

VI. Measures to Minimize Harm

The FHWA is committed to the following measures to minimize harm for the proposed Guanella Pass Road project.

A. CULTURAL RESOURCES

Because Leavenworth Mountain is the backdrop to the historic setting of the Georgetown-Silver Plume National Historic Landmark District (GSPNHLD), it has been determined that any improvement of the switchbacks on the existing roadway will adversely affect the visual quality of the cultural landscape within the District. Proposed improvements will entail tree removal, cuts and fills, and retaining walls within the existing roadway construction limits. The FHWA has determined that there will be an adverse effect to the GSPNHLD under all build alternatives.

Measures to minimize harm for impacts to the visual quality of the cultural landscape on Leavenworth Mountain are the same measures listed in the Visual Quality section, below, and are included in a Memorandum of Agreement (MOA) among the FHWA, State Historic Preservation Officer (SHPO) and Georgetown (refer to **Section VI.E: Visual**, below, and **Appendix D**).

The Town of Grant (Site # 5PA403) is outside the project area of potential effect and the proposed project will not affect it. However, archeological monitoring of construction activities will be conducted along Guanella Pass Road in the vicinity of Grant to determine if there are subsurface archeological deposits that cannot be observed from the surface.

The proposed Guanella Pass parking area will not adversely impact site #5CC70, an open lithic scatter site. However, given its proximity to the proposed parking area, temporary barrier fencing will be erected between Site #5CC70 and the new parking area during construction operations.

B. TRADITIONAL CULTURAL PROPERTIES

Although no impacts to traditional cultural properties are anticipated, undocumented cultural sites could be encountered during construction. Impacts will be offset by the following measures to minimize harm developed through interviews with Native Americans.

If human remains, associated burial items, sacred items, or items of cultural patrimony (Native American Graves Protection and Repatriation Act [NAGPRA] items) are found on Federal lands during project activities, construction activities in those areas will be halted, and the Ute tribes will be consulted regarding treatment and disposition in accordance with guidelines set forth in the NAGPRA. Human burials will be avoided and not moved until consultation with the SHPO and tribes is complete. If a gravesite is discovered on private land, the local coroner and sheriff's department will be consulted before construction continues.

The FHWA will advise Native American contacts of the project construction schedule and allow interested individuals an opportunity to monitor project construction.

C. WATER QUALITY

Impacts to water quality will be mitigated with the following measures:

- Adequately sized and more frequently spaced culverts will be added to the road and existing culverts replaced to restore the natural stream channel and to prevent draining water from gathering momentum, thereby reducing erosion.
- Energy dissipaters will be used at culvert outlets.
- Where practical, culverts will be placed so that the outlet discharge is buffered by riparian zones/wetlands before reaching a stream.
- Permanent erosion control structures will be constructed where appropriate. Types of structures include check dams, settling basins, and sediment traps. Maintenance of these structures will be the responsibility of the road maintaining agencies, i.e., Clear Creek and Park Counties and Georgetown.
- Existing erosion problem areas will be repaired by resurfacing the roadway, improving drainage, and revegetating and stabilizing slopes.
- A revegetation plan will be developed and implemented for disturbed areas in coordination with the FS.
- Where the road encroaches into a stream, special treatments will be provided for controlling and directing sediment away from environmentally sensitive areas. The special treatments will include, as appropriate, sediment traps, berms, furrow ditches, seeding, matting, revegetation, insloping, and/or paved (armored) ditches. Design efforts will focus on providing improvements to areas designated as priority 1 or 2 by the FS in the report: *Sedimentation Problems Identified on the Guanella Pass Road, Aquatic and Soil Resource Recommendations* (Arapaho-Roosevelt National Forest 2001).
- Flatter slopes will be used where practical to promote revegetation.
- The Best Management Practices (BMPs) detailed in *Best Management Practices* (FHWA 1998) will be applied.
- Temporary erosion control measures such as settling basins, straw bales, silt fence and excelsior logs will be in place during construction to minimize erosion.

D. WETLAND AND RIPARIAN COMMUNITIES

Measures to minimize harm for wetland and riparian impacts will include:

- Avoiding wetlands to the greatest extent practical.
- Minimizing impacts to wetlands as final plans are developed and alignments are adjusted to reduce impacts, where practical.
- Storing equipment and construction materials away from wetland and riparian areas.

- Placing temporary fencing or barriers and enforcing regulations that prevent contractors from working outside established construction limits to protect wetlands and other areas such as sensitive plant and animal habitat from accidental construction equipment encroachment.
- A wetland mitigation plan will be prepared in coordination with the FS and the USACE. During a field review in coordination with the USACE and EPA, the old Geneva Basin Ski Area parking lot was found to be the most favorable potential site for wetland mitigation. This site will support a montane wetland/riparian complex similar to affected wetlands. Other sites will be considered as well, such as reclamation of wetlands where the road alignment is shifted to avoid two crossings of Duck Creek. Wetland banking is no longer being considered because mitigation near the roadway appears to be feasible.

Additional measures to minimize harm for wetland and riparian communities that protect them from sedimentation are included in the measures identified for water quality.

E. VISUAL

Guanella Pass Road is a designated Colorado Scenic and Historic Byway and a National Forest Scenic Byway. The selected alternative will not detract from the beauty of the Byway. To minimize visual impacts, the selected alternative for Guanella Pass Road will:

- Minimize tree removal.
- Use retaining walls in select locations to minimize cut and fill slopes. Where the walls will be clearly visible, the design materials used in the retaining walls will be natural-looking treatments such as concrete form liner or dry stacking of real stone to improve the visual quality of the roadway and will attempt to blend with the forest and adjacent natural materials.
- Minimize cut slopes where possible. Where cut slopes are necessary, they will typically not exceed a 50 percent (27 degree) slope. A 30 percent (18 degree) slope is preferable to increase the probability of revegetation.
- All guardrails will have a natural appearance design (timber, naturally weathered rail, or other materials).
- All signposts and sign backs will be dark brown in color.
- Where appropriate, exposed rock will be stained where cuts occur into bedrock in visually sensitive areas. This will minimize the stark color contrasts of very lightly colored freshly cut rock with the dark background of the forested mountainside.
- Blast in such a way as to avoid the defined, vertical drill holes that sometimes result. Explosives will be used in such a way that the faces of the rock outcrops are fractured, imitating a natural appearance.
- Implement landscaping and revegetation on all abandoned roadway segments and adjacent disturbed land that is capable of sustaining vegetation. Revegetation of trees and shrubs will be as close as practical to the new roadway without compromising safety.

- Stabilize and revegetate existing barren slopes as practical using native vegetation techniques and techniques similar to those developed for areas of new disturbance.
- Use the Guanella Pass Scenic Byway Corridor Management Strategy (CMS) as a guide for enhancing the visual quality of the roadway. Where possible, the strategies in the CMS to preserve the rural and rustic character of the Guanella Pass corridor will be implemented to maintain consistency between the CMS and the project. Some of the visual strategies include creating a buffer zone between formal parking areas and the roadway and softening the effects of the presence of the road in the environmental setting.

During the final design phases of the project, the FHWA will conduct a workshop(s) to evaluate options for retaining walls and guardrail materials. The FHWA will coordinate the selection of the materials for these accompanying roadside structures with the cooperating agencies.

F. RECREATIONAL RESOURCES

The FHWA, in cooperation with the FS, will provide additional recreational elements such as pullouts, interpretive stops, scenic vista points, parking areas, and access and parking for hiking, fishing and picnic areas. Also, vehicle access and parking at specific sensitive locations designated by the FS will be restricted by using earthwork grading, boulder placement, guardrails, signs, and other techniques. The project formalizes established parking areas considered appropriate by the CMS and discourages use of non-formal parking. This will alleviate some of the problems of inappropriate use and overuse.

A unified signage system along the road will provide a consistent, high-quality design element to the road and will provide useful information to visitors. Interpretive signs will be located throughout the project at appropriately sized pullout and roadside parking locations identified in the CMS. Interpretive signs developed in concert with the CMS plan will provide information about the natural environment and recreation opportunities in the area. They will also educate people about ways to minimize environmental impacts from recreational uses.

The FHWA will research and install warning signs or other technologies to lower operating speed between Grant and Falls Hill (Stations 1+000 to 9+380)

To mitigate the potential for increased hazard to bicyclists, horseback riders, and pedestrians using the roadway, regulatory and warning signs will be provided to discourage excessive vehicle speed, and to advise of roadway locations requiring slower speeds. For example, equestrian crossing signs will be placed at the top and bottom of Falls Hill.

The FHWA, in coordination with the FS, will reconstruct the horse trail above the Scott Gomer Creek Falls switchback and will construct a horse trail from the Whiteside Campground to the Three Mile Trail head with a bridge over Geneva Creek. The FHWA will coordinate the details of the location and design with Tumbling River Ranch.

During final design, the FHWA will research and determine eligibility to pay for safety control items that assist in law enforcement and heighten speed control.

G. PLANTS AND ANIMALS

Conservation measures consistent with the goals, standards, and guidelines established in the Forest Plans will be coordinated with the FS, the Colorado Division of Wildlife (CDOW), and USFWS. These measures will become elements of the construction plans and specifications.

1. Threatened, Endangered, and Candidate Species

This section contains measures minimize harm to the federally listed Canada lynx (threatened), and the Federal candidates for listing: boreal western toad and Porter's feathergrass (both are also FS sensitive).

Canada Lynx: Existing forest cover along the road between Guanella Pass Campground and Geneva Park will be maintained to the maximum extent possible.

The road will be designed to prevent parking in undesignated locations.

Parking lot construction activity at Guanella Pass will be prohibited during dawn, dusk, and nighttime hours.

Slope stabilization and revegetation specifications will be developed in coordination with the FS to reestablish tree and shrub cover as close to the reconstructed road as is consistent with site characteristics and safety.

Borrow site activity will be restricted to daylight hours.

Borrow sites will be contoured and revegetated.

Guardrail types and materials will be used that do not impede sight of the road from the shoulder for animals, except within the limits of the Town of Georgetown, where solid walls (guardwalls) are proposed for aesthetic reasons.

Retaining wall sections will be designed with a bench between the guardrail and the edge of the wall so that an animal can pause before proceeding.

Proposed retaining wall sections will be evaluated during final design to minimize the length of continuous walls higher than 1 m (3 ft) in potential lynx crossing areas. Field inspections will be held in coordination with the USFWS, CDOW, and the FS to examine locations where retaining walls are planned near potential lynx crossing areas. This data will be used to develop site-specific input for final design. Emphasis will be placed on locations such as 17+870 and 23+560, where only short gaps are currently planned between relatively long sections of retaining wall.

If a lynx is killed in the project area, the FHWA will, within 24 hours, notify the State Service law enforcement office at (303) 274-3560, and assist in making arrangements to transport the carcass to the appropriate State, Federal, or Tribal Wildlife agency so that biological information can be collected. The CDOW will also be contacted at (970) 472-4310.

In addition to the above measures, the FS has committed to the following measures that fall within its jurisdiction:

- The west-side parking lot and access road at Guanella Pass will be closed to winter use.
- Overnight camping closer than 0.8 kilometers (0.5 miles) to the Guanella Pass parking lot will be prohibited.
- The trail on the west side of Guanella Pass will be reconstructed to eliminate braided sections in nearby willow habitat.
- The FS will promote use of system trails only through design and interpretation.
- The FS will retain future options of modifying management to protect lynx or other potentially occurring listed species.

Boreal Toad: Additional adjustments to the road alignment adjacent to occupied and potential habitat will be made during final design.

Design will include measures to minimize potential hydrologic impacts to wetlands in areas identified as boreal toad habitat such as culvert outlet flow dissipaters.

Specific segments (Stations 25+000 to 31+500 and Stations 21+000 to 23+000) of the road will be evaluated to determine where drift fences could be used to encourage toads to cross the road through culverts or tunnels. Both CDOW and FS personnel will be requested to attend design field reviews to help determine the location of these drift fences and to coordinate any additional measures that may be identified at that time.

Porter's feathergrass: The FHWA will identify construction boundaries from Stations 9+100 to 9+700 using temporary fencing. Special provisions will be included in the construction contract regarding this area, including penalties for transgression of the construction boundary.

2. Forest Service Sensitive Species

This section contains measures to minimize harm to a specific FS sensitive animal or plant species.

Boreal owl: Nighttime surveys for boreal owls will be conducted one year prior to construction work in full reconstruction areas in mature conifer habitats. The FHWA will coordinate as appropriate with the FS concerning scheduling of construction activities.

Northern Goshawk: Protocol surveys will be conducted during May – June of the year prior to construction to identify goshawk use areas (for contracting information), and follow-up same-year (as construction) surveys in the identified use areas to determine whether scheduling of construction activities is needed to avoid nesting/foraging territories during May-August. Restrictions will be determined in coordination with the FS.

Reflected moonwort: The FHWA will mitigate impacts to reflected moonwort with a transplanting effort of up to six sites in coordination with FS botanists. Undisturbed gravelly roadside sites will be identified and used as recipient sites.

Northern blackberry: To protect the blackberry, the FHWA will identify construction boundaries from Stations 9+100 to 9+700 using temporary fencing. Special provisions will be included in the construction contract regarding this area, including penalties for transgression of the construction boundary.

Weber's monkeyflower: The FHWA will identify the sensitive area for the construction contractor and the contractor will be required to stay within the construction limits. Special provisions will be included in the construction contract regarding this requirement, including penalties for transgression of the construction boundary.

3. Forest Service Management Indicator Species

This section contains measures to minimize harm for those FS Management Indicator Species where measures are proposed for a specific animal or plant. Also included is the rare Colorado endemic species: Colorado Rocky Mountain Columbine.

Ptarmigan: In the future, interpretive and informational signs will be provided to educate visitors of the sensitivity of the ptarmigan.

Bighorn sheep: Warning signs will be provided to minimize impacts to bighorn sheep in the Geneva Creek Canyon and elsewhere along the road where conflicts exist between roadway traffic and bighorn range use.

Elk: Warning signs will be provided to address the potential conflict at the elk crossing in Geneva Park.

Rocky Mountain columbine: If impacts cannot be avoided, the FHWA will consult with the FS to determine appropriate measures, which could include a transplantation effort if practicable.

4. Plants and Animals in General

Establish native vegetation on all disturbed areas capable of supporting vegetation using modern revegetation materials and techniques. A comprehensive revegetation plan will be developed in coordination with the FS and the local weed control officer. The revegetation plan will be consistent with the Arapaho-Roosevelt National Forest Revegetation Policy.

Evaluate the slopes in the rehabilitation sections of the selected Alternative 6 on a site-by-site basis with the cooperating agencies to determine where it is feasible to repair the slopes to promote revegetation and reduce sedimentation and erosion.

Certify that revegetation plant mixes are weed-free.

Develop slope stabilization and revegetation specifications to reestablish tree and shrub cover as close to the reconstructed road as is consistent with safety and site characteristics.

Develop wetland mitigation that address wetland habitat replacement needs for wildlife species that use wetlands as habitat.

Clear wetland and riparian habitats prior to the onset of the nesting season, which avoids or minimizes the take of migratory birds and reduces local impacts to species that nest in the construction areas.

Include measures to minimize harm to riparian areas in the revegetation plan developed in coordination with the FS.

Conduct surveys along the entire road corridor for raptors in the year prior to construction. The purpose is to identify areas that will need restricted construction periods and therefore need to be identified in the construction contract.

Schedule construction activities to minimize impacts to sensitive species.

Wash construction equipment before it enters the project to reduce the chance of introducing foreign weed seeds to the ecosystem.

Certify that all imported fill or aggregate material is weed-free.

Encourage reduced speeds with rough-textured surfaces and regulatory and warning speed control signs and at kiosks.

Construct creek crossings with natural bottom culverts and construct oversized culverts in appropriate areas to allow passage of fish, amphibians, reptiles, and small mammals.

Use techniques in the longer stretches of retaining walls that will allow large mammal passage.

The FS will review preliminary design plans and provide feedback regarding measures to minimize harm to specific wildlife species.

H. CONSTRUCTION

The following mitigation steps will be followed for construction activities. Measures to minimize harm for potential construction impacts to water quality are included at the end of this section.

1. General Construction Measures

All applicable zoning and other local regulations apply, as well as the *Standard Specifications for Construction on Roads and Bridges on Federal Highway Projects* (FHWA 1996). The contractor will be required to keep work areas in an orderly condition, to dispose of all refuse properly, and to obtain permits for the construction and maintenance of all construction camps, stores, warehouses, latrines, and other structures in accordance with applicable requirements. No food or trash will be stored in a location accessible to scavengers.

The contractor will use only approved portions of the right of way for storing material and placing plants and equipment, and cannot use private property for storage without written permission of the owner.

The contractor will comply with all legal load restrictions when hauling material and equipment on public roads to and from the project. Special provisions will be included in the construction

contract regarding the contractor's responsibility for damage resulting from the moving of material or equipment.

Safety to the public, in particular pedestrians, bicyclists, and equestrians, will be the highest priority. Construction-related traffic must follow speed limits and other applicable laws. Work will be performed in a manner that assures the safety of the public and protects the residents and property adjacent to the project. The roadway will be maintained in a safe and acceptable condition, including periods when work is not in progress. The contractor will maintain intersections with trails, roads, streets, businesses, parking lots, residences, garages, and other features.

The FHWA will provide safe access through the construction zone for horseback riders and guests at all times and maintain the existing horse trail through Falls Hill during construction. Construction activities will be coordinated with local outfitters. Permanent horse crossing signs will be installed at the top and bottom of Falls Hill.

For delays longer than 30 minutes, public notice will be given in advance through the local news media and by informational signs. The road will be kept open on weekends without construction delays from 6:00 p.m. Friday to 11:00 p.m. Sunday and on national holidays.

Traffic management efforts will be coordinated with local businesses, residents, Xcel Energy, etc. to ensure their involvement prior to and during all construction activities. The road will not be closed during the peak aspen viewing period. Local businesses and residents will be informed of construction activities (road closures, traffic delays, etc.).

Emergency service providers will be given up-to-date information on construction schedules, anticipated delays, and locations. The contractor will be required to provide immediate passage through the construction for all emergency service vehicles to the extent practical.

The FHWA will discuss the timing of construction activities in sensitive areas (i.e. near businesses or residences) with Clear Creek County, Park County, the Town of Georgetown, the FS, the CDOT, and local businesses and residents that regularly use the road. Construction activities in sensitive areas will be minimized, or timed, to the extent practical such that there is minimal impact on the surrounding community.

No construction activities or aggregate material hauling will take place from Memorial Day through Labor Day from approximate Stations 1+000 to 12+000 (Grant to Duck Creek Campground). From Memorial Day to Labor Day unimpeded road access will be provided from Grant to the Tumbling River Ranch. Limited construction and controlled construction traffic will be allowed in May and September. This construction will entail minor traffic delays. From Labor Day to Memorial Day, construction activities, including aggregate hauling, in the vicinity of Tumbling River Ranch (Stations 6+500 to 7+000) will only occur from 7:00 a.m. to 7:00 p.m. The majority of the construction activities (e.g. most of the grading, drainage, retaining walls) at Falls Hill (Stations 7+000 to 9+380) will be sequenced to occur from October 1 through May 1, and the FHWA will notify Tumbling River Ranch of construction in this area and coordinate with them to try to minimize disruption to their business.

If Tumbling River Ranch provides a schedule of travel times across Guanella Pass, the FHWA will try to meet reasonable requests for unimpeded travel. Such scheduled travel will be accommodated to the maximum extent practicable with as little delay as possible.

The project area will be left in good condition over the nonworking seasons.

The FHWA and the FS are committed to a continuous and open communication and coordination with Clear Creek County, Park County, the Town of Georgetown, the FS, the CDOT, and affected property owners throughout the duration of the final design and construction of the project. Construction activities will be communicated with all adjacent landowners. The Project Engineer will notify Tumbling River Ranch of all construction activities (road closures, extended traffic delays, timing of construction, etc.) that may affect the business operations of the Ranch. The Project Engineer will maintain a close line of communications with all parties that are directly affected by the construction.

Timing and location of construction operations will need to be scheduled to minimize effects to fish and wildlife. Seasonal restrictions will be based on pre-construction surveys and coordination with wildlife agencies. This is also noted in **Section VI.G: Plants and Animals**, above.

Construction equipment will be washed before entering the National Forest system lands to reduce the chance of introducing foreign weed seeds to the ecosystem. In addition, all imported fill or aggregate material and revegetation plant mixes will be certified weed-free.

Areas in Geneva Park will be temporarily fenced to protect rare plant areas.

The contractor will maintain a reasonably dust-free traveled way. Accumulations of soil and other material will be removed from the traveled way.

All fences, gates, and wall that need to be removed or are damaged as a result of the construction project will be replaced in kind.

2. Hauling

Material sources will be developed within the Guanella Pass Road corridor to reduce the amount of construction truck traffic. The material source locations include the FS land near Duck Lake and the Geneva Basin Ski Area parking lot. These areas have been found to possess material of good quality for use in road construction. The material source site at Duck Lake will only serve the sections from the Forest Boundary (Station 7+000) northward. Aggregate placed from Grant to the Forest Boundary (Station 1+000 to 7+000) will come from commercial sources on the Grant side of the project.

From approximate Stations 1+000 to 12+000 (Grant to Geneva Campground), no aggregate material hauling will take place from Memorial Day through Labor Day. To the extent practical, materials that can be stockpiled in advance of construction will be hauled to staging areas between October 1 and May 1. Hauling of other construction materials including fuel, asphalt cement, culvert pipes, retaining wall material, and machinery will need to be done throughout the year. The Project Engineer will notify Tumbling River Ranch on a daily basis from Memorial Day through Labor Day and a weekly basis the rest of the year about construction hauling traffic that travels through Grant. The FHWA will coordinate the limited hauling activities from Memorial Day through Labor Day to avoid conflict with Ranch activities to the extent possible.

Argentine/Brownell Street in Georgetown will be used as a construction haul route. Roads within the Town of Georgetown that are on construction haul routes will be repaired. The

repairs will include milling the existing asphalt surface to an appropriate level, repaving the surface, and improving the drainage elements (curb and gutter) to ensure that they are in equal or better condition after construction. The FHWA agrees to move Argentine/Brownell Street to the west one roadway width from 15th Street to just before 11th Street. Additionally, the FHWA will build a bridge at 7th Street to route construction traffic through town. See **Section VI.I.4: Town of Georgetown – Construction Impact Measures**, below, for more detailed information.

Notification concerning construction hauling traffic will be given to the Town of Georgetown, Clear Creek County, Park County, and businesses and property owners along the road and haul route on a daily basis from Memorial Day through Labor Day and on a weekly basis the rest of the year. Any limited hauling activities occurring between Memorial Day and Labor Day will be coordinated to avoid conflicts as much as possible with business activities along the road.

Staging areas will be developed within the Guanella Pass Road corridor to reduce the amount of construction truck traffic. These areas include the Geneva Basin Ski Area parking lot and other existing disturbed areas (pullouts, dispersed recreation parking areas, etc.). In addition, any new parking areas could be used for staging while they are under construction.

With the exception of materials from the on-site materials sources, material for the Clear Creek County construction will be hauled in from the Clear Creek County side of the pass and material for the Park County construction will be hauled in from the Park County side of the pass.

3. Water Quality Control Measures

Under the build alternatives, several measures will be implemented to minimize erosion and sediment runoff. Temporary erosion control measures (e.g., mulches, fiber mats, hay bales, silt fences, rock lining, rock buttresses, riprap, catch basins, water deflectors, berms, dikes, cofferdams, temporary culverts, slope drains, sodding, etc.) will be used during construction to limit erosion and resultant sediment and water pollution. To comply with National Pollutant Discharge Elimination System (NPDES) requirements, an erosion control plan identifying those measures to be used will be incorporated into the project design plans. This plan will be used as the basis for protecting the project from erosion during construction. The contractor will be required to incorporate all permanent erosion control features into the project at the earliest practicable time. No work will be started until the necessary controls are installed.

For soil erosion control, the contractor is required to apply temporary vegetation establishment or other approved measures on disturbed areas that will remain exposed for over 30 days, construct and maintain erosion controls on and around soil stockpiles to prevent soil loss, shape earthwork to minimize and control erosion from storm runoff after each day's work, inspect all erosion control facilities at set intervals, and maintain temporary erosion control measures in working condition until the project is complete or the measures are no longer needed. There are also specifications for topsoil, fertilizer, mulches, seed and other plant materials, erosion control mats, tackifiers, sod, straw bales, silt fences, geotextiles, etc.

The contractor will be required to designate an individual, other than the contractor's superintendent, whose primary responsibility is to serve as the Environmental Commitments Supervisor for the duration of the project. The Environmental Commitments Supervisor's responsibilities include directing the implementation of effective erosion/sediment control measures to control construction site drainage and water quality; directing the construction, operation, and dismantling of temporary erosion control features; being available to modify site drainage and implement storm and winter shutdown procedures; and assuring that all measures

to minimize harm are being implemented and adhered to by the contractor. Winter shutdown procedures will be included in the erosion control plan.

The project specifications will limit the area of excavation, borrow, grading, and embankment operations commensurate with the contractor's capability and progress in accomplishing finished grading, mulching, seeding, and other erosion control measures. All available topsoil will be stripped, stockpiled, and placed on new slopes. Fertilizer (where appropriate), seed, and mulch will be placed on all cut and fill slopes capable of sustaining vegetation. Because several successive construction projects will be required to complete the route, the success of revegetation efforts will be evaluated by the cooperating agencies to determine whether additional revegetation work is needed. Additional work will be included in successive project contracts and revegetation procedures modified for these contracts.

Erosion control structure specifications will be included in the contract plans. The FHWA's project engineer and the contractor will resolve unanticipated erosion problems that develop during construction. The Counties will do continued maintenance of permanent erosion control structures after construction. During construction this will be the responsibility of the contractor.

Several techniques for erosion control will be used. Silt fences will be typically used to filter sheet flows coming from the project site. They will be installed along the downslope or sideslope perimeter of the area of disturbance. Silt fences will also be used where the roadway is close to a stream, wetland, or other body of water.

Temporary diversion ditches (soil cut out into a channel) will be used above new cut slopes, where appropriate, to divert clean surface flows away from disturbed areas. The flows will either be directed away from the project site, or directed to a temporary culvert that will allow the flow to pass through the work site without additional contamination.

Temporary berms (soil formed into a barrier) will be used along the top of unstabilized embankments where appropriate to collect water from the exposed grade. An outlet or temporary slope drain will then be provided at regular intervals to outlet the flow to a sediment trap or other sediment trapping measure.

Permanent pipe culverts that originate from within the disturbed area will have silt fence, straw bales, a gravel filter, or other measure placed around its inlet to prevent sediment from entering the pipe culvert. Silt fences and/or straw bales will be placed at pipe culvert outlets to collect sediment that does pass through the culvert. Riprap will be placed at pipe culvert outlets to dissipate energy.

Sediment traps will be used where appropriate and where space permits to trap runoff and allow the sediment to settle out.

Erosion control logs may be used in similar fashion or in conjunction with silt fences as a temporary measure. Erosion control logs may also be used in low flow waterways and ditches to channel runoff.

To provide the FHWA with an additional means of enforcing the erosion control plan and preventing degradation of water quality, the following statement will be included in the contract:

Monitor the turbidity of waters adjacent to the project. Take turbidity measurements using an HF-DRT 15 turbidimeter or equivalent upstream of the project and 150 meters downstream of the area of the highest turbidity. If the measurements show an increase of 10 Nephelometric Turbidity Units (NTU) or more, immediately suspend operations in the vicinity of the problem area and modify the erosion control plan to eliminate the cause of the high turbidity. Include turbidity readings, locations, and actions taken, if any, in inspections reports. Also provide documentation of meter calibration.

Specific erosion control measures required of the contractor include:

- Limit the combined grubbing and grading operations area to 3.0 hectares (7.4 acres) of exposed soil at one time.
- Unless a specific seeding season is identified in the contract, apply permanent vegetation establishment to the finished slopes and ditches within 30 days.
- Apply temporary vegetation establishment or other approved measures on disturbed areas that will remain exposed for over 30 days.
- Construct and maintain erosion controls on and around soil stockpiles to prevent soil loss.
- Following each day's grading operations, shape earthwork to minimize and control erosion from storm runoff.
- Inspect all erosion control facilities at least every 7 days, within 24 hours after more than 10 millimeters (one half inch) of rain in a 24-hour period, and as required by the contract's permits.
- Maintain temporary erosion control measures in working condition until the project is complete or the measures are no longer needed. Clean or replace erosion control structures when half full of sediment.

The *Standard Specifications For Construction of Roads and Bridges on Federal Highway Projects* (FHWA 1996) (*Standard Specifications*) requires that the contractor not place any materials into waters of the U.S. without a permit, and provides procedures to follow in the event of an unauthorized discharge. It addresses removal and disposition of accumulated sediment, proper storage of construction materials, and contractor work area cleanliness. Included in the contract specifications will be the following excerpt from the *Standard Specifications*:

Do not operate mechanized equipment or discharge or otherwise place any material within the wetted perimeter of any Water of the U.S. within the scope of the Clean Water Act. This includes wetlands, unless authorized by a permit issued by the U.S. Army Corps of Engineers, and if required, by any state agency having jurisdiction over the discharge of materials into Waters of the U.S. In the event of an unauthorized discharge:

- Immediately prevent further contamination
- Immediately notify the proper authorities
- Mitigate damages as required

Separate work areas, including material sources, by the use of a dike or other suitable barrier that prevents sediment, petroleum products, chemicals, or other liquid or solid material from entering the Waters of the U.S. Use care in constructing and removing the barriers to avoid any discharge of material into, or the siltation of, the water. Remove and properly dispose of the sediment and other material collected by the barrier.

For any build alternative, the construction contract will specify that, if a contractor's vehicle or person accidentally dumps pollutants that could pollute any water body along the proposed project, emergency action will be taken to prevent contamination of the water body. Reporting procedures for accidental spillage will be included in the contract. The FS, CDOW, the Town of Georgetown, the Argo water plant, and Colorado Department of Public Health and Environment (CDPHE) will be immediately informed of any such event. In-stream activity is limited to that necessary for placing structures and for wetland replacement measures. No in-stream fueling of any vehicle will be permitted. If the contractor locates an oil storage facility that exceeds a certain capacity (as specified in EPA regulations) and where the occurrence of spills could contaminate water bodies, the contractor will have to comply with EPA regulations in the preparation and implementation of a Spill Prevention Control and Countermeasure Plan.

The BMPs that will be employed for any construction project on Guanella Pass Road are found in four publications, and their contents are briefly summarized below.

The *Watershed Conservation Practices Handbook* (FS 1996) contains 17 standards in four categories: Hydrologic Function, Sediment Control, Soil Productivity, and Water Purity. Although some standards are mainly applicable to forest management needs, most will apply to roadway construction as well. Design considerations for meeting the standards are included.

An example standard is: "Design and construct all stream crossings and other in-stream structures to pass normal flows, withstand expected flood flows, and allow free movement of resident aquatic life." Design considerations are: "Stream crossings must be designed for specific flood flows and provide for passage of fish and other aquatic life. Crossings will be installed on straight and resilient stream reaches, as perpendicular to the flow as feasible. To keep stream beds and banks intact, the order of preference for stream crossings, as feasible, is: bridge, hardened ford, bottomless arch, culvert." (Note that the order of preference is for roads in general – a hardened ford is not appropriate for Guanella Pass Road.)

The *Guide to Water Quality Protection and Erosion Control* (Upper Clear Creek Watershed Association 1994) contains eight General Erosion and Sediment Control Principles: 1) time grading and construction to minimize soil exposure during periods of snowmelt and rainy periods, 2) retain and protect natural vegetation, 3) seed and mulch cleared areas, 4) infiltrate runoff from impervious and cleared surfaces, 5) minimize length and steepness of slopes, 6) keep runoff velocities low, 7) protect drainageways and outlets from increased flows, and 8) trap sediment on-site. Except for Principle 4, the principles are part of the FHWA's BMPs, and specific requirements are detailed in the FHWA *Standard Specifications*. Principle 4 is mainly intended for construction of buildings; infiltration along roadway cut and fill slopes can cause subsurface degeneration and slope instability.

BMPs are listed along with methods of implementation, materials needed, and maintenance tips. The BMPs listed are revegetation, mulching, slope netting, tree protection, berms and ditches, sediment barriers, driveway and parking area stabilization, infiltration systems, slope stabilization, drop inlets, snow removal, sanding procedures, and sediment basins.

Best Management Practices (FHWA 1998) contains many of the same BMPs noted above, but also includes extensive design details for inclusion in project plans. A section on stabilization measures covers temporary seeding, permanent seeding, sodding, topsoiling, mulching, erosion control blankets, and matting. The section on structural erosion control measures includes check dams, diversions, temporary slope drains, outlet protection, energy dissipaters, silt fences, straw bales, brush barriers, and inlet protection. A separate section covers sediment traps and basins.

4. Town of Georgetown – Construction Impact Measures

The Town of Georgetown has requested measures to minimize harm for construction impacts. Georgetown's concerns about construction impacts have been addressed by the FHWA as follows:

- Connection of Guanella Pass drainage to the town system at 5th Street. This connection necessitates curb and gutter installed to the town's specifications on Rose Street from 2nd to 5th Streets. The FHWA has committed to do this work in the past and plans to continue their discussions with Georgetown about how to accomplish this work.
- Agreement on a hauling route. The Board of Selectmen suggests consideration of using a 7th Street bridge constructed by the FHWA. Vehicles will use Argentine/Brownell to 7th and cross to Rose or Argentine depending on vehicle length. The bridge will be permanent. This route limits the number of bridges that will be used by construction vehicles to one, rather than requiring use of the existing bridges on Rose, 11th and 6th Streets which would have to be re-inspected and possibly reconstructed.
- The FHWA also believes that part of the parking lot between Argentine and Rose will need to be temporarily used to facilitate hauling vehicle turns onto Argentine and Rose from 7th Street.
- Argentine/Brownell Street will be used as a construction haul route. This area is part of Georgetown's proposed Gateway Improvement project. To mitigate construction damage to Georgetown's streets, the FHWA agrees to move Argentine/Brownell Street to the west one roadway width from 15th Street to just before 11th Street. The existing right of way width permits this change. The FHWA will taper Argentine/ Brownell back to match the existing roadway at the intersection with 11th Street. This roadway will be lowered for approximately one half of this length to better match the elevation of the existing parking areas adjacent to either side of the road. This work will not impact the trees on the west side of Argentine/Brownell near the intersection of 11th Street. The FHWA will use Georgetown's conceptual drawings for this work and create a design that matches those drawings as close as possible. The FHWA cannot perform any work outside this proposed roadway width since this would not be eligible for a haul road or construction damage mitigation.

I. HAZARDOUS MATERIALS

An onsite management model developed between CDOT and CDPHE will be used for managing any mine dump materials disturbed by any of the build alternatives. The main onsite management goal will be to prevent the mine dump material from entering surface water. Any mine dump materials excavated under any of the build alternatives will be reused as fill, and slopes exposed by the work will be covered with soil and revegetated, if practicable (i.e., slopes less than 2:1). The mine dump materials will not be used near seeps or culverts that could transport sediment or metals into local surface water or groundwater. A solid waste management plan, if needed, will be prepared in coordination with the CDPHE and the plan will describe the approach in more detail.

A storm water discharge permit will be obtained for the work, and the permit will include requirements for reducing pollutants in storm water discharges from the construction site. The permit will include a Storm Water Pollution Prevention Plan (SWPPP) that identifies BMPs. See previous discussions on BMPs. BMPs will be site management practices that minimize erosion and sediment transport (e.g., use of straw bales, silt fences, earth dikes, temporary or permanent sediment basins, flow diversions, etc.). The SWPPP will also include a description of the measures used to achieve final stabilization and measures to control pollutants in storm water discharges that occur after construction operations have been completed.

If the road improvements affect the electric transmission equipment within the corridor, coordination will be conducted with Xcel Energy and Intermountain Rural Electric Association concerning polychlorinated biphenyl (PCBs) that may have impacted any soils that will be disturbed by road construction.

J. SECTION 4(F) RESOURCES

The measures to minimize harm to Section 4(f) resources are as follows:

- Retaining walls, careful blasting techniques, rock-cut stain, and revegetation will be used to minimize visual impacts to Section 4(f) resources.
- Architectural treatments will be incorporated into the retaining wall design to reflect the backdrop and character of the historic district.
- During the pre-construction inspection, special care will be used to delineate clearing limits so that small construction adjustments can allow additional trees to be saved in the area of Guanella Pass Campground.