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# **Lower Yellowstone Intake Diversion Dam Fish Passage Project, Montana**

**FINAL - Appendix G**

**Actions to Minimize Effects**



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## 1.0 Introduction

A key factor in successful construction and operation of the Lower Yellowstone Intake Diversion Dam Fish Passage Project (Project) would be the implementation of actions to minimize effects during construction and post-construction monitoring. To ensure that Project activities are completed concurrently and in full compliance with all environmental commitments, Reclamation and the Corps would establish the Environmental Review Team (ERT) to implement management practices to avoid, minimize or mitigate adverse impacts to Project area resources if a Record of Decision (ROD) is signed.

The ERT team would be comprised of federal, state, and local entities, which would develop the specific actions and monitoring programs and provide input to Reclamation and the Corps. This team could include technical representatives of the following agencies:

- Bureau of Reclamation
- U.S. Army Corps of Engineers
- Lower Yellowstone Irrigation Project Board of Control
- Montana Department of Natural Resources and Conservation
- Montana Fish, Wildlife & Parks
- U.S. Fish and Wildlife Service
- Montana State Historic Preservation Officer
- Other technical entities as deemed important to the process

When construction affects private lands or lands administered by agencies other than those listed above, landowners or specialists representing other agencies would be invited to participate on the team for the components that potentially affect their lands.

The purpose of this team is to ensure that Project activities are completed concurrently and in compliance with all environmental commitments in NEPA documents, such as the Final EIS and ROD. This team would also address other relevant state and federal environmental rules and regulations, such as the Clean Water Act and the National Historic Preservation Act.

ERT Responsibilities, Goals, and Objectives may include:

- Review and evaluate project construction plans and specifications to assist in identifying, avoiding, minimizing, or mitigating potential impacts to resources. Annually or as needed, the team would review modifications to the construction plans.
- Conduct field reviews (annually or as needed) prior to construction to identify environmentally sensitive areas where site-specific mitigation may be required.
- Review construction plans to determine if all required field surveys within the appropriate survey periods have been completed prior to Project disturbance.
- Review previous construction activities to determine if required mitigation measures are sufficient and have been accomplished and prepare an annual environmental mitigation/progress report for the Project.

- Recognizing that the details of Project impacts cannot be fully identified until the final engineering stage, many of the environmental commitments (identified below) are general in nature. Depending upon the alternative selected in the ROD, the following commitments would be implemented to avoid adverse impacts to resources. Some of these commitments are not applicable to every alternative. Some are specific to a certain alternative. The ROD would list the environmental commitments applicable to the selected alternative.

The ERT would provide input to minimizing effects during construction as well as long-term monitoring during and after construction. Actions proposed under both of these categories are described below.

## **1.1 Actions to Minimize Effects During Construction**

### **1.1.1. Air Quality**

- Minimize clearing vegetation within the construction work areas, access areas, and project facilities.
- Conduct construction, operation, and maintenance activities to minimize the creation of dust. This may include measures such as limitations on equipment, speed, and/or travel routes. Water, dust palliative, gravel, combinations of these, or similar control measures may be used.
- Implement measures to minimize the transfer of mud onto public roads.
- Maintain construction, operation and maintenance equipment in good working order. Equipment and vehicles with excessive emissions due to poor engine adjustments or other inefficient operating conditions would be repaired or adjusted.
- In active construction areas, including access roads, limit speeds of non-earth-moving equipment to 15 miles per hour. Limit speed of earth-moving equipment to 10 mph.
- Limit idling of heavy equipment to less than 5 minutes unless needed for the safe operation of the equipment; verify through unscheduled inspections. Turn off idling equipment when not in use.
- Implement a fugitive particulate emission control plan that specifies steps to minimize fugitive dust generation.
- Stabilize spoil piles and sources of fugitive dust by implementing control measures, such as covering and/or applying water or chemical/organic dust palliative where appropriate at active and inactive sites during workdays, weekends, holidays, and windy conditions.
- Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions.
- Prevent spillage when hauling spoil material.
- Plan construction scheduling to minimize vehicle trips.
- Maintain and tune engines per manufacturer's specifications to perform at EPA certification levels. Prevent tampering of source engines (i.e., knowingly disabling an emission control system component or element of design of a certified engine so that it no longer meets the manufacturer's specifications). Conduct unscheduled inspections to ensure these measures are followed.

### **1.1.2. Surface Water Hydrology and Hydraulics**

- Ensure compliance with the provisions of Section 404 of the Clean Water Act for temporary or permanent discharges of dredge or fill material into waters of the U.S., including minimizing quantities of dredge or fill.
- Ensure compliance with the provisions of Section 401 of the Clean Water Act and obtain Montana State Water Quality Certification for compliance with state water quality standards.
- Ensure compliance with the provisions of Section 402 of the Clean Water Act and obtain a National Pollution Discharge Elimination System (NPDES) permit.
- Design coffer dams to obstruct the least amount of the channel or floodway to minimize the potential for affecting flood flows or ice jams.
- Consider further water conservation elements in the long-term operation of the Lower Yellowstone Project to reduce the demand for water withdrawals and the need for placing rock with alternatives that leave the Intake Diversion Dam in place.

### **1.1.3. Groundwater Hydrology**

#### **Minimize the Potential for Release or Mismanagement of Hazardous Materials**

- Contamination of water at construction sites from spills of fuel, lubricants, and chemicals would be minimized by following safe storage and handling procedures in accordance with state laws and regulations.
- Personnel training on health, safety, and environmental matters would include practices, techniques, and protocols required by federal and state regulations and applicable permits.
- Any herbicides used during construction and operation and maintenance would be applied according to label instructions and any federal, state, and local regulations.
- Emergency and spill response equipment would be kept on hand during construction and operation.
- Refueling and maintenance of vehicles and the storage of fuels and hazardous chemicals would be restricted within at least 100 feet of wetlands, surface water bodies, and groundwater wells, or as otherwise required by federal, state, or local regulations.
- Sanitary toilets convenient to construction would be provided. These would be located more than 100 feet from any stream, tributary or wetland. They would be regularly serviced and maintained. Waste disposal would be properly manifested. Employees would be notified of sanitation regulations and would be required to use sanitary facilities.

#### **Minimize Changes to Stormwater Runoff and Infiltration Rates**

- Measures would be employed to reduce wind and water erosion. Erosion and sediment controls would be monitored daily during construction for effectiveness, particularly after storm events. The most effective techniques would be identified and employed.
- Contractor would be required to have an approved construction stormwater management plan to control runoff.
- All areas along the bank disturbed by construction would be seeded with native vegetation to minimize erosion.

- Silt barriers, fabric mats, or other effective means would be placed on slopes or other eroding areas where necessary to reduce sediment runoff into stream channels and wetlands until vegetation is re-established. This would be accomplished before or as soon as practical after disturbance activities.
- Clearing of vegetation within construction areas would be minimized.
- Vehicular travel would be restricted to construction areas and other established areas within the construction, access, or maintenance easements.
- Roads not otherwise needed for maintenance and operations would be restored to preconstruction conditions. Restoration practices may include decompacting, recontouring, and re-seeding.
- Avoid or minimize damage to drainage features and other improvements such as ditches, culverts, levees, tiles, and terrace. If these features or improvements are inadvertently damaged, they would be repaired or replaced.
- Minimize compaction of soils and rutting through appropriate use of construction equipment (e.g., low ground pressure equipment and temporary equipment mats).
- Minimize the amount of time that any excavations remain open.

#### **Minimize Changes to Existing Groundwater Availability**

- River morphology would be monitored to assess potential changes to the stream channel resulting from construction of the selected alternative.
- Access roads would be constructed to minimize disruption of natural drainage patterns, including perennial, intermittent, and ephemeral streams.
- Groundwater wells and springs within 150 feet of construction areas would be located and impacts on them would be minimized.
- If any groundwater wells are needed to support operational facilities, withdrawal volumes would be limited so as not to adversely affect supplies for other uses.
- Water would be procured from municipal water systems where such water supplies are within a reasonable haul distance; any other water required would be obtained through permitted sources or through supply agreements with landowners.

#### **1.1.4. Geomorphology**

For any of the action alternatives, the following actions are recommended to minimize effects on the Yellowstone River geomorphology during construction and during long-term operation and maintenance:

- Ensure compliance with the provisions of Section 404 of the Clean Water Act for temporary or permanent discharges of dredge or fill material into waters of the U.S., include minimizing quantities of dredge or fill.
- Design coffer dams to obstruct the least amount of the channel or floodway to minimize the potential for affecting flood flows or ice jams and causing undesirable scour.
- Use additional crews and equipment during construction to minimize duration of in-water work and work within coffer dams to only one season if possible.
- Minimize the placement of rock and remove rock where feasible.

### **1.1.5. Water Quality**

Under each alternative, several measures would be undertaken to avoid or minimize water quality impacts. Overall, construction and operation of any alternative are expected not to have greater than minor adverse effects on water quality. In general, the following measures would be employed under all alternatives, as applicable:

- A water quality monitoring program would be established for ensuring that water quality standards are not exceeded or elevated concentrations do not persist during construction activities.
- Equipment for handling and conveying materials during construction would be operated to prevent dumping or spilling the materials into wetlands and waterways.
- Discharges of dredge or fill material into waters of the U.S. would be carried out in compliance with provisions of Section 404 of the Clean Water Act, Corps permit requirements contained in the Section 401 water quality certification issued by the Montana Department of Environmental Quality and Section 402 NPDES requirements.
- Erosion control measures would be employed where necessary to reduce wind and water erosion. Erosion and sediment controls would be monitored daily during construction for effectiveness, particularly after storm events, and the most effective techniques would be used.
- Silt barriers, fabric mats, or other effective means would be placed on slopes or other eroding areas where necessary to reduce sediment runoff into stream channels and wetlands until vegetation is re-established. This would be accomplished either before or as soon as practical after disturbance activities.
- Contamination of water at construction sites from spills of fuel, lubricants, and chemicals would be prevented by following safe storage and handling procedures in accordance with state laws and regulations.
- Hazardous materials would be handled and disposed of in accordance with a hazardous waste plan.
- In-water work, such as installation and removal of cofferdams, would be done during lowest flows of the river, when practicable, to reduce disturbance of sediment into the water column.
- The Contractor would be required to have an approved construction storm water management plan to control runoff.
- Quarried materials to be used for construction of the rock ramp would be free of contaminants and prepared to minimize introduction of sediment into the river.
- Any person, agency, or entity, both public and private, initiating construction activity that would cause short-term or temporary violations of state surface water quality standards for turbidity requires a state permit. The purpose of the permit is to provide a short-term water quality turbidity standard for construction activities, so that construction is carried out in accordance with conditions prescribed by the MTDEQ, to protect water quality and to minimize sedimentation. MTDEQ administers the permit, and its concerns regarding water quality, sedimentation, and the Intake Project have been addressed in this EIS.



### **1.1.6. Aquatic Communities**

#### *General Aquatic Communities*

- All work in the river would be performed in a manner to minimize increased suspended solids and turbidity, which may degrade water quality and damage aquatic life outside the immediate area of operation.
- All areas along the bank disturbed by construction would be seeded with native vegetation to minimize erosion.
- All contractors would be required to inspect, clean and dry all machinery, equipment, materials and supplies to prevent spread of Aquatic Nuisance Species.
- Aspects of water quality, including turbidity, would be monitored during construction, and violations of turbidity thresholds would result in temporary shutdown of in-water work.

#### *Fish*

- To avoid potential impacts, cofferdam construction and in-stream heavy equipment activity would be conducted outside of the pallid sturgeon migration season and minimized as feasible to avoid and or minimize potential impacts.
- All pumps would have intakes screened with no greater than ¼-inch mesh when dewatering cofferdam areas in the river channel. Pumping would continue until water levels within the contained areas are suitable for salvage of juvenile or adult fish occupying these areas. Fish would be removed by methods approved by the Service and MFWP prior to final dewatering.
- Reclamation would implement a monitoring and adaptive management plan to evaluate the success of any of the alternatives if they were constructed and implement measures to improve success if problems are identified. A Monitoring and Adaptive Management Plan is attached as Appendix E.
- The ability of native fish to access the Yellowstone River upstream of Intake would be monitored and is addressed in the Monitoring and Adaptive Management Plan.

### **1.1.7. Wildlife**

Actions to minimize effects on wildlife are generally shared by all alternatives; however, some specific efforts would be taken to account for differences in area of potential effect due to corresponding differences in affected habitats and associated wildlife species.

It is anticipated that migratory birds may be the single largest group of wildlife that would likely be affected by the alternatives—both short-term and long-term effects. It is imperative for efforts be made to minimize impacts to these species, and to avoid direct impacts to resources protected under the MBTA.

A Migratory Bird Management Plan (Plan) would be created for the proposed project to prevent “take” under the MBTA. The Plan would provide guidelines to modify avian habitat only outside of the breeding season to discourage nesting activity while minimizing the potential for harassing or harming birds. Other protocol would include adjusting timing of construction, avoiding certain habitats at certain times of year, and/or performing pre-construction breeding avian surveys to identify if any protections are necessary for nesting birds.

General actions to minimize effects on wildlife are as follows:

- Conduct pre-construction survey of the construction areas prior to their disturbance, to document wildlife resources in the area and establish construction buffers around those that are immovable yet sensitive, such as an active bird nest. Monitoring of the sensitive resources would occur periodically to ensure they are not disturbed or harmed by construction activities, and to document if and when they move away from the area.
- A wildlife biologist would provide awareness trainings to the construction crew to educate them on sensitive wildlife resources they may encounter during construction, and provide a vetted protocol to follow when an encounter occurs.
- Areas potentially hazardous to wildlife would be adequately protected (e.g., fenced) to prevent access that could lead to their harm.
- To protect wildlife and their habitats, project-related travel would be restricted to existing roads or proposed new access roads. Drivers should be cognizant of safely avoiding vehicle strikes. Species at particular risk to vehicle strikes include ungulates during twilight hours, various bird species, snakes, and small and mid-sized mammals. Driver safety remains paramount, and would be maximized by following this guidance for minimizing vehicle strikes of wildlife.
- Removal and/or degradation of specific habitat features identified as important to wildlife would be minimized to the extent possible. Examples include large snags, patches of mature riparian forest, and native grassland and shrubland habitat.
- Removal of mature trees would be minimized to the maximum extent practicable to minimize potential effects to potential northern long-eared bat roosting habitat.
- Wildlife-proof fencing would be used on revegetated areas, if it is determined that wildlife species and/or livestock are impeding successful vegetation establishment.
- Effort would be made to reestablish native vegetation and habitat comparable to that disturbed and/or destroyed by construction activities. This would include minimizing the establishment of invasive plant species, which greatly degrade the quality of native habitats.
- All riverbank disturbance areas would be inventoried for potential turtle nesting habitat. If turtle nesting habitat or evidence of turtle nesting is found in construction areas, construction in these areas would be restricted during June and July, or mitigation measures approved by the ERT would be implemented.

#### **1.1.8. Federally Listed Species and State Species of Concern**

A number of measures can be employed to minimize effects on listed and sensitive fish and wildlife species, including:

- Conduct pre-construction surveys within the construction footprint for listed and sensitive wildlife and plant species.
- All pumps used in the river during construction would use intakes screened with no greater than 1/4" mesh when dewatering cofferdam areas in the river channel. Pumping would continue until water levels within the contained areas are suitable for salvage of any juvenile or adult fish occupying these areas. All fish would be removed by methods approved by the Service and MFWP prior to final dewatering.
- Care would be taken to prevent any petroleum products, chemicals, or other harmful materials from entering the water.

- All work in the waterway would be performed in such a manner to minimize increases in suspended solids and turbidity that could degrade water quality and damage aquatic life outside the immediate area of operation.
- All areas along the bank disturbed or newly created by the construction activity would be seeded with vegetation native to the area for protection against subsequent erosion and the establishment of noxious weeds.
- Clearing vegetation would be limited to that which is absolutely necessary for construction of the project.
- Cofferdam sheet piles would be installed using vibratory equipment to the extent practicable to minimize noise levels and potential disturbance to fish.
- At the start of pile driving each day, conduct a low-energy ramp up with reduced noise levels to allow fish the opportunity to move from the area within close proximity of the dam.
- A monitoring and adaptive management plan would be implemented for the preferred alternative to document fish passage, entrainment, and success of the project in meeting physical and biological objectives.
- A catch and haul program would be implemented during construction to offset effects from blocking the existing side channel.

#### *Whooping Crane*

- Reclamation would monitor the Service's whooping crane sighting reports to ensure that whooping cranes are not in the Intake Project area during construction.
- Whooping crane sighting reports would be monitored by project managers to ensure that no individuals are known to be within the study area during construction, operation, or maintenance activities. If any are sighted within the study area, project managers would consult with the Service regarding appropriate actions.

#### *Interior Least Tern*

- Visual surveys would be conducted weekly from May 15 to August 15 at all potential least tern nesting areas (sparsely vegetated sandbars) within line of site of the construction area.
- All surface-disturbing and construction activities would be prohibited from occurring within 0.25 mile of any existing and active least tern or piping plover nest within the dates of May 15 to August 15.

#### *Pallid Sturgeon*

- The construction activities would be monitored by a qualified fisheries biologist to avoid direct impacts to adult or juvenile pallid sturgeon. In-stream construction activities would cease if the fisheries monitor determines there is potential for direct harm or harassment of pallid sturgeon, until the potential for direct harm or harassment has passed. This would mainly be accomplished by coordination with MFWP regarding its observation of movements of radio-tagged pallid sturgeon and other monitored native fish during the construction season.

- Any in-stream construction activity would be conducted during periods most likely to minimize the potential impact to the pallid sturgeon. Construction activities within the river would not occur during the pallid sturgeon migration season (April 15 – July 1).

### *Species of Special Concern*

Before every construction season, the ERT would meet with MFWP to determine procedures to minimize impacts to species of special concern. Surveys for species likely to occur in the Intake Project area may be required as some of these species could be potentially harmed by construction activities. Survey requirements would be coordinated with Montana Natural Heritage Program and MFWP prior to any construction activities.

These species could require surveys: bald eagle, grasshopper sparrow, red-headed woodpecker, greater sage grouse, Sprague's pipit, Townsend's big-eared bat, nine-anther clover, pale-spiked lobelia, and silky-prairie clover.

### **1.1.9. Lands and Vegetation**

The following actions would minimize general effects for all alternatives:

- Before construction begins, Reclamation and the Corps would meet with the Service and the appropriate state wildlife agencies to determine a procedure to minimize impacts to lands and vegetation. A reconnaissance survey of construction easements would be conducted to identify and verify wetlands, grasslands, woodlands, and riparian areas subject to disturbance and/or destruction in the Intake Project area during construction activities.
- All areas temporarily impacted during construction would be replanted with native vegetation immediately after construction.
- Disturbance of vegetation would be minimized through construction site management (e.g., using previously disturbed areas and existing access routes when feasible and designating limited equipment/materials storage yards and staging areas). It would be limited to that which is absolutely necessary for construction of the Intake Project.
- Areas outside of the project footprint would be fenced or flagged for protection from disturbance.
- Erosion control measures would be employed where necessary to reduce wind and water erosion. Erosion and sediment controls would be monitored daily during construction for effectiveness and only effective techniques would be used.
- No permanent or temporary structures would be located in any floodplain, riparian area, wetland or stream that would interfere with floodwater movement, except for those described in the EIS.

The following actions would minimize effects on wetlands for all alternatives:

- For the Multiple Pumps with Conservation Measures Alternative, when considering the placement of Ranney Wells, prior to beginning construction through Conservation Reserve Program lands or program wetlands, the Natural Resources Conservation Service, Consolidated Farm Services Agency, and respective landowners would be consulted to ensure that landowner eligibility in farm subsidy programs (if applicable) would not be jeopardized and that Sodbuster or Swampbuster requirements would not be violated by construction.

- The disposal of waste material, topsoil, debris, excavated material or other construction related materials within any wetland, drainage way, stream or aquatic system would be minimized to the extent possible.
- Discharges of fill material associated with unavoidable crossings of wetlands or intermittent streams would be carried out in compliance with provisions of Sections 401 and 404 of the Clean Water Act and the nationwide and/or Intake Project-specific permit requirements of the Corps.
- Low pressure equipment or pressure-spreading mats would be used as feasible to minimize compaction of wetland soils during construction.
- Rock quarry materials would come from sites with no potential to impact wetlands.

The following actions would minimize effects on grasslands for all alternatives:

- Grasslands temporarily affected during construction would be restored with similar native species immediately following construction.
- Topsoil would be removed and conserved from the bypass channel construction site. Topsoil not returned to the bypass channel banks would be used to cover fill sites and then seeded.
- Two methods of seeding should be utilized for reclamation areas. Seeds would either be drilled or broadcast based on the species being planted. Drill seeding is recommended for most grasses and large-seeded shrubs and forbs that need to be planted at least ¼ inch deep. Drill seeding is preferred for soil to seed contact, positive depth control, proper seeding rate (once calibrated), and minimum amount of seed usage. Broadcast seeding is recommended for very small and fluffy seeds that need to be planted 1/16 to 1/8 inches deep. Modern range drills may be capable of drill and broadcast seeding.
- Areas requiring re-vegetation would be seeded and mulched during the first appropriate season after redistribution of topsoil. If reseeding cannot be accomplished within 10 days of topsoil replacement, erosion control measures would be implemented to limit soil loss. Local native grass species would be used.
- Seeding should take place the first appropriate season following topsoil replacement. Seeding between October 15 and April 15 is the most effective throughout Montana because late winter/early spring is the most reliable period for moist soil conditions. In general, fall seeding (between October 15 and when the frost line is deeper than four to six inches) in eastern Montana has been more successful than spring seeding. Some seed may require cold stratification to germinate. However, spring seeding may be considered if timing of construction warrants.
- Vegetation and soil removal would be accomplished in a manner that would prevent erosion and sedimentation.
- Noxious weeds would be controlled, as specified under state law, within the construction footprint during and following construction. Herbicides would be applied in accordance with labeled instructions and state, federal, and local regulations.
- All construction equipment would be cleaned and inspected prior to mobilizing to the project site to prevent transport of noxious weed seeds and fragments.
- Grass seeding would be monitored for at least three years. Where grasses do not become adequately established, areas would be reseeded with appropriate species.

The following actions would minimize effects on woodlands, shrublands and riparian areas for all alternatives:

- The disposal of waste material, topsoil, debris, excavated material or other construction related materials within riparian areas would be minimized to the extent possible. Woodland and riparian areas would be avoided where practical when constructing permanent facilities.
- Woodland and riparian areas impacted by the Project would be restored with native species.
- Native trees and shrubs would be replaced with similar native species.
- Wood rows would be established, as feasible, along any areas disturbed along the river or new channels/canals to provide wildlife habitat and channel stability.

The following actions would minimize noxious weed effects for all alternatives:

- All contractors would be required to inspect, clean and dry all machinery, equipment, materials and supplies to prevent spread of either aquatic or terrestrial noxious weeds.
- All areas disturbed or newly created by the construction activity would be seeded with vegetation immediately after construction for protection against subsequent erosion and noxious weed establishment.
- All equipment tracks and tires working on Joe's Island or other noxious weed infested areas would be cleaned daily to reduce potential transportation to an uninfested site.
- The contractor would prepare an integrated weed plan to be approved by the Corps. It would identify best management practices to control the spread or introduction of any noxious weeds or plants. The weed plan would be implemented throughout construction.
- Seed would be certified as cheatgrass and weed free and "blue tag;" this is especially important in areas where weedy or invasive species are already present.

#### **1.1.10. Recreation**

The following actions would be implemented to avoid, minimize, or mitigate adverse impacts on recreation resources in the study area as a result of project construction. Because the action alternatives involve similar types of construction activities, a number of actions to minimize effects have been identified that would apply to all the alternatives. Additional alternative-specific actions to minimize effects are provided in the following subsections.

Actions to minimize effects which apply to all alternatives are summarized in the bullets below.

- Contractor would grade, on an as needed basis, all dirt or gravel roads within or leading to the construction zone, on both sides of the river, except in areas with historic properties.
- Contractor would use "flaggers" during periods of time when large volumes of vehicles cross the entrance road to the campground and picnic/day use area.
- The MFWP would designate access corridors around or through the construction area when the limits of construction interfere with existing access to recreation sites or the river. The MFWP would designate access corridors through the existing Intake FAS campground and picnic/day use area that could be used to access the river by foot or to launch boats under "primitive" conditions.
- Construction activities would be minimized during the paddle fishing season in order to mitigate effects on Intake fishing access site (FAS) during its peak recreation period.

- Contractor would implement dust abatement activities on all dirt or gravel roads within or leading to the construction zone, on both sides of the river for alternatives including activity on Joe's Island.
- A communication plan would be developed to alert visitors of current access restrictions, closures, and ongoing construction activities. The construction contractor would clearly post and sign any areas within any designated construction zones. Signs would include warnings limiting or prohibiting certain recreational uses within the zone, such as swimming, fishing, boating, hiking, camping, etc. Signs would be posted upstream and downstream of the Intake Diversion Dam to warn boaters of construction activity.
- The construction contractor, Reclamation, and the MFWP would meet to evaluate and coordinate closures at the FAS and Joe's Island to recreational use, including closure of construction zones to swimming, fishing, boating, hiking, camping, hunting, etc. within or on both sides of the river.
- The construction contractor, Reclamation, and the MFWP would identify a "portage" route around or through the construction zone to allow boaters to hand-carry or drag their boats past the construction zone.

#### *Bypass Channel Alternative*

Additional actions to minimize effects identified for the Bypass Channel Alternative include:

- Reclamation and the MFWP would meet to evaluate and coordinate closures at the FAS and Joe's Island to recreational use, including closure of construction zones to swimming, fishing, boating, hiking, camping, hunting, etc. on one or both sides of the river.
- Reclamation and the MFWP would develop a public notification plan to include:
  - Signs on the road leading to the FAS or Joe's Island advising the public of closures or restrictions
  - Signs indicating the location of other recreation sites including campgrounds, picnic/day use areas and boat ramps

#### *Rock Ramp Alternative*

- For the Rock Ramp Alternative, Reclamation and the MFWP would evaluate and the Corps would construct either:
  - a new boat ramp at the existing Intake FAS, or
  - a new boat ramp immediately adjacent to the existing Intake FAS, or
  - a new boat ramp at a site near the existing Intake FAS on the west side of the Yellowstone River and accessible by Highway 16.

### **1.1.11. Visual Resources**

Under each alternative, several measures would be undertaken to ensure the avoidance and minimization of visual effects. Overall, construction and operation of each alternative are expected not to have greater than moderate visual effects, and most effects would be minor or negligible.

In general, the following measures would be employed for all alternatives, where applicable;

- Minimize footprints of construction as much as possible to limit areas of effect.
- Restrict construction or staging from using areas that are subject to erosion.
- Minimize haul and access road use and improve those roads that would become permanent.

- Strategize construction schedule to minimize truck, equipment, and personnel presence.
- Minimize footprint of clearing and grubbing to protect as much existing vegetation as possible.
- Minimize stream crossings and restore shoreline or instream habitat that are damaged.
- Mulch and reseed areas that are cleared after construction is complete to facilitate return to vegetated conditions.
- Limit operation and maintenance to annual or emergency basis to reduce onsite equipment and personnel.
- For new facilities and structures, design to minimize visual intrusion when feasible;
  - Bury distribution powerlines or flow lines in or adjacent to access roads;
  - Camouflage structures/facilities to reduce visual intrusions and painting of above-ground structures not requiring safety coloration an environmental color two shades darker than the surrounding environment;
  - During implementation of vegetation treatments, create irregular margins around treatment areas to better maintain existing scenic character of the landscape;
  - Use repetition of form, line, color, and texture to blend facilities with the surrounding landscape.

#### **1.1.12. Transportation**

The measures listed below would be implemented to avoid, minimize, or mitigate adverse impacts on transportation resources in the study area as a result of project construction. Because the action alternatives involve similar types of construction activities, a number of actions to minimize effects have been identified that would apply to all the alternatives. Additional alternative-specific actions to minimize effects are provided in the following subsections.

Actions to minimize effects which apply to all alternatives are summarized in the bullets below.

- Delivery and removal of material and equipment from the construction area would be scheduled to avoid peak traffic times along Highway 16 and other local roadways.
- Contractor would designate construction routes and access points and utilize only these routes.
- Parking areas for construction workers would be designated to avoid parking impacts at existing public facilities such as Intake FAS or in the vicinity of construction areas.
- Contractor would post informational signage at key intersections to advise the public about active construction areas and traffic issues.
- Contractor would maintain Road 551, Road 303, and other roads along construction haul routes throughout construction, and perform post-construction rehabilitation, such that the roads are serviceable for public traffic to Intake FAS and to residents along Road 303 during construction and are left in equal or improved condition after construction.
- (Multiple Pump Alternative Only) Final design of the alternative would be refined to eliminate any adverse impact to the parking lot at the Intake FAS.
- (Rock Ramp Alternative Only) An abandoned BNSF siding track just north of Intake could be reinstated for delivery of riprap to the west side of the river, reducing construction truck traffic on Highway 16.



### 1.1.13. Noise

- Equipment and trucks used for project construction would utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds) wherever feasible.
- Stationary noise sources would be located as far from adjacent receptors as possible and would be muffled and enclosed within temporary sheds, incorporate insulation barriers or other measures to the extent feasible.
- Impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for project construction would be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically-powered tools. However, where use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves would be used where feasible. This could achieve a reduction of 5 dBA. Quieter procedures would be used such as drilling rather than impact equipment whenever feasible.
- Sheet piling and heavy construction equipment operations would be limited to daytime weekday periods only.
- Sheet piling operations would incorporate a three sided sound barrier wall that would enclose the sheet piling when residences are within 1 mile of the sheet piling. The sound barrier wall would have an overall minimum height 15 feet.
- The operation of the Multiple Pump Alternative incorporates pumps. To reduce the noise impact from the operations of the pumps a sound enclosure would be incorporated. The sound enclosure would be designed to provide a minimum overall noise reduction of 20 dBA. With the incorporation of the sound enclosure the noise levels from the operations of the pumps would result in a 10 dBA or less increase to the existing ambient noise level and would be below the EPA threshold of 55 dBA  $L_{DN}$ , which would result in a moderate impact.
- The operation of the Multiple Pump Alternative sites incorporate a backup emergency generator. To reduce the noise impact from the operations of the emergency generators a sound enclosure would also be incorporated. The sound enclosure would be designed to provide a minimum overall noise reduction of 30 dBA. With the incorporation of the sound enclosure the noise levels from the operations of the backup emergency generators would result in a 10 dBA or less increase to the existing ambient noise level and would be below the EPA threshold of 55 dBA  $L_{DN}$ , which would result in a moderate impact.

### 1.1.14. Social and Economic Conditions

The following actions would be implemented to avoid, minimize, or mitigate adverse impacts on social and economic resources in the study area as a result of project construction. Because the action alternatives involve similar types of construction activities, the identified actions to minimize effects would apply to all the alternatives, unless otherwise noted.

- Construction activities would be minimized during the paddle fishing season in order to mitigate effects on Intake FAS during its peak recreation period.
- A communication plan would be developed to alert visitors of current access restrictions, closures, and ongoing construction activities. The construction contractor would clearly post and sign any areas within any designated construction zones. Signs would include

warnings limiting or prohibiting certain recreational uses within the zone, such as swimming, fishing, boating, hiking, camping, etc.

- Under the Multiple Pumps with Conversation Measures alternative, siting efforts for the Ranney wells would consider farmland classification and attempt to avoid or minimize use of prime farmland or farmland of statewide significance.

#### **1.1.15. Historic Properties**

All mitigations are suggested and proposed pending consultation with the SHPO and other interested parties, as appropriate. Agreed upon mitigations would be documented in a Memorandum of Agreement and appropriate study plans (i.e. data recovery plan or research design). The Advisory Council on Historic Preservation would also be notified of any adverse effects determinations under the NHPA.

- Engineering drawings and photographs of affected buildings and structures, if available, would be filed with the State Historic Preservation Office (SHPO) and the National Archives.
- If engineering drawings and photographs are not available, the buildings and structures would be recorded in accordance with the Historic American Buildings Survey and the Historic American Engineering Record, as appropriate.
- If practicable, historic buildings or structures that must be moved for construction would be returned to their original locations after construction of the Project is completed. If that is not feasible, Reclamation would seek a party that would be willing and able to adopt the historic structure or building with appropriate preservation covenants.
- Reclamation would develop and implement a data recovery plan in consultation with the Montana SHPO, Advisory Council on Historic Preservation, and other interested parties, as appropriate, for mitigation of the Headworks Camp (24DW447).
- One or more signs would be installed at or near the Intake FAS to summarize the history of the Lower Yellowstone Irrigation Project.
- A fence would be installed around the Old Cameron and Brailey Sub-Camp (24DW298) to protect it from disturbance by unloading and storage of rock or other construction activities.
- Impacts on Intake Diversion Dam (24DW0443) may be mitigated to minor or moderate through detailed recording of the structure. Engineering drawings and photographs of the dam would be filed with the SHPO and National Archives. If engineering drawings and photographs are unavailable, the dam would be recorded in accordance with the Historic American Buildings Survey and the Historic American Engineering Record.
- Potential impacts on unidentified cultural resources in unsurveyed portions of the APE may be reduced to no effect through avoidance of unsurveyed areas. If avoidance is infeasible, impacts may be mitigated to minor or moderate by surveying such areas within the APE. Additional mitigation measures may be necessary to avoid impacts on newly identified resources/potential historic properties as a result of the survey.
- Impacts on the south rock tower and boiler building, part of 24DW0443, as a result of necessary relocation would be mitigated to no effect if the buildings can be returned to their original locations after construction. If return of the buildings is infeasible, impacts may be mitigated to moderate by identifying a party that would be willing and able to adopt the historic buildings with appropriate preservation covenants. Additionally,

impacts would be reduced by reinitiating and finalizing the June 2010 Memorandum of Agreement.

- Impacts on 24DW0296 may be mitigated to no effect through avoidance (i.e. not widening the access road through the site). If avoidance is infeasible, impacts may be mitigated to minor or moderate through monitoring of the archaeological site under an approved monitoring plan.
- Impacts on 24DW0430 and 24DW0442 may be mitigated to no effect through avoidance (i.e. not stockpiling materials on top of or driving through the sites). If avoidance is infeasible, impacts may be mitigated to moderate through consultation to resolve the NRHP-eligibility of 24DW0442 and conducting data recovery at 24DW0430 (and 24DW0442 if determined NRHP-eligible) under an approved research design.
- Potential impacts on unidentified subsurface archaeological resources may be mitigated to minor or moderate by surveying deep excavation areas (i.e. proposed channels) using subsurface probes combined with a geo-archaeological study under an approved study plan. Additional mitigation measures may be necessary to avoid impacts on newly identified resources/potential historic properties as a result of the survey.

## **1.2 Actions for Post-Construction Environmental Commitment Monitoring**

The ERT would use adaptive management principles and other methods to monitor the effectiveness of actions to minimize effects in both the short term and long term. Some items below are repeated from actions taken during construction but should be continued to be monitored once construction is completed.

### **1.2.1. Adaptive Management**

Reclamation and the Corps recognize that there is uncertainty in addressing natural resource issues. To manage this uncertainty Reclamation and the Corps have developed an adaptive management plan. The plan was developed in accordance with the Department of the Interior Policy guidance (Order 3270) and the report *Adaptive Management, The U.S. Department of Interior Technical Guide* (Wouldiams et al., 2007).

Reclamation and the Corps would follow the Monitoring and Adaptive Management Plan provided in Appendix E.

All constructed features would be monitored in accordance with the Monitoring and Adaptive Management Plan to ensure that these are operating as designed to improve fish passage and reduce entrainment.

### **1.2.2. Surface Water Hydrology**

Surface water hydrology shall be monitored as described in the Monitoring and Adaptive Management Plan.

### **1.2.3. Geomorphology**

River morphology would be monitored to assess changes to the stream channel resulting from construction of the selected alternative. The ERT would be consulted regarding specific

measures to mitigate impacts if substantive changes are determined to have been caused by the Intake Project.

#### **1.2.4. Lands and Vegetation**

The ERT would play a role in oversight of actions to minimize effects for land and vegetation. Before every construction season, Reclamation and Corps would meet with the Service and the appropriate state wildlife agencies to determine a procedure to minimize impacts to lands and vegetation. A reconnaissance survey of construction easements would be conducted to identify and verify wetlands, grasslands, woodlands, and riparian areas subject to disturbance and/or destruction in the Intake Project area during construction activities. The ERT would be consulted, as necessary, to determine appropriate avoidance and/or protection measures. If adverse impacts cannot be avoided, appropriate procedures and requirements for minimizing or mitigating effects would be discussed with the ERT. Any mitigation required would be implemented and monitored.

#### **1.2.5. Wetlands**

- The ERT would play a role in oversight of actions to ensure compliance with Sections 401 and 404 of the Clean Water Act and ensure follow up monitoring and reporting is completed and submitted.
- Where practicable, replanted riparian areas would be watered to ensure survival of planted vegetation. The long-term success of plantings would be reviewed and approved by the ERT.

#### **1.2.6. Wildlife**

- Before each construction season, the ERT would meet with MFWP to determine procedures for avoiding and minimizing impacts to nesting or migrating birds.
- To protect wildlife and their habitats, Intake Project-related travel would be restricted to existing roads and Intake Project easements. No off-road travel would be allowed, except when approved through the ERT.
- Wildlife-proof fencing would be used on reclaimed areas, if it is determined that wildlife species and/or livestock are impeding successful vegetation establishment. Fence condition and efficacy should be monitored each year.

#### **1.2.7. Federally Listed Species and State Species of Concern**

Federally listed species shall be monitored as described in the Monitoring and Adaptive Management Plan.

#### **1.2.8. Historic Properties**

Reclamation would continue consultation with the Montana State Historic Preservation Office during implementation of the formal memorandum of agreement stipulating the mitigation and treatment plan.