Chapter 2 — Alternatives

The proposed action is to upgrade access to the wasteway and stabilize localized areas of the wasteway channel so it can continue to function, as it has for the past 43 years, as a water delivery bypass when the powerplant is out of service. This chapter identifies alternatives examined but eliminated from further consideration as well as the following reasonable range of alternatives that are based on current engineering practices and input from landowners and the public:

1) No Action
2) Combining Bioengineering with Standard Engineering Techniques
3) Using Only Bioengineering Techniques
4) Using Only Standard Engineering Techniques.

NEPA typically defines "No Action" as the most likely future without the proposed Federal action. The No Action alternative serves two purposes:

- It identifies expected future environmental conditions without taking measures to stabilize the wasteway or upgrade access.
- It is the basis (baseline condition) by which all other alternatives are compared.

The three action alternatives (2, 3, and 4) offer different methods of accomplishing the purposes of and need for the action. The alternatives are described in general terms, rather than site specific, due to the continual geomorphic changes occurring within the wasteway channel and the expected long-term efforts to stabilize the channel. Also, the exact repair method for any particular eroded area would depend on what Reclamation and the landowner agree to following negotiations on right-of-way/flowage easement and stabilization methods. Until these negotiations take place, site-specific stabilization descriptions are not available.

Future Diversions Through the Wasteway

If, in the future Green Springs Powerplant needs repair or maintenance during irrigation season, Reclamation will divert flow through the wasteway to meet water delivery obligations. Future use of the wasteway is expected infrequently, based on only about five occurrences of use in the 43-year history of the wasteway.

Alternatives Considered But Eliminated From Further Consideration

A couple of alternatives discussed early in the evaluation process were eliminated from further analysis as they were shown to be technically or economically unacceptable for stabilizing the wasteway. These alternatives are:

- stabilizing the entire length of the wasteway
- constructing energy dissipaters and settlement ponds.

Alternative 1 – No Action

The No Action alternative leaves the wasteway in its current condition with unstable banks and no road access for maintenance equipment. This alternative does not address existing environmental problems associated with use of the wasteway. No work would occur under this alternative to repair or enhance bank stability.

Alternative 2 (Preferred Alternative) – Bioengineering Combined With Standard Engineering

The preferred alternative offers a well-rounded approach to stabilizing the wasteway. It effectively addresses existing environmental problems associated with past wasteway use and applies proactive, environmentally friendly measures to stabilize the wasteway. **The preferred alternative is to:**

- **stabilize localized areas of the wasteway banks and immediate upslope areas using a combination of bioengineering and standard engineering techniques,**
- **construct an access road to the wasteway within existing Reclamation right-of-way, and**
- **acquire new right-of-way/flowage easements as needed in the future.**

The preferred alternative most likely would be approximately 80 percent bioengineering techniques and 20 percent standard engineering techniques. Bioengineering techniques would be incorporated as much as possible except where a standard engineering method would be considerably more effective and reliable. Access to specific areas of the wasteway affects which type of engineering techniques can be implemented. Stabilization structures, including the types of vegetation, would be designed specifically for site characteristics and conditions based on channel and bank morphology, access, and consultation with private and Federal landowners. The process of stabilizing the wasteway would likely continue for several years.

Acquiring Additional Rights-of-Way/Flowage Easements

Reclamation has no authority to stabilize areas outside its acquired rights-of-way, and therefore, must acquire new rights-of-way/flowage easements before stabilization work on private land can proceed. Reclamation policies, authorities, and the 1890 Canal Act, would direct acquisition of additional rights-of-way/flowage easements. The *Rights-of-Way/Flowage Easements and Wasteway Access* section of chapter 1 explains this Act.

Landowner Negotiations

The goal of the stabilization efforts would be to upgrade access and stabilize the wasteway channel banks. Stabilization is not intended to fix all the basin's problems nor is it intended to upgrade private property beyond what previously existed or what was damaged by Reclamation's actions. Stabilization is instead intended to repair damage caused by diverting water through the wasteway so the wasteway can continue to function as a water delivery bypass when the powerplant is out of service.

With cooperation from landowners, Reclamation could construct additional stabilizing structures and repair channel damage downstream from the Garfas property. Reclamation would contact and meet with individual landowners as needed to discuss and negotiate the purchase of rights-of-way/flowage easements at a fair market value. After acquisition of rights-of-way, Reclamation would then discuss and negotiate site-specific stabilization efforts with individual private and Federal landowners. Some specific topics of these negotiations are:

- which sites Reclamation would stabilize
- would a site be stabilized using bioengineering or standard engineering techniques
- could specific trees be removed
- could live brush be cut
- would concrete or metal, or both, be used
- would access to the wasteway be temporary or permanent
- how heavy equipment (for standard engineering structures) could move across the property
- which vegetation species would be used

Reclamation would acquire all the necessary permits prior to beginning construction. Based on these negotiations, the required permits, and professional judgment, Reclamation would make the decision on which areas to stabilize and how. The priority of sites selected is outlined in the *Alternative 2, Proposed Work Sequence* section of this chapter.

Data Collection

Sections 32 and 5

Reclamation surveyed and developed slope, gradient, and cross section information for the wasteway channel from the pipe outlet to the west edge of the Garfas property (figure 1-4).

Sections 6 and 1

The wasteway channel centerline survey was completed from the west edge of the Garfas property downstream to where Tyler Creek enters Emigrant Creek. Slope, gradient, and cross section data will be developed.

Using Data

Reclamation would use survey data to:

- identify the physical location of existing landownership
- identify channel slope and specific areas needing standard engineering techniques that could handle higher flow velocities
- identify needed rights-of-way/flowage easements for access to and along the wasteway channel
- identify physical location of known archeological sites Reclamation would exclude from right-of-way acquisitions
- to acquire right-of-way/flowage easements

Collecting Further Data

Following negotiations with private and Federal landowners, Reclamation would gather more in-depth survey data and site-specific information as appropriate to:

- assist engineers in designing and developing appropriate stabilization structures such as standard engineering structures
- determine the quantity and type of appropriate construction materials

Bioengineering Techniques

The overall concept of bioengineering uses mostly natural materials to repair slope failures and strengthen banks to sustain released flows without further deterioration. Bioengineering techniques would be used where the channel slope is such that vegetation should withstand the expected flow velocities. The exact locations of these structures would be determined in consultation and negotiations with individual private and Federal landowners.

Vegetation Selection

Consultation with private and Federal landowners would determine appropriate site-specific vegetation species. Vegetation and seed/plant mixture selection would depend upon local availability, ease of establishment, competitiveness with invasive weed species, compatibility within the mixture, and desired streambank protection attributes. Additional native grasses (e.g. Bromus, Festuca, Stipa, and the wheatgrass/ryegrass complex) would likely augment existing grass species to maximize vegetation establishment, site stabilization, and desirable habitat values (Reclamation 2001). Native vegetation plantings and use of best management practices would reduce the likelihood of introducing noxious weeds.

The planted native vegetation would rely on natural weather patterns and ground moisture for survival. This EA is about stabilizing the wasteway rather than about changing operations to provide maintenance flows. This EA incorporates by reference the document "*Rogue River Basin Project Talent Division – Oregon, Facilities and Operations*" (Vinsonhaler 2002).

Stabilizing Infrastructures

Designs for the stabilizing infrastructures would include supporting crib structures, geotextile cover, revegetation, root wad systems, gabion fill material, rocks, and possibly small amounts of concrete and/or some metal. Some structures would be constructed from trees within the adjacent mixed conifer stand (pine, spruce, fir) and transplanting of live woody cuttings from local native shrubs (e.g., Salix, Alnus, Symphoricarpos, etc.). Some structures would be constructed from acquired, untreated wooden logs to reduce cutting of live trees. Native vegetation would develop root masses adding stability to the banks and upslope, and after a growth period, would cover infrastructure components. Specific bioengineering techniques that could be used are:

- Live cribwalls (figure 2-2) or vegetated gabions (figure 2-3) to add bulk and stabilize actively sliding, near vertical banks (figure 2-1)

- Tree revetments (figure 2-5), live fascines (figure 2-6), live stakes (figure 2-7), or brush mattresses (figure 2-8) to stabilize other sloughing banks (figure 2-4).

The bottom of the channel would substantially remain unchanged except for high velocity areas where existing rock and boulder materials would be relocated into the channel bottom to construct small hand-placed rock energy dissipaters as shown in figure 2-9.

Figure 2-1. Near vertical wasteway banks

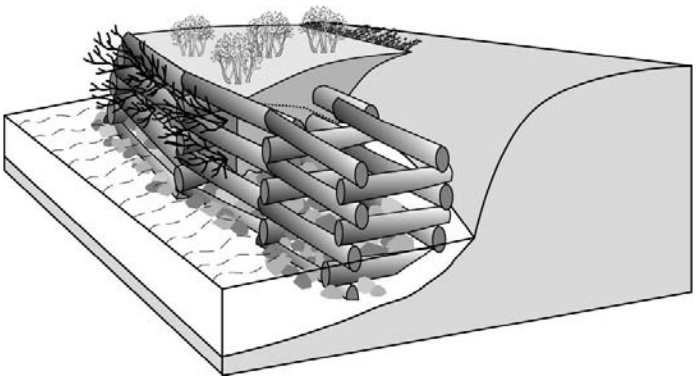

Figure 2-2. Live cribwalls

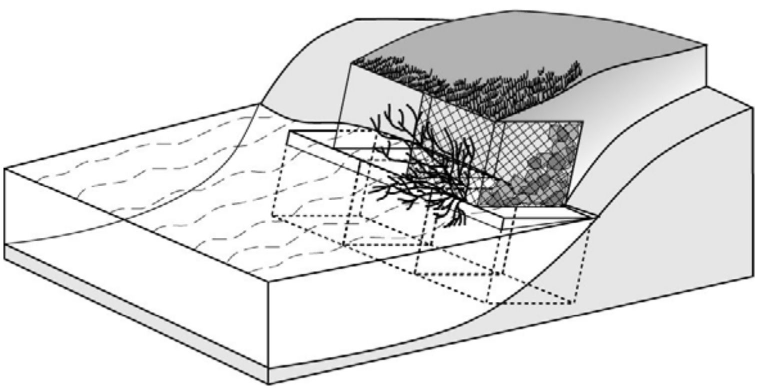

Figure 2-3. Vegetated gabions

Figure 2-4. Sloughing banks

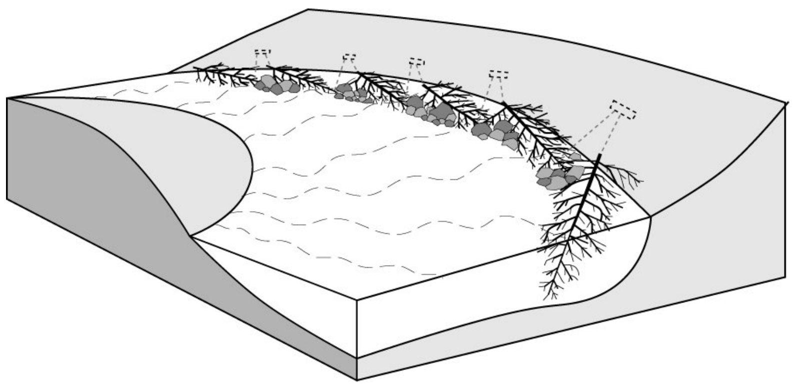

Figure 2-5. Tree revetments

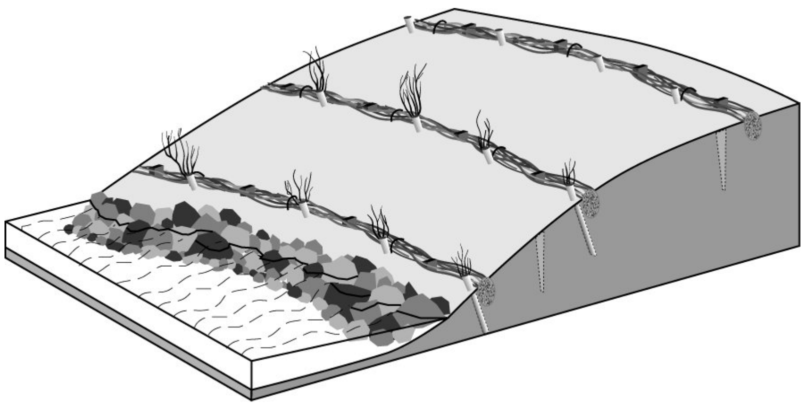

Figure 2-6. Live fascines

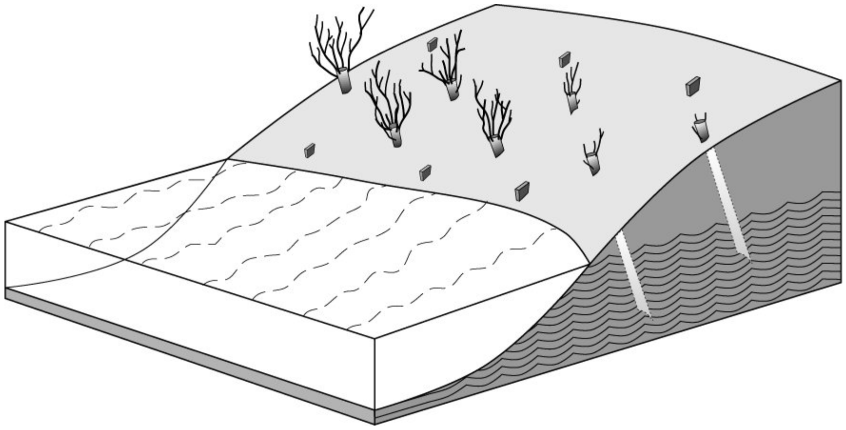

Figure 2-7. Live stakes

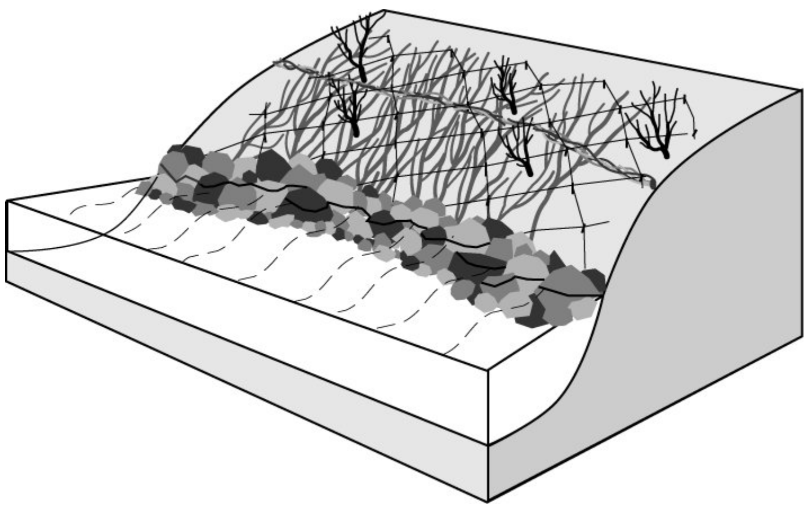

Figure 2-8. Brush mattresses

Figure 2-9. Example of a small hand-placed rock energy dissipater

Bioengineering Advantages

Bioengineering techniques have the following three advantages over standard engineering techniques:

Bioengineering Structures	Standard Engineering Structures
made with natural locally available materials	made from large rocks, concrete, steel, and artificial materials
installed primarily by hand labor, use of standard vehicles, and minimal machinery (Reclamation 2001)	installed by use of heavy equipment (dump truck, front end loader, trackhoe, and backhoe)
used in areas of restricted access	used in areas accessible to heavy equipment

Standard Engineering Techniques

Standard engineering techniques would be used where the channel slope is such that vegetation alone would not likely withstand the expected flow velocities. The number of and exact locations of these structures would be based on professional judgment and consultation and negotiations with individual private and Federal landowners.

Standard engineering techniques used under this alternative could include backfill and riprap armament (figure 2-10) to protect against erosion and upslope plant disturbance in high velocity areas. Minimal concrete and metal components would be used. Heavy equipment would haul and place material; therefore, this method would be limited to locations with easy access. Equipment type and size would be selected to have the least environmental impact. A trackhoe would be used where possible as it would not likely disturb vegetation or surface soils while moving about within the work area or from site to site. Areas of construction would be reseeded or revegetated with live cuttings as needed at individual sites. Some areas could receive both methods to reinforce banks and prevent future erosion. Reclamation would negotiate with individual landowners on a site-specific repair method and whether equipment access rights-of-way would be temporary or permanent.

Figure 2-10. Example of backfill and riprap armament with minimal concrete and metal components

Examples of two locations (figures 2-11 and 2-12) for standard engineering techniques are both outside Reclamation's existing acquired rights-of-way. Following landowner negotiations, Reclamation would acquire an easement from Tyler Creek Road to access the private bridge and middle culvert and would stabilize these structures. Other eroded wasteway sites may also be suitable and considered for standard engineering structures.

Figure 2-11. Middle culvert site where standard engineering techniques would be beneficial

Figure 2-12. Bridge site where standard engineering techniques would be beneficial

Access Road

Route

Reclamation and TID needed wasteway access near the area of considerable erosion. Reclamation, therefore, negotiated with the private landowner and arrived at an acceptable location for a 60-foot-wide access easement approximately 1,700-feet long (figure 2-13). The access road alignment lies within the acquired right-of-way and is positioned, as requested by the landowner, along a relatively flat area skirting a wetlands to avoid cutting an adjacent steep bank. Within this right-of-way, the road is aligned to have the least environmental impact to Schoolhouse Creek, nearby wetlands, and other vegetation.

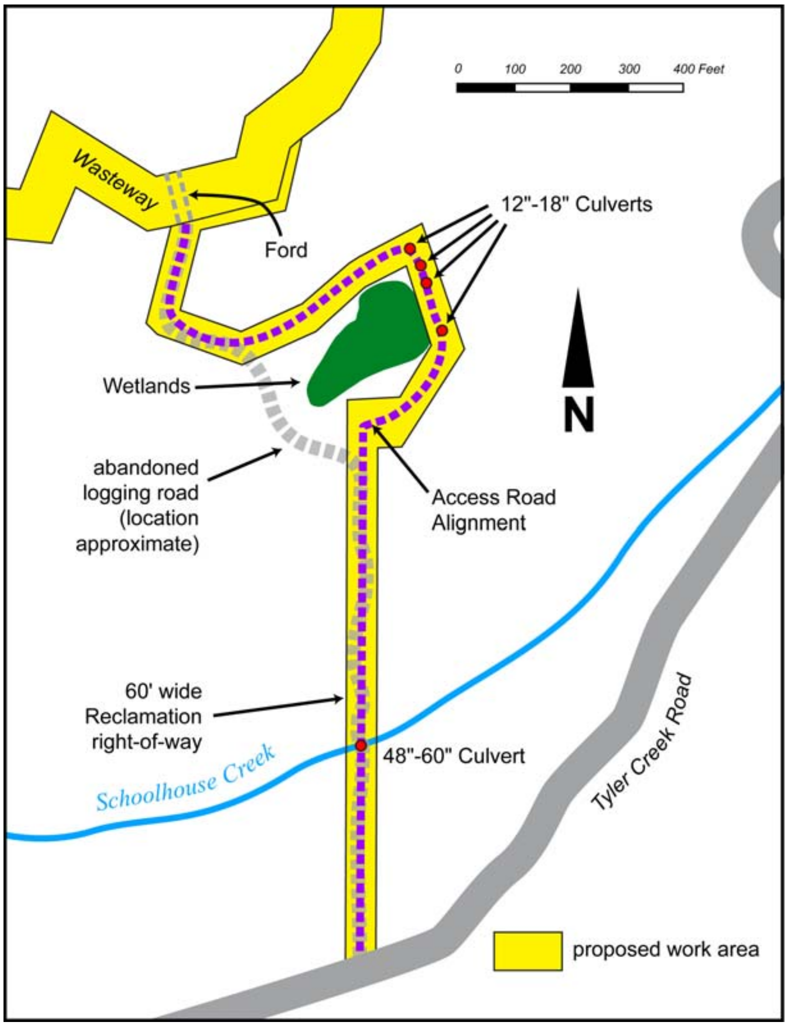

Figure 2-13. Approximate access road alignment

Road Specifications

Two primitive tracks across existing pasture would connect to an abandoned logging road where large trees have already been cleared (figure 2-14). Minimal cut and fill activities would be done on small portions of the road. The access road would be relatively flat except for an area just north of the Schoolhouse Creek crossing which would have a grade between 1 and 2 percent. The road design maintains the natural character of the surrounding landscape rather than paving which could cause oil runoff into the channel. Therefore, neither the existing portion nor new portions of the access road would be paved or graveled (with the exception of some gravel near the culverts). Vehicles could travel over the natural road surface during dry conditions without rutting the surface.

The 12-foot-wide dry weather road would include the following crossing structures:

- a 48- to 60-inch-diameter culvert crossing Schoolhouse Creek
- 12- to 18-inch-diameter culverts crossing small intermittent tributaries to existing wetlands
- a rock or concrete ford crossing the wasteway channel.

Permits would dictate quantities of material to be removed and fill material to be placed. Reclamation would review specifications for existing nearby county culverts and size culverts and crossing structures appropriately for expected runoff, to accommodate use by construction equipment, and to have the least impact on drainage characteristics surrounding the wetlands. These structures would be placed to allow for passage of aquatic species and to not impede flow. Once the culverts were in place, backfill, and then rock, placed around the culverts would improve stability and reduce channel erosion. A graveled road surface near the culverts would reduce sediment movement into the waterway. The exact number of wetland culverts remains to be determined. The Schoolhouse Creek culvert area would be the only graded portion of the access road and would be ramped to allow vehicles to cross over the culvert.

Figure 2-14. The 12-foot-wide primitive dirt road, ungraveled and unpaved, would consist of two tracks across existing pasture and connect to an abandoned logging road

Construction

Road construction would occur during dry weather. Minimal use of heavy equipment (loaded dump truck, front end loader, trackhoe, and backhoe) and disturbance of the area would occur during culvert construction.

Use of the Road

A locked gate would block the entrance of the access road at Tyler Creek Road. Reclamation, its agents, successors, and assigns would perform stabilization efforts, road construction, inspection, and maintenance during dry periods. Should a need arise to access the wasteway during non-dry periods, Reclamation and TID would use foot traffic within the acquired right-of-way. Should a rare instance require immediate vehicular access for emergency stabilization repairs during a wet period, Reclamation would also repair the access road as necessary. The landowner would have unrestricted use of the road regardless of weather conditions.

Vegetation Cuttings and Removal

Along the Wasteway

Cuttings of live brush within existing rights-of-way or with the landowner permission would likely be necessary to construct stabilizing structures. Native vegetation plantings and use of best management practices would reduce the likelihood of introducing noxious weeds. Reclamation would analyze individual erosion sites and negotiate with private and Federal landowners on where vegetation cuttings would be made, from which plants, and whether specific vegetation would be removed. Site-specific conditions, including the presence or absence of habitat and fish species within that site, would be analyzed and efforts made to limit disruption of existing riparian habitat.

Vegetation and live trees within the wasteway channel would likely be removed if the flow around them was causing bank erosion. Live trees would also likely be removed if they were about to fall into the flow channel. Minimal existing vegetation may be removed where concrete and metal components would be placed. Until negotiations took place and specific trees were identified for removal, the diameter, location, and proximity to or within the channel would remain unknown.

Efforts would be made to build stabilizing structures from already downed trees, especially those in the flow channel and along the banks. To avoid cutting live trees, Reclamation would acquire untreated wooden logs if additional logs were needed to build the stabilizing structures.

Workers would remove or realign already downed timber from the wasteway that might direct flows into the channel bank. Other timber would be left or rearranged and anchored in the wasteway to serve as energy dissipaters. Negotiations with the landowner would identify what Reclamation would do with timber removed from the channel and not used in the stabilization efforts. Should slash or debris be created during construction, it would be burned, chipped, or buried on site.

Along the Access Road

A 12-foot-wide band of brush and trees would be removed as necessary from within the entire length of the access road alignment. This would include approximately 8 to 10 scrub oak trees, about 20 to 30 small trees, and small shrub-type vegetation. The road would dodge other trees as much as possible within the right-of-way.

The right-of-way agreement with the landowner stipulates that trees cut for construction of the access road would be laid along the side of the access road for the landowner's use. Slash or debris created during road construction and not used for wasteway bank stabilization would be burned, chipped, or buried onsite.

Proposed Work Sequence

As much as possible, road construction, bank stabilization, inspection, and maintenance would take place during dry periods and when flow is absent from the channel. The proposed work is categorized into three priorities as follows; however, work items within a single priority may not be in chronological order.

First Priorities

- obtain all the necessary environmental clearances and permits
- construct nonexistent sections of the access road
- begin stabilizing actively eroding banks within existing acquired rights-of-way that were damaged by previous wasteway use
- obtain necessary rights-of-way/flowage easements to the private bridge (figure 2-12) and middle culvert (figure 2-11)
- consult and negotiate with individual landowners on stabilization methods to use at the private bridge and middle culvert sites
- stabilize and armor the channel banks at the bridge site
- stabilize and armor the middle culvert site
- periodically inspect stabilized areas
- stabilize the realigned wasteway channel that bypasses the area of considerable erosion (see figure 1-4)
- may do some revegetation in the area of considerable erosion with minimal environmental disturbance

Second Priorities

- obtain all the necessary environmental clearances and permits
- inspect previously stabilized areas and repair as needed
- obtain rights-of-way/flowage easements along the wasteway channel as needed
- consult and negotiate with individual landowners on stabilization at specific sites
- stabilize eroded areas within acquired rights-of-way/flowage easements
- periodically inspect stabilized areas

Subsequent Priorities

Each subsequent year of the stabilization process would begin with inspection and repairs, as needed, of previously stabilized areas. Reclamation would negotiate with individual landowners of those wasteway areas where flow has exceeded the natural channel and caused property damage. Further stabilization would occur on impacted sites over a period of several years depending upon the severity of existing erosion and the potential for future degradation with released flows. Reclamation would assess and repair wasteway areas needing preventative stabilization with the goal of the wasteway performing without further degradation.

Minimizing Construction Impacts

Reclamation would take the following actions to minimize construction impacts:

- complete site-specific environmental compliance
- as much as possible, perform road construction during dry conditions
- avoid rutting the access road by limiting Reclamation and TID's use as much as possible to dry periods
- use foot traffic within the acquired right-of-way when accessing the wasteway during non-dry periods
- in rare emergency requiring immediate vehicular access to make stabilization repairs during a wet period, also repair the access road as necessary
- as much as possible, do stabilization work during dry periods and when flow is absent from the channel
- acquire untreated wooden logs to reduce cutting of live trees if additional logs were needed to build the stabilizing structures
- prevent introduction of noxious weeds
- vegetate with live brush cuttings from within existing rights-of-way
- keep construction debris and rubble out of the stream channel to minimize construction impacts to the downstream fishery
- limit vegetation removal to those plants that:
  - are causing erosion because of their location in relation to the flow,
  - are about to fall into the flow channel, or
  - are located where standard engineering structures would be placed to reduce bank erosion
- construct waterbars on the access road as necessary to prevent rutting and washing of surface materials

Inspection and Maintenance

Stabilization would be an ongoing effort for several years. Bioengineering techniques are dependent upon plant growth which is dependent upon soil type, precipitation, temperature, insect damage, wildlife damage, etc. Therefore, Reclamation and TID would perform annual inspections of the wasteway each spring, during and after wasteway use, and after high precipitation events. Inspectors would walk the entire length of the wasteway to identify sites of new erosion or potential erosion sites needing stabilization. Continual inspection during the first few years and replacing dead planted vegetation would enhance bank protection. Early intervention, before extensive erosion occurs, using bioengineering structures at these sites would increase the effectiveness of the stabilization efforts. Standard engineering structures would be inspected prior to, during, and after periodic releases through the wasteway and repaired as necessary. The routine inspection would include taking water measurement readings from the weir at the pipe outlet.

Reclamation and TID would perform annual inspection of the access road in early summer and after spring runoff and high precipitation events. Active road erosion would be corrected with necessary modifications such as water bars or relocation of culverts. The landowner would likely continue to use the road corridor for pasture; therefore, cutting of vegetation along the centerline of the road would not be necessary.

Should a need arise to access the wasteway during non-dry periods, Reclamation and TID would use foot traffic within the acquired right-of-way. Should a rare instance require immediate vehicular access for emergency stabilization repairs during a wet period, Reclamation would also repair the access road as necessary. The landowner would have unrestricted use of the road regardless of weather conditions.

Alternative 3 – Bioengineering Only

Alternative 3 would use only bioengineering techniques to stabilize localized eroded areas of the wasteway banks and upslopes regardless of whether a standard engineering technique would be considerably more effective and reliable.

Rights-of-Way/Flowage Easements, Negotiations, and Data Collection

Data collection, negotiations, and acquisition of rights-of-way/flowage easements would be accomplished in the same manner as described for alternative 2 (the preferred alternative), except that no standard engineering structures would be built.

Bioengineering Techniques

This alternative would be 100 percent bioengineering techniques, similar to those described for alternative 2. The one difference is that rather than installing standard engineering structures in areas of high velocity, some of the more sturdy bioengineering structures (such as live cribwalls and vegetated gabions) could be installed in those areas.

Access Road

An access road would be constructed from Tyler Creek Road to the wasteway and secured from public access as described for alternative 2. The landowner would have unrestricted use of the road.

Vegetation Cuttings and Removal

Vegetation cuttings and removal would occur as described for alternative 2.

Proposed Work Sequence

The work sequence for this alternative would be the same as for alternative 2, except that no standard engineering structures would be built.

Minimizing Construction Impacts

Reclamation would take the same actions to minimize construction impacts as described for alternative 2.

Inspection and Maintenance

Reclamation and TID would inspect the access road and wasteway channel each spring and during and after released flows or after high precipitation events as described for alternative 2, except that no standard engineering structures would be built, inspected, or maintained.

Alternative 4 – Standard Engineering Only

Alternative 4 would include treating localized eroded portions of the wasteway with liberal use of backfill, lining, and armoring of the slopes using concrete, concrete revetments, and riprap. This alternative would likely exclude the use of vegetation regardless of whether bioengineering techniques would suffice.

Rights-of-Way/Flowage Easements, Negotiations, and Data Collection

Data collection, negotiations, and acquisition of rights-of-way/flowage easements would be accomplished in the same manner as described for alternative 2 (the preferred alternative), except that there would be no live brush cuttings and no need to determine vegetation species since bioengineering techniques are not included in this alternative. This alternative would, however, include additional access rights-of-way at many locations off Tyler Creek Road into the wasteway and the widening of the existing wasteway rights-of-way.

Land survey data would assist engineers in designing appropriate standard engineering structures for individual sites and determining the quantity and type of construction materials most appropriate for that site.

Standard Engineering Techniques

This alternative would be 100 percent standard engineering techniques likely involving concrete, metal, and artificial components. Installation would require heavy equipment (loaded dump truck, front end loader, trackhoe, and backhoe) to haul and install large boulders, prefabricated structures, and other construction materials; therefore, additional access would be needed into and along the wasteway. Stabilization work would continue as needed on impacted sites depending upon the severity of existing erosion and the potential for future bank degradation with released flows.

Access Roads

An access road would be constructed from Tyler Creek Road into the wasteway within the acquired right-of-way (figure 2-13) and would be secured from public access the same as described for alternative 2. The culvert sizes would be the same as described for alternative 2. One difference in this alternative is that this road would likely be extended paralleling the wasteway short distances both upstream and downstream as the terrain would allow without major environmental disturbance.

Since standard engineering techniques would require the use of heavy equipment for hauling material and installation, many other access roads off Tyler Creek Road into localized areas of the wasteway would be needed. These roads would also be gated to prevent public access. Equipment, in some locations, could then travel cross country to stabilization sites without building a road if the terrain and vegetative growth would permit passage.

The steep terrain in some localized areas would dictate that materials be hauled in and structures built without the aid of heavy equipment. Additional manual labor would likely be needed.

Use of the access roads would be the same as described in alternative 2.

Vegetation Removal

Along the Wasteway

This alternative would include removal of local vegetation from throughout the wasteway channel and replacement with standard engineering structures of concrete and metal components. Vegetation in the way of these structures would be removed. Reclamation would analyze individual erosion sites and negotiate with private and Federal landowners on whether specific vegetation would be removed. In particular, vegetation and live trees within the wasteway channel would be removed if the flow around them was contributing to bank erosion. Live trees would be removed if they were about to fall into the flow channel. This alternative would likely include extensive removal of willow (*Salix* spp.), snowberry (*Symphoricarpos* spp.), alder (*Alnus* spp.), currant (*Ribes/Rubus* spp.), sedge (*Carex* spp.), various forb/grasses, and other vegetation as described on table 3-1. Until landowner negotiations took place and specific trees were identified for removal, the diameter, location, and proximity to or within the channel would remain unknown.

Workers would remove or realign already downed timber from the wasteway that might direct flow into the channel bank. Other timber would be left or rearranged and anchored in the wasteway to serve as energy dissipaters. Negotiations with the landowner would identify what

Reclamation would do with slash or debris created during construction and timber removed from the channel.

Along Access Roads

Vegetation removal would be similar to that described for the access road in alternative 2, except that additional roads for alternative 4 would require additional vegetation removal. The roads would dodge trees as much as possible within the rights-of-way. Disposal of cut trees, slash, and debris created during construction of the roads would comply with negotiated agreements with private and Federal landowners.

Proposed Work Sequence

The work sequence for this alternative would be similar to alternative 2, with a couple of exceptions. The area of considerable erosion would not be revegetated. Since live vegetation would not be planted in this alternative, stabilization efforts would take less time, likely spanning a couple of years. Once a standard engineering structure was placed, that area should be stabilized.

Minimizing Construction Impacts

Reclamation would take the following actions to minimize construction impacts:

- complete site-specific environmental compliance
- as much as possible, perform road construction, stabilization efforts, inspection, and maintenance during dry conditions
- avoid rutting the access roads by limiting Reclamation and TID's use as much as possible to dry periods
- use foot traffic within the acquired right-of-way when accessing the wasteway during non-dry periods
- in rare emergency requiring immediate vehicular access to make stabilization repairs during a wet period, also repair the access roads as necessary
- perform stabilization when flow is absent from the channel
- keep construction debris and rubble out of the stream channel to minimized construction impacts to the downstream fishery

Inspection and Maintenance

Reclamation and TID would inspect the access roads and the standard engineering structures by walking the entire length of the wasteway channel to identify sites of new erosion or potential erosion sites needing stabilization. These inspections would take place each spring and during and after released flows or high precipitation events. Wasteway repairs would be made as needed to prevent erosion or degradation of the structures. Standard engineering structures would require less maintenance than bioengineered structures. Active road erosion would be corrected with necessary modifications such as water bars or relocation of culverts. The routine inspection would include taking water measurement readings from the weir at the pipe outlet.

Reclamation, its agents, successors, and assigns would perform stabilization efforts, road construction, inspection, and maintenance during dry periods. Should a need arise to access the wasteway during non-dry periods, Reclamation and TID would use foot traffic within the acquired right-of-way. Should a rare instance require immediate vehicular access for emergency stabilization repairs during a wet period, Reclamation would also repair the access roads as necessary.