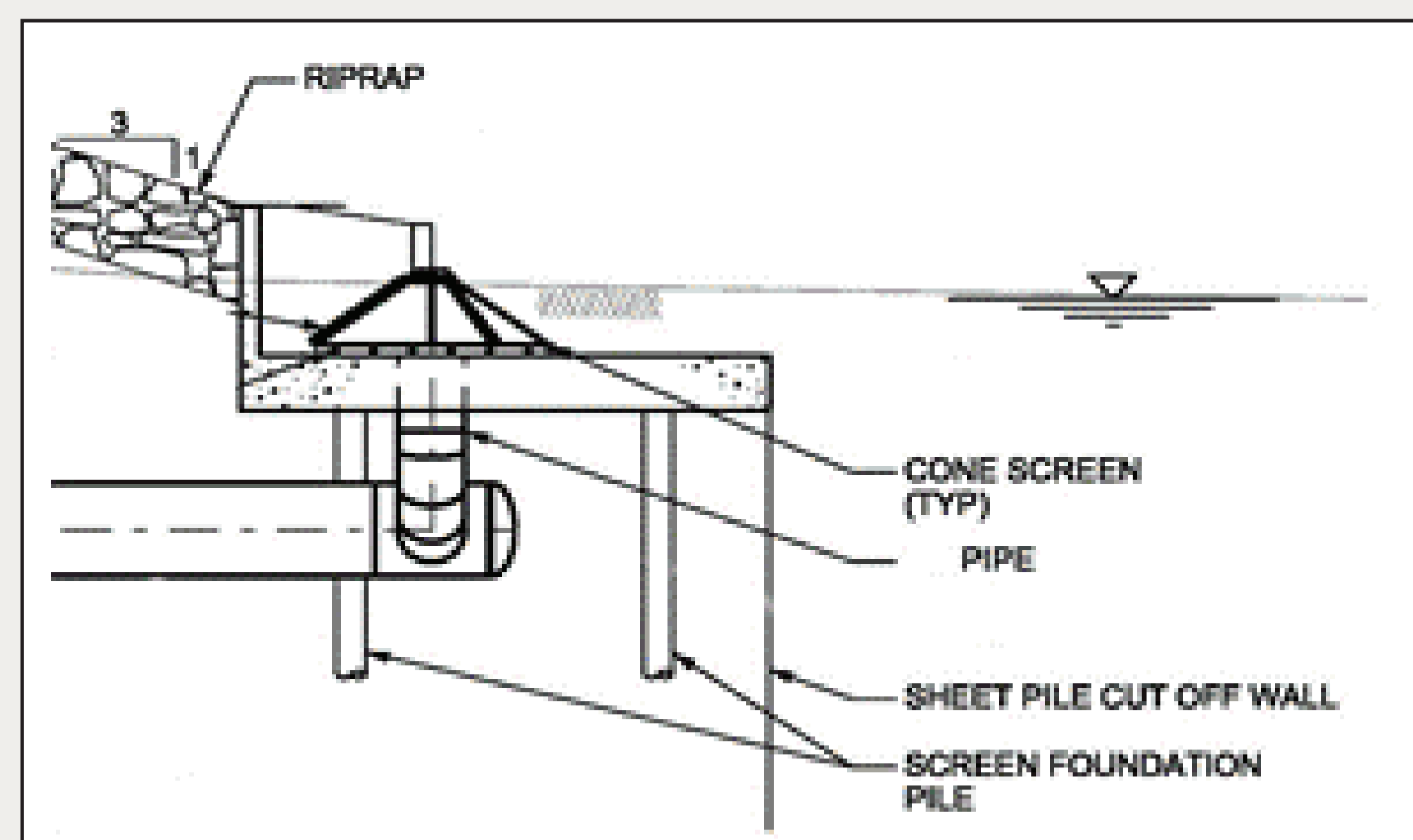
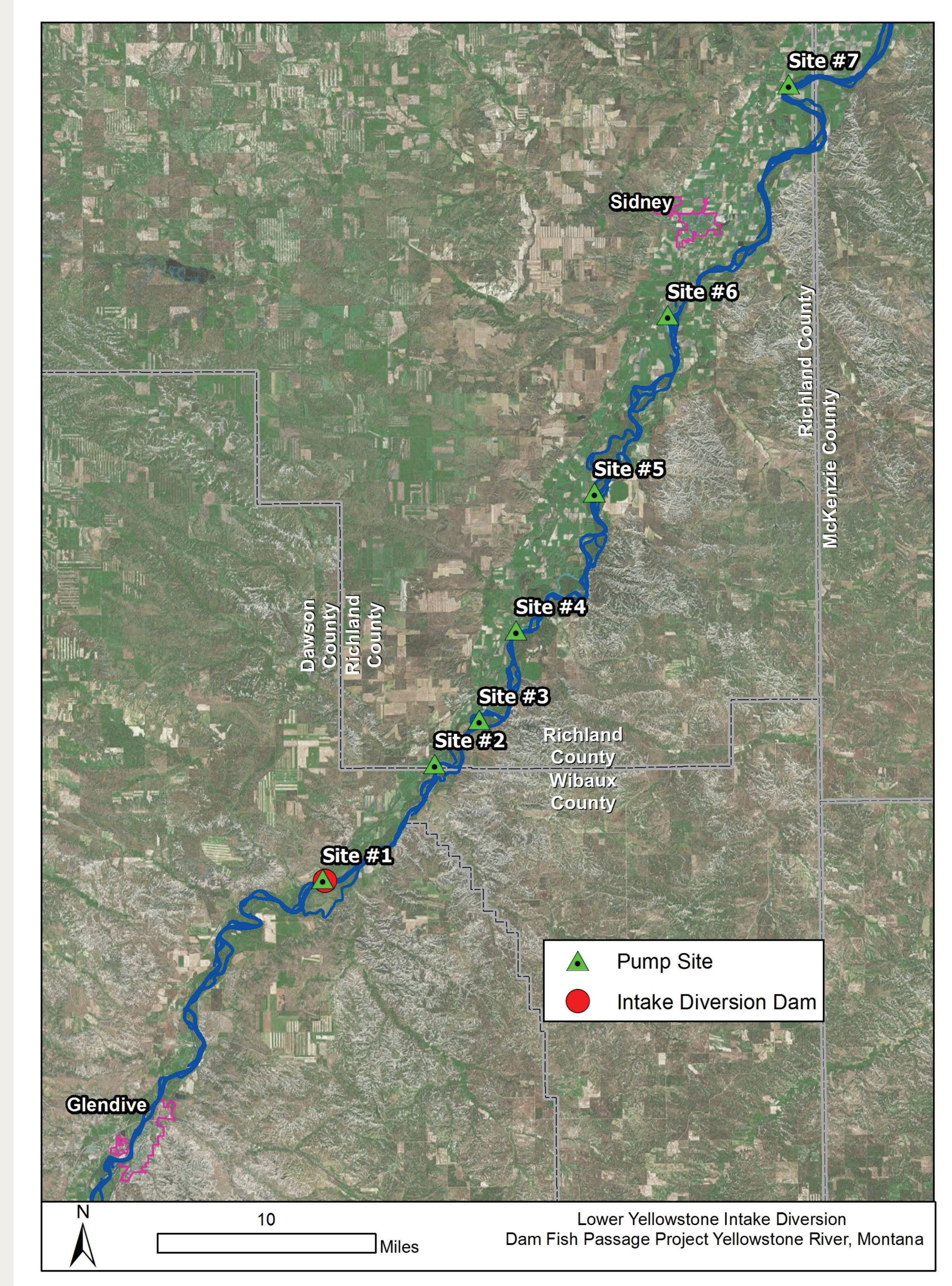
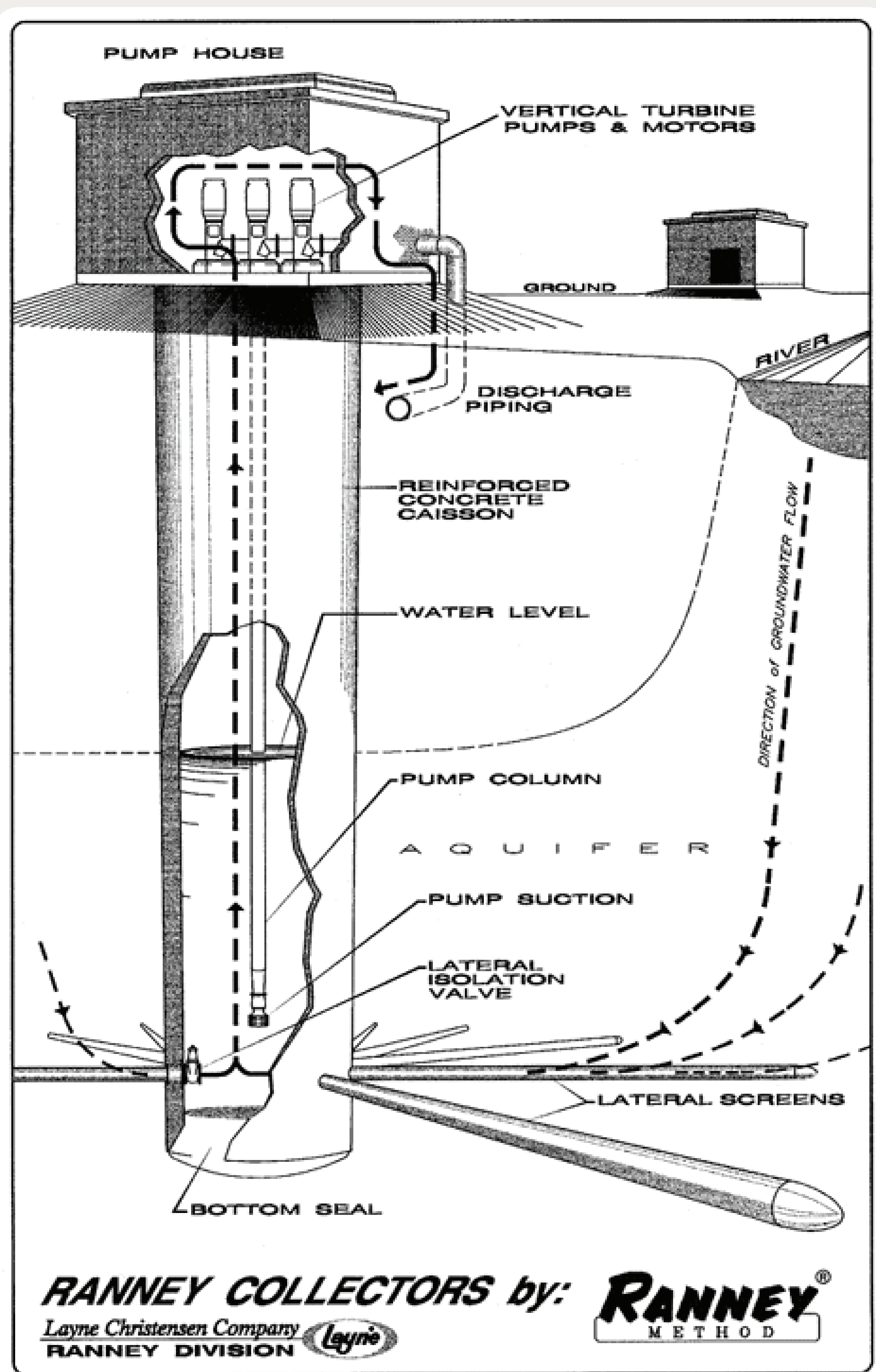
Alternatives

Pumping Alternative

The alternative is a conceptual design that includes either pumping stations (surface water) or Ranney® wells (infiltration galleries) to divert water into the existing irrigation canal.

Main Features:

- Removal of Intake Diversion Dam.
- Screened surface water intakes or infiltration galleries constructed along the Yellowstone River.
- Pumping stations and piping to deliver water to irrigation canal.
- Existing intake may still be used, depending on water levels.
- Power supply and backup generators.



Conceptual Cone Shaped Screen



Alternatives

Non-weir Alternative

This alternative would include the removal of the Intake Diversion Dam and the implementation of either a pumping station (surface water) or a Ranney® well (infiltration gallery). Conservation measures would also be implemented to reduce water demands.

Main Features:

- Pumping Stations
- Conservation Measures
- Alternative Energy Sources
- Dam Removal

