3.19 Mitigation Summary

One role of the PEIS is to provide general mitigation policies and strategies to guide the subsequent Tier 2 level of the NEPA process and implementation of the proposed action. These mitigation policies and strategies will undergo necessary refinement as a result of public review and comment on the Draft and Final PEIS, and will become specific mitigation commitments in the Tier 1 Record of Decision (ROD). The environmental impacts and resource mitigation for alternatives are described in sections 3.1 through 3.18. This section summarizes the efforts to avoid or minimize environmental and community impacts, describes Tier 1 mitigation policies, and provides a summary of resource mitigation.

At the Tier 2 level of the NEPA process, project-specific mitigation will be further shaped with design efforts to avoid and minimize impacts to the greatest extent possible.

The historic context of I-70 planning and construction provides a backdrop and perspective for establishing the role of mitigation policies for the future. At the inception of the Interstate Highway System in 1956, crossing the Continental Divide in Colorado was considered an almost insurmountable challenge. Establishing the alignment of I-70 through the Colorado Rocky Mountains involved nearly 40 years of planning and construction from the 1950s to the mid-1990s. Various alignments and tunnel locations over the Continental Divide and Vail Pass and through Glenwood Canyon were studied, and detailed siting occurred throughout the Corridor. The resulting planning, design, and mitigation for construction of the I-70 alignment has resulted in some of the most outstanding achievements in the entire Interstate Highway System. It is also recognized that establishing the existing I-70 alignment resulted from compromise, and there are lingering environmental and community effects that are still apparent today, as addressed in Chapters 3 and 4.

Through the PEIS process, several alternatives were studied to determine whether the project need could be met by utilizing alternate routes to I-70, or by creating new alignments for alternatives not adjacent to I-70. As described in section 2.1, it became apparent that alternate routes would not meet the project need, and new alignments would result in disruption of the environment and communities. As a result, these alternatives were screened from further consideration. The 21 alternatives that were retained for the PEIS would all be either adjacent to I-70 or would modify the existing I-70 template as described in section 2.2 to avoid or minimize further impacts in the Corridor.

3.19.1 Efforts to Avoid and Minimize Environmental and Community Impacts

Practical measures have been taken throughout the PEIS process to identify alternatives that would minimize environmental and community impacts. These efforts have centered on developing alternatives through the coordination of conceptual planning, design, and environmental studies, with the intent of minimizing alternative footprints. In addition, committees were formed to address issues and mitigation potential associated with sensitive resources. These measures will be key considerations in selection of the preferred alternative, design strategies for Tier 2, and implementation.

Key strategies in development of alternative alignments and design concepts to avoid and minimize environmental and community impacts are described below. Other efforts to avoid or minimize impacts that have been considered in the PEIS are provided in section 2.1.

- **Detailed planning to reduce alternative template width.** Throughout the Corridor, walls were used to reduce certain cut-and-fill areas. In areas where cut or fill slopes had the potential to extend beyond 30 feet, a retaining wall was added to the conceptual design to avoid the expansive slopes.
- **Use of existing I-70 area.** Efforts to minimize harm have been made in the conceptual design of alternatives. These efforts include using as much of the existing disturbed roadbed as possible and constructing walls to minimize slopes.
- **Snow storage areas.** Highway alternative templates include snow storage areas in select locations to capture snow and other roadway runoff, to reduce impacts on adjacent ecosystems.
- **Detailed planning in restrictive locations.** These areas include Dowd Canyon, Eisenhower-Johnson Memorial Tunnels (EJMT), Silver Plume, Georgetown, Fall River Road, Idaho Springs, Hidden Valley, and the US 6/I-70 interchange.
  - **Constraints near the EJMT.** To minimize the effect of alternatives on Loveland Ski Area operations, the third tunnel bore associated with each action alternative was located north of I-70 instead of south of I-70. More detailed studies will be required to confirm the feasibility of locating the third tunnel bore at this location.
  - **Alignments considered near Silver Plume.** In an attempt to avoid encroachment on Silver Plume, interchange alternatives were developed. Community development exists on both sides of I-70 through Silver Plume. Any expansion of transportation facilities through Silver Plume would alter the interchange and directly affect the community. In response to community comments, the westbound exit/entrance ramps would be relocated to the west edge of Silver Plume. During any Tier 2 NEPA analysis, a full range of design options for this interchange (including keeping the ramps in place) would be evaluated. Tunnel alternatives that would potentially avoid Silver Plume were studied and found to be infeasible. In addition, a new tunnel would have significant impact on the town.
- **Rockfall hazard near Georgetown.** All alternatives were expanded to the south of I-70 near Georgetown Hill to avoid the constraints of this rockfall hazard area. A tunnel was considered in this area to further avoid impacts on Georgetown and Silver Plume; however, a tunnel is not considered feasible due to geological constraints from historic mining.
- **Minimizing footprint in Idaho Springs.** Several measures were taken to minimize the footprint of alternatives near Idaho Springs, due to the proximity of I-70 to community development, the football field, the Charlie Tayler Waterwheel Park, Clear Creek, and steep slopes. All alternatives through Idaho Springs may be structured or overlapped to reduce template width in this area. Elevated sections could be located on the eastbound or south side of I-70 to minimize impacts on the town. The Rail with IMC and AGS alternatives were located on the south side of Idaho Springs to avoid community impacts. As a result, alternatives would be nearer to Clear Creek and wetlands due to the restricted topography of Clear Creek Canyon. A full range of design options will be considered in Idaho Springs during Tier 2 analysis.
- **Visual effects at the Genesee Bridge.** This bridge is locally known as the Picture Bridge due to the framed views of the Continental Divide and Denver afforded from the highway at this vantage point. This panoramic viewshed is the last glimpse of the Continental Divide from westbound I-70 until west of Silver Plume. In order to avoid disruption of the panoramic views, Transit alternatives in this location were designed to traverse under the bridge.

Supporting Documentation

- Appendix F, Biological Resources and Wetlands Documentation
- Appendix G, Water Resources
- Appendix I, Regulated Materials and Historic Mining
- Appendix K, Overview of Water Availability and Growth, and Forest Service Land Management
- Appendix N, Historic Property Survey, Native American Consultation, and Paleontological Resources

- **Rail with IMC and AGS alignments.** Alignment locations for the Rail with IMC and AGS alternatives vary (north or south side of I-70) based on proximity of sensitive features. The ability to alternate sides of I-70 allows for avoidance of geologic constraints, streams, wetlands, communities, and other sensitive features.

- **Avoiding impacts on wetlands.** Impacts on wetlands, other waters of the US, riparian areas, and aquatic habitats would be avoided where possible by means of alignment shifts away from the resource, in accordance with 404 (b)(1) guidelines. Impacts on fens will be avoided entirely.

- **Protecting Historic Properties.** Alignments and design concepts have been developed to avoid or minimize effects on historic properties. Alternatives within the Georgetown-Silver Plume National Historic Landmark (NHL) District; the Lawson, Downieville, Dumont historic area; and Idaho Springs (includes Historic Commercial District and potential historic area) have been located so that footprints are minimized. Other alternatives considered (for example, a Georgetown Hill tunnel) were found to be infeasible and were screened from further consideration. A Programmatic Agreement (PA) will be developed with input from consulting parties for compliance with Section 106 of the National Historic Preservation Act to protect historic properties.

3.19.2 Mitigation Policies

The following mitigation policies will be implemented by CDOT and FHWA during Tier 2 studies:

1. Employ design strategies to further minimize impacts on communities and the environment, including the following:

   a. 1A – Utilize the general alignment and design elements selected during Tier 1 unless other reasonable and feasible alternatives with similar or fewer impacts surface.

   b. 1B – Use standard design parameters. In isolated instances, consider variances from standard designs in order to further minimize impacts, as long as the resulting alternatives are reasonable and feasible.

   c. 1C – Utilize the principles of "Context Sensitive Design," including significant involvement of affected communities in determining the ultimate footprint, aesthetic elements, and other features germane to the alternative.

   d. 1D – Determine noise mitigation strategies with affected communities, residents, and businesses.

   e. 1E – Encourage interested parties to develop and evaluate a list of reasonable design refinements to the selected alternative that would represent an affected community's ideal of aesthetically pleasing infrastructure.

2. Apply the conditions to be set forth in the Programmatic Agreement between the consulting parties involving Section 106 of the National Historic Preservation Act.

3. Fulfill responsibilities set forth in the ALIVE (A Landscape level Inventory of Valued Ecosystem components) agreement and the Biological Assessment to be developed in conjunction with USFWS. The ALIVE program provides opportunities to address issues related to improving wildlife movement and reducing habitat fragmentation in the Corridor. Mitigation measures will be developed to offset impacts on species identified in the Biological Report for the WRNF and ARNF.

4. Comply with the 404(b)(1) guidelines of the Clean Water Act. Engage stakeholders to continue the work of the Stream and Wetland Ecological Enhancement Program (SWEEP) committee in an effort to integrate water resource needs (such as water quality, fisheries, wetlands, and riparian areas) with design elements for construction activities and long-term maintenance and operations of the transportation system.

5. Integrate winter storm management and maintenance procedures into the template of the infrastructure. Highway alternative templates throughout Clear Creek County would include snow storage areas in select locations to capture snow and other roadway runoff to reduce impacts on adjacent ecosystems.

6. Implement the Sedimentation Control Action Plans (SCAPs) developed specifically for Straight Creek and Black Gore Creek to identify methods to control the existing transport of winter sanding materials. Consider other Corridor areas such as the upper reaches of Clear Creek for additional SCAP activity.

7. Develop information systems (such as advertising campaigns to support local businesses, signage with hours of operation, and detour plans) to inform affected communities, I-70 travelers, businesses, and homeowners about construction activities and schedules.

Other examples of design strategies are outlined in section 3.19.3 and Table 3.19-1.

3.19.3 Summary of Resource Mitigation

The environmental issues and mitigation described in this section are programmatic in nature. All alternatives could result in varying degrees of impact on the resources under study. Mitigation strategies are comprehensive in nature and crafted for this Corridor to address the types of resource impacts reported in sections 3.1 through 3.18.

The mitigation policies and strategies presented in this section will be shaped to the preferred alternative as a result of public review of and comment on this Draft PEIS, then presented in the Final PEIS. These policies and strategies will undergo any necessary refinement resulting from public review and comment on the Final PEIS, and will become specific mitigation commitments in the Tier 1 ROD.

At the Tier 2 level of the NEPA process, project-specific mitigation will be further shaped with design efforts to further avoid and minimize impacts to the greatest extent possible.

Table 3.19-1, Summary of Resource Mitigation, recaps the mitigation contained in sections 3.1 through 3.18.

Table 3.19-1. Summary of Resource Mitigation

Resource Topic	Issues	Mitigation
3.1, Climate and Air Quality	• Motor vehicle emissions • Motor vehicle direct particulate matter emissions, including re-entrained dust from highway and street sanding and unpaved roads • Visibility in and near Class I and II Wilderness Areas	Because project alternatives are not anticipated to cause or result in violations of any NAAQS, mitigation measures for air quality will center on controlling fugitive dust during construction. Mitigation measures for air quality will be developed and refined at the Tier 2 level of study in the context of a specific project. However, mitigation measures that normally apply to construction projects to reduce impacts are addressed in the text below. Construction impacts will primarily be mitigated through implementation of appropriate best management practices (BMPs). Conceptual techniques for mitigation of impacts could include the following. • Control fugitive dust through a fugitive dust control plan, including wetting of disturbed areas • Use the cleanest fuels available at the time in construction equipment and vehicles to reduce exhaust emissions • Keep construction equipment well maintained to ensure that exhaust systems are in good working order • To minimize wind blown dust from blasting, particularly near community areas, control blasting and avoid blasting on days with high winds • Minimize dust from construction in tailing areas Additionally, highway maintenance strategies will continue to be explored to minimize the amount of sand used for winter maintenance and to remove the sand from the roadway to minimize re-entrained dust.
3.2, Biological Resources: Vegetation	• Loss of vegetative cover • Loss of sensitive and rare plant communities • Effects of winter maintenance • Introduction and spread of noxious weeds	Mitigation measures for biological resources center on reducing habitat losses as soon as possible in areas that can be reclaimed, reducing existing barriers, and controlling runoff from road surfaces. These mitigation measures will be developed and refined at the Tier 2 level of study in the context of a specific project. However, mitigation measures that normally apply to construction projects to reduce impacts are addressed in the text below. Vegetation impacts would be minimized to the extent possible by constructing new facilities on previously disturbed areas of the I-70 right-of-way whenever possible. Other measures to reduce the magnitude of construction impacts would focus on maintaining hydrology on both sides of the Corridor, increasing containment of traction sand and deicer, and re-establishing vegetation in areas used for construction as soon as feasible. Noxious weeds occur in all of the counties and drainage basins traversed by the Corridor. Clearing and earthmoving operations must be managed in a way that minimizes the potential for weeds to infest new areas or spread in the construction disturbance area. Best management practices (BMPs) that are specified by CDOT must be applied to all construction sites to manage open soil surfaces and topsoil that is stockpiled for reuse, and Noxious Weed Management Plans will be required for all projects. Specific mitigation measures for construction work might include: • Salvaging topsoil for use in reclamation • Using BMPs and erosion control measures to reduce soil losses, soil inundation, and sedimentation in areas adjacent to the construction area • Providing sufficient cross-slope drainage structures during new construction to allow natural hydrologic conditions to be maintained on both sides of the right-of-way • Revegetating construction areas as soon as possible, using salvaged topsoil and native species adapted to area conditions • Monitoring and controlling weed species The best technology available would be used in selecting the materials applied for winter maintenance and for material containment. Specific issues and impacts associated with operation of the transportation facility will be addressed in more detail in Tier 2 studies. Specific mitigation measures developed in Tier 2 will focus on limiting construction disturbance zones to the minimum area necessary, protecting sensitive resources along the Corridor.
3.2, Biological Resources: Wildlife	• Barriers to wildlife movement and mortality from animal-vehicle collisions • Direct habitat loss and fragmentation • Intensified impacts on adjacent habitats (road effect zone) • Indirect effects of increased population growth and land use change on habitats	**Barrier Effect:** In developing the linkage interference zones, the ALIVE committee addressed measures that would facilitate decreasing the barrier effect of I-70 and also decrease the number of animal-vehicle collisions. These measures would include providing more crossing opportunities with bridging or overpasses to the extent practical, erecting more wildlife fencing, or repairing existing fencing where appropriate. Section 3.2 provides specific mitigation recommendations developed by the ALIVE committee for each linkage interference zone in the Corridor. The strategies for mitigation of linkage interference zones developed for this Tier 1 PEIS are not specific to alternatives. Additional mitigation can be specified at the design level for specific alternatives during the Tier 2 phase. **Habitat Loss:** Construction of project alternatives would use the existing right-of-way to the extent possible by engineering design. This would include using as much median and areas already disturbed as possible to reduce impacts on adjacent habitats. CDOT will work with USFS and local entities to identify other previously disturbed areas where habitat restoration would be beneficial. Removal of trees and shrubs for implementation of project alternatives would be accomplished during the non-nesting periods per the Migratory Bird Treaty Act. **Road Effect Zone:** Impacts on adjacent habitats from project alternatives will be reduced to the extent possible by project design to control runoff of contaminants and winter maintenance materials, and noxious weed species in the right-of-way.

3.19 Mitigation Summary

Resource Topic	Issues	Mitigation
3.3, TES and MIS Species	**Effects on:** • Species that are federally listed as threatened or endangered and species that are proposed or candidates for listing as such in accordance with the Endangered Species Act • Species listed by the Colorado Division of Wildlife as threatened, endangered, or Species of Concern • Species included on sensitive species lists developed by USFS Region 2 or BLM • Species identified by the Colorado Natural Heritage Program as rare or endangered • Selected MIS species for the Arapaho and Roosevelt National Forests and White River National Forest	Habitat loss for TES species would be minimized by constructing any new facilities (such as lanes or structures) in the right-of-way and avoiding rare habitats where possible. Impacts on biological resources would be minimized where possible by means of alignment shifts and structural adjustments away from sensitive habitats, using elevated segments in critical areas such as Idaho Springs, and through the use of walls to minimize cut-and-fill slopes. Adding wildlife crossing structures and improving existing structures as recommended by the ALIVE committee would reduce the barrier effect of I-70 through the Corridor in areas that are especially important linkages and identified as linkage interference zones. Wildlife fencing would need to be erected, extended, or repaired in these areas as well to reduce animal-vehicle collisions. Road effect zone impacts related to sedimentation and contaminated runoff will be reduced by construction of sedimentation ponds to capture runoff and by use of other CDOT BMPs to reduce erosion and road runoff. When projects reach the Tier 2 level, weed management plans will be included (per CDOT regulations) to curtail the spread of noxious weeds into habitats. Intensive surveys of TES species habitats will be required as part of specific project development, and this information will be incorporated in project design to avoid affecting such species to the extent possible. Analysis of impacts on TES species has been coordinated with USFWS at this Tier 1 level of study, and will continue in Tier 2 studies. A Biological Assessment according to ESA requirements and USFWS guidelines will document such actions, and a Biological Evaluation per USFS guidelines for TES species and management indicator species has been developed for this project. Protection measures for TES and MIS species will be addressed during project design and during implementation in Tier 2 for this project.
3.4, Water Resources	**Direct Impacts** • Highway runoff and winter roadway maintenance activities' impact on water quality • Disturbance of historic mine waste materials due to highway construction activities that might release contaminants (such as heavy metals) into streams • Potential additional impacts on water quality impaired streams and streams with classifications and standards requiring special consideration • Effects on stream stability, hydrologic function, system health, and riparian system **Indirect Impacts** • Spills and hazardous materials transport possibly releasing contaminants into nearby waterways • Development and urbanization possibly resulting in impacts on water quality and streams • Channelization and other changes to stream morphology	All action alternatives would require effective drainage of the roadway surface to maintain the integrity of the roadbed and the safety of the traveling public. All water that is captured within the I-70 transportation template will be discharged rapidly through an effective drainage system. Local watershed initiatives will be incorporated into Tier 2 project alternative mitigation strategies, and mitigation will consider the goals of the local watershed planning entity. BMPs implemented along the Corridor, for example, could be designed to address individual watershed entity concerns. In some cases, a monitoring program could be implemented to provide timely information needed for ongoing management of the watershed. Any required control regulations, TMDLs, National Pollutant Discharge Elimination System (NPDES) permits, state standards, or other mandatory control measures, as well as voluntary measures, could then be included in the overall program. CDOT will coordinate with local watershed entities during Tier 2 studies and during design/construction stages to achieve these goals and ensure consistency in the process. In addition, CDOT will work closely with regulatory and resource agencies and the general public throughout this process to ensure adherence to water quality goals at the local, state, and federal levels. In Tier 2 studies, steps will be taken to safeguard intakes for public water supplies in the immediate vicinity of I-70, including alluvial wells associated with Corridor streams, from sediment, deicers, and other constituents contained in highway runoff. Implementation of a project alternative will be done in conformity with Section 107.25 and Section 208 of the CDOT *Standard Specifications for Road and Bridge Construction*. These specifications also include measures that protect water quality and streams. Tier 2 studies will evaluate and identify permanent mitigation measures for specific issues, including structural controls (beyond the Black Gore Creek and Straight Creek SCAPs). **Winter Maintenance and Stormwater Runoff** Increased impervious surface would impact winter maintenance activities and stormwater runoff. BMPs, highway maintenance strategies, and drainage/sediment control structures will be implemented as appropriate to minimize impacts from winter maintenance and increased stormwater. Methods of capturing and reducing the amount of sand/salt applied to the Corridor include structural sediment control and retrieval, automated deicing systems, solar snow storage zones, and porous pavement (CDOT 2002a, 2002b). Areas requiring the most plowing and use of traction sand are the higher elevation zones of the Corridor above 9,000 feet that receive more snowfall. Black Gore Creek and Straight Creek are areas where application of traction sand has impaired stream water quality. The SCAPs developed for the Black Gore Creek and Straight Creek I-70 corridors rely extensively on detention basins for collection of sediment (CDOT 2002). These sediment control devices or structural BMPs are effective in reducing suspended solids and total phosphorus in highway discharges. Many of the sediment control measures specified in the SCAPs have already been successful in reducing sediment loads from I-70. Reductions have been measured in Straight Creek and Black Gore Creek. When the SCAPs are fully implemented, sediment load reductions of up to 80 percent are possible (CDOT 2002). However, load reductions would be highly variable due to factors such as runoff distribution, drainage control, sand applications, maintenance procedures, and BMP design. Full implementation of SCAPs could occur in a more timely fashion with the development of a selected alternative.

Resource Topic	Issues	Mitigation
3.4, Water Resources (continued)	See previous page.	**Construction and Stream Disturbance** Construction impacts would primarily be mitigated through implementation of appropriate BMPs for erosion and sediment control according the CDOT *Erosion Control and Storm Water Quality Guide* (CDOT 2002). According to the guide, a stormwater management plan (SWMP) must be developed before any major construction project that specifies water quality protection BMPs. Both structural and nonstructural control measures are described in the document to reduce water quality impacts from areas disturbed by construction. The SWMP may include monitoring of erosion and water quality during and after construction. Soil stabilization and revegetation measures are commonly employed to reduce long-term impacts from construction disturbance. Drinking water sources and special considerations such as instream flow requirements for fisheries will be evaluated in light of I-70 construction requirements during Tier 2. The portion of I-70 from C-470 to the Clear Creek County border falls under the designated CDPHE NPDES Phase II regulations (as designated and administered by CDPHE-WQCD). This area includes the Mount Vernon Creek, Soda Creek, and Beaver Brook watersheds. CDOT has an NPDES permit (Permit No. COS-000005) authorizing new or existing discharges composed entirely of stormwater from CDOT's municipal separate storm sewer system (MS4). The Storm Water Management Program included in the permit consists of eight programs, including maintenance of structural controls, industrial facilities, construction sites, and facility runoff control. The permit requires BMPs during construction (including site dewatering) and post-construction permanent BMPs to be considered early in the project development process. This commitment will address right-of-way and design of permanent stormwater quality controls in detail to avoid the necessity of retrofitting the stormwater quality control structures in the future. Classifications and uses of the state waters affected by the ramps and roadways would drive the types of permanent water quality control structures necessary to protect these uses. In addition, CDOT's New Development/Redevelopment MS4 Stormwater Management Program calls for increased protection of waters identified as sensitive. An individual NPDES permit could be required for discharge to streams with TMDLs or other special circumstances. Implementation of a project alternative would be done in conformity with Section 107.25 and Section 208 of the CDOT *Standard Specifications for Road and Bridge Construction* and Senate Bill 40 (SB 40) certification. These specifications would also include measures that protect water quality and streams. Tier 2 studies will evaluate and identify permanent mitigation measures for specific issues, including structural controls beyond the Black Gore Creek and Straight Creek SCAPs. Stream restoration measures might include creation of drop structures and/or bioengineering techniques. Temporary and permanent impacts on stream flow and channels require CWA 404 permitting by the Corps of Engineers (see section 3.6). Impacts on areas that have previously been disturbed by existing I-70 would provide opportunities for stream restoration measures that might improve stream environments and aquatic habitat. Stream restoration measures might include creation of drop structures (used to create riffle and pool areas) and revegetation of barren areas, or possible realignment in Idaho Springs as part of context sensitive design preferences. Impacts from disposal of tunnel waste materials and tunnel construction staging areas would be minimized by rigorous application of SWMPs and BMPs (including site dewatering) that keep construction-originated materials from entering waterways. Tunnel construction would generate large quantities of process/wastewater. CDOT would dispose of process/wastewater according to CDPHE-WQCD requirements. Disposal methods generally include appropriate treatment for disposal to Corridor streams, temporary construction pond disposal, or transport to a treatment facility. The original construction of the EJMT included capture of wastewater in detention basins to allow sediment to settle out. Water was then discharged to Clear Creek and Straight Creek. Additional technical research (Tier 2) will be required to evaluate the possibility of the Floyd Hill tunnel (part of the Six-Lane Highway 65 mph alternative) to affect area groundwater flows that are important today for individual water well owners. Permitting and coordination under CWA Regulation 404 and under water rights and appropriations considerations with the DWR might be necessary. If resident water wells were affected due to the tunnel, mitigation requirements would most likely consist of drilling deeper wells for the affected area residents. Such mitigation would be considered generally feasible. While unlikely based on Tier 1 information, if deeper wells are found not to be feasible, mitigation with an alternative water supply (that is, not local groundwater) might be unrealistic. Floodplain analysis in compliance with 23 CFR 650 will be conducted during Tier 2 studies. **Transportation Operations** *Hydraulic Disruption of Tributary Streams* The initial construction of I-70 through Corridor valleys resulted in the interception of numerous tributary streams. Many of the tributaries are ephemeral, flowing only after precipitation events. In some areas along the Corridor, these tributaries drain unconsolidated geologic materials that are subject to severe erosion and sediment or debris transport. Typical measures taken to convey tributary flows included installation of cross-drain culverts beneath I-70. Larger streams require box culverts or bridges. Under conditions of high sediment or debris transport from these tributaries, I-70 can serve as a dam by preventing part or all of the sediment and debris from depositing on the valley floor or in receiving streams and rivers. In these instances, I-70 may reduce the sediment loading to receiving waters. However, significant maintenance of the highway shoulders and culvert drains is required to maintain hydraulic conveyance and to prevent encroachment of debris on the highway. Sediment dikes have been installed in several high debris flow areas along I-70 in the lower Eagle River Valley. In the Clear Creek watershed where these tributaries drain mine waste, I-70 can serve as an effective sediment dam that reduces metal loading. These tributaries are prevalent along I-70 between Idaho Springs and Silver Plume. If additional sediment control structures were installed and maintained in these areas, net cumulative improvements to water quality through reduced sediment metal loading could be realized. Effective hydraulic design and maintenance measures would minimize impacts from tributary hydraulic disruption. For some alternatives, it may be possible to mitigate existing hydraulic problems, resulting in overall improvements to the transportation system and decreased environmental impacts. *Tunnel Maintenance and Operation* Tunnel discharges are typically regulated as point source discharges under the Clean Water Act, requiring an NPDES permit. Further study (Tier 2) will be required to identify tunnels that might require water discharge systems, water treatment systems, and/or NPDES permits. Water rights issues must also be considered in the context of Colorado water law for new groundwater discharges.

3.19 Mitigation Summary

Resource Topic	Issues	Mitigation
3.5, Fisheries	• Effect on Gold Medal fisheries and "high-value" fisheries as identified by CDOW • Effect on fish and benthic invertebrate habitat, including impact on stream structure, seasonal and spawning habitat, and organic material supply • Impact of water quality and quantity on riparian areas, aquatic habitat, and fisheries • Impacts of sedimentation on aquatic organisms' reproductive success, biodiversity, and biomass • Effects of altered water temperature from construction and operation of roadway modifications on sensitive coldwater species	See Water Resources above for other applicable mitigation. Mitigation techniques for restoration/replacement of fish habitat generally include placement of boulder cloisters, rock vortex structures, root wads, and protection/transplanting/replacement of vegetation. Other requirements for mitigation plans would include photographic documentation and surveys of "fish holes" so that they can be replaced or cleaned to previous conditions. Additional evaluation of fisheries, including localized temperature concerns, will be performed during Tier 2 studies. The design of project alternative structures would include measures that ensure continued aquatic habitat connectivity and do not cause any obstruction to fish movement. Mitigation and avoidance of impacts on streams (including impacts on water quality and riparian habitat) are further discussed in section 3.4, Water Resources; section 3.6, Wetlands, Other Waters of the US, and Riparian Areas; and Chapter 4, Cumulative Impacts Analysis. Specific mitigation plans for the protection/restoration of fisheries are beyond the scope of the PEIS and will be addressed during Tier 2 studies.
3.6, Wetlands, Other Waters of the US, and Riparian Areas	• Loss of wetlands, springs/fens, other waters of the US and riparian areas • Reduced function of wetlands, springs/fens, other waters of the US, and riparian areas • Changes in surface and subsurface hydrology and water quality (for example, inflows, sedimentation, winter maintenance) that result in loss of either area or function	While mitigation activities are expected to minimize impacts, some impacts on Corridor wetlands and other water resources are still likely. Wetlands and other water resources would have the potential to be affected during construction by erosion-sedimentation material and by runoff from the roadbed during operations. Impacts on wetlands and other water resources will be addressed more specifically for each project that is evaluated during Tier 2. At the Tier 2 level of analysis, detailed delineations will be conducted to define and map wetlands as a basis from which to assess impacts, compare alternatives (as part of meeting CWA Section 404(b)(1) guidelines), and establish a framework for 404 permits. CDOT will examine the feasibility of requiring specific mitigation measures at the Tier 2 level of analysis, including the following: • Ensuring construction contracts include a clause requiring the contractor to not spoil waste/excavated materials into a water of the US or other nonjurisdictional aquatic sites • Ensuring construction contracts include a clause stating that all aggregates must be acquired from onsite excavation or pre-existing aggregate mines • Identifying areas of the Corridor where there would be opportunities to restore wetlands and/or enhance wetland functional value along the Corridor and also identifying areas where wetlands could be expanded (such as SWEEP coordination) • Redesigning structures that would impede hydrologic continuity • Controlling the amount of winter traction sand, liquid deicer, and other roadway runoff that affect wetlands and stream systems Efforts to minimize impact have been made in the design of alternatives with such considerations as using as much of the existing highway footprint as possible and erecting walls to minimize slopes. Impacts on wetlands, springs/fens, other waters of the US, and riparian areas would be avoided where possible through alignment shifts away from the resource. Further mitigation strategies will be implemented in the Tier 2 level of study. CDOT is committed to avoid fens through project planning at the Tier 2 level of study. Permanent impacts from expanding the existing transportation template to accommodate transit, additional lanes, or both would be avoided or minimized to the extent possible during engineering design of specific projects. Areas that could not be avoided would be mitigated by restoring and enhancing wetlands or, if these opportunities do not exist, establishing new wetlands. New wetlands sites are being identified for wetland mitigation, and to date one site has been secured in Clear Creek County just west of US 40. CDOT owns a 70-acre parcel that has been set aside for wetland mitigation. BMPs would be used during construction operations, the specifics of which will be developed for each project in the Tier 2 level of study. Possible BMPs include: • Erecting exclusion fencing to protect wetlands from intrusions of equipment • Erecting silt fencing and other erosion control materials to protect wetlands and stream systems from erosion run-in • Locating equipment servicing and staging areas at a suitable distance from wetland and drainage systems to protect these areas from contaminants, and placing a berm at the downgradient position between such operations and wetlands-drainage systems • Revegetating areas used for construction support as soon as possible to curtail erosion and rapid runoff that may affect wetlands and aquatic habitats • Developing and implementing stormwater management plans for each phase of the project • Developing noxious weed management plans for each phase of the project • Following CDOT guidelines for concrete washout areas, locating them well away from wetlands, springs/fens, other waters of the US, and riparian areas, and controlling runoff from these areas • Maintaining existing vegetated buffers or establishing buffers to protect wetlands and streams Means to reduce the impacts on area streams of winter sanding operations are currently being evaluated. SCAPs focus on Black Gore Creek (Upper Eagle River sub-basin) and Straight Creek (Upper Blue River sub-basin) because these systems have already been adversely affected by traction sand. This action will result in new practices to provide a beneficial effect on many of the stream systems and associated wetlands along I-70. Other measures to address winter maintenance are currently being evaluated and include sand retrieval, automated deicing systems, and solar snow storage zones.

Resource Topic	Issues	Mitigation
3.7, Geologic Hazards	• Potential to exacerbate existing geologic hazards and adversely affect safety, service, and mobility due to rockfalls, debris flows, mudflows, avalanches, landslides, and other hazards • Potential to intersect areas of geologic instability (adverse jointing fracture patterns and/or bedding) and create geologic hazards • Engineering constraints due to limitations on stability of slope angles • Soil erosion, erosion control, and reclamation potential	**Mitigation from Previous Projects** I-70 has undergone numerous modifications since it was first built. Many early projects did little or nothing to mitigate geologic hazards and soil erosion in these areas. In fact, the design of many early projects exposed some natural hazards. Design features in recent projects such as Glenwood Canyon, Vail Pass, and Berthoud Pass have mitigated geologic hazards and soil loss. Excavation and landscaping techniques were used to minimize soil loss and reverse existing erosion problems. In addition, roadway geometry on these projects was designed to minimize slope excavation and follow much of the natural topography. On the Glenwood Canyon project, excavations used a new technique called rock sculpting, which involves blasting rock by using the existing rock structure to control overbreak and blast damage. This technique creates a more natural-looking cut and has been used on other projects throughout the western US. Some I-70 projects have remediated erosion problems and geologic hazards that resulted from the original design of I-70. The Straight Creek erosion control projects along the west approach to the Continental Divide mitigated soil loss originating from the oversteepened cut slopes. Rockfall mitigation projects and scaling programs have been implemented at several locations, including Dowd Canyon and the Georgetown Incline. At the latter, mitigation measures specifically address rockfall from the cut slope and area of disturbance from the original highway construction. After considering numerous mitigation designs at the Georgetown Incline, CDOT has determined that fencing is the most practicable technique to protect the traveling public. The original construction of EJMT produced approximately 1 million cubic yards of excavated material that was disposed of at various locations surrounding the site. The disposal techniques used at that time provide examples of potential disposal options for the waste rock generated by tunnels constructed for I-70 alternatives. A large portion of material was placed as fill in the I-70 embankments at both approaches to the tunnels. Some material was also placed in two disposal sites in the Arapaho and Roosevelt National Forests along the north side of the highway approximately 1 to 2 miles east of the tunnel. Suitable remaining material was crushed and used as aggregate in the concrete placed in the lining and other structural portions of the tunnels. **Mitigation of Alternatives** Excavations in rock and soil would cause both temporary impacts from construction activities and long-term impacts associated with achieving and maintaining slope stability. Slopes constructed in rock must be safe from rockfall and large-scale slope instability during construction and operation. Design of these slopes must consider the variable and complex geologic conditions encountered along the Corridor through the affected domains. Transit platforms constructed in the Gore Mountain Range domain and along Straight Creek would require considerable stabilization of landslides to ensure a stable operating platform. Possible mitigation measures include retaining structures, buttresses, slope geometry modifications, and drainage enhancements. Potential techniques for mitigation of geologic hazards affecting I-70 alternatives have been used on past I-70 projects. Design features of relatively recent projects such as Glenwood Canyon, Vail Pass, and Berthoud Pass have mitigated geologic hazards and soil loss. Excavation and landscaping techniques were used to minimize soil loss and reverse existing erosion problems. In addition, roadway geometry on these projects was designed to minimize slope excavation and follow much of the natural topography. On the Glenwood Canyon project, excavations used a new technique called rock sculpting**,** which involves blasting rock by using the existing rock structure to control overbreak and blast damage. Some I-70 projects have remediated erosion problems and geologic hazards that resulted from the original design of I-70. The Straight Creek erosion control projects along the west approach to the Continental Divide mitigated soil loss originating from the oversteepened cut slopes. Rockfall mitigation projects and scaling programs have been implemented at several locations, including Dowd Canyon and the Georgetown Incline. At the latter, mitigation measures specifically address rockfall from the cut slope and area of disturbance from the original highway construction. After consideration of numerous mitigation designs at the Georgetown Incline, CDOT has determined that fencing would be the most practicable technique for protection of the traveling public. **Tunnel Waste** Construction of tunnels would create large quantities of waste rock. CDOT would use waste materials onsite wherever possible. Onsite uses of rock and clayey materials would minimize truck traffic and disposal fees, in addition to avoiding environmental effects of transportation and disposal. Onsite uses might include having onsite crushers and concrete or asphalt plants for the creation of aggregate and riprap. These materials might be used for drainage channels, avalanche chutes, rockslide stabilization, berms, and road base. If onsite use is not possible or feasible, numerous disposal options have been identified below. Mitigation and handling of tunnel construction wastewater/process water is discussed in section 3.4, Water Resources. Several mining operations located in Eagle, Summit, Clear Creek, and Jefferson counties were contacted about the potential for storage, resale, or disposal of this waste rock. These operations likely would be active (although possibly in final reclamation phase) 20 to 30 years in the future. *Waste Rock Management for Tunnel Construction* (Huyck 2002) contains more detailed information, including potential temporary storage, resale, or disposal sites. (Note that costs listed here reflect current charges, not net present value.) Private operations were considered for waste rock management. Although a borrow pit located on USFS land was considered, the site was dismissed due to possible environmental effects. Three types of waste rock have been considered: hard rock that could be processed and sold, hard rock that would be too large to reprocess, and clayey or crumbly material that could not be sold. Section 3.7, Geologic Hazards, lists the locations where material originates, the maximum amount of waste that would be generated, and the rock type that would be generated. If tunnel construction waste material is excavated on USFS lands and transported off USFS lands for either disposal or to private vendors who in turn sell the material, then CDOT would be required to purchase the mineral material through a common minerals permit with the USFS. If the excavated mineral material were used as part of a project alternative or another CDOT project located on USFS lands, no payment would be required to use the mineral material. If the excavated mineral material were used on another public project (for example, fill for a school foundation), CDOT could apply for a free-use permit and would not be charged for using the material on the public project (see existing Memorandum of Understanding (MOU) between FHWA, CDOT, BLM, and the USFS relative to management of the state transportation system through public lands for additional information/clarification). The MOU contains a price list for mineral materials on USFS lands, and this will be considered to support site-specific cost estimates and waste rock management strategies in Tier 2 studies.

3.19 Mitigation Summary

Resource Topic	Issues	Mitigation
3.8, Regulated Material and Mining Waste	• Properties contaminated by hazardous waste or petroleum products • Containing hazardous material • Highway accidents potentially releasing environmental contaminants into adjacent land and streams • Potential for contamination from mine tailings and wastes from historic mines in the Corridor	As a general rule, CDOT would take the following steps to minimize and avoid potential environmental impacts resulting from the disturbance of regulated materials and historic mine wastes: • Minimize property acquisition and disturbance of mine wastes, tailings, drainage tunnels, and areas in active/inactive leaking underground storage tank (LUST) sites • Minimize impacts on the Clear Creek channel and floodplain both during and after disturbance of mine waste, tailings, and drainage tunnels • Manage mine waste and tailings materials onsite as far as possible to minimize potential problems resulting from offsite disposal • Minimize wind-blown dust from mine tailings on construction sites by wetting or other dust control measures • Manage mine waste and tailings materials under CDPHE and EPA guidance and authority • Manage contaminated soil and groundwater under applicable CDPHE, EPA, Colorado OPS, and CDOT regulations and guidance • Follow CDOT procedures and other applicable guidance for storage and handling of regulated materials and historic mine waste during construction activities • Work cooperatively with various local, state, and federal agencies and local watershed groups to help avoid further impacts on and possibly improve Clear Creek water quality, including management of mine piles and tunnels within the I-70 right-of-way **LUST Sites** Disturbance of identified LUST sites would require coordination with Colorado OPS to ensure proper handling and disposal of contaminated materials (also see CDOT requirements and BMPs below). Construction activities associated with the alternatives may also uncover petroleum contamination from identified LUST sites or from LUST site contamination that was not indicated by PEIS research activities (or during subsequent research). Should contamination be discovered, construction activities would be temporarily halted until characterization/storage/disposal/cleanup requirements could be discussed with the Colorado OPS or a professional familiar with OPS procedures and requirements. Non-petroleum contaminants might also be encountered and would be handled under CDPHE Solid Waste or RCRA Hazardous Materials regulations and requirements, and EPA toxic substances requirements if applicable. **UST Sites** USTs from existing and historic service stations might also be encountered. USTs must be removed according to Colorado OPS requirements during excavation/construction activities for any of the alternatives where they would be affected by the project footprint. Tank removal would generally include sampling and analysis of underlying soil and soil removal (if necessary) to meet OPS designated standards. **Dewatering** Excavation and grading activities for all of the alternatives, especially those that would include tunnel construction, might encounter groundwater and require dewatering activities. Tunnel construction practices would include consolidation grouting to minimize inflow into the tunnel. However, dewatering activities would be required on the tunnel and at the waste disposal (spoil) areas. Should dewatering be required, permit acquisition (from CDPHE) for discharge of groundwater into nearby surface water may require water analyses, removal of specific contaminants to CDPHE- and EPA-approved levels, and lowering of total suspended solids (TSS) to acceptable levels. Groundwater treatment might be accomplished by filtration, air stripping for volatile compounds, or stage dewatering methods. A permit variance may be necessary for effluent parameter to meet discharge standards. Construction dewatering would require coordination with CDPHE to determine necessary treatment and handling of extracted water before final discharge/disposition. **Acid Rock Drainage** Excavation of road cuts in areas of mineralized rock would have the potential to introduce conditions for the leaching of metals from these excavated materials. Potential areas of mineralized rock requiring excavation will be specifically identified during Tier 2 studies. Tier 2 mitigation plans will ensure that acid rock drainage would not affect Corridor water quality through the implementation of appropriate BMPs and appropriate disposition activities for these materials. **Metal Highway Structures** Disturbance or replacement of highway structures such as painted guardrails, signs, or metal bridge components would require appropriate characterization and disposal according to CDPHE guidelines and requirements. **CDOT Requirements and BMPs** CDOT contractors are required to comply with Section 250, Environmental, Health and Safety Management of the CDOT Standard Specifications, when applicable. The specifications provide guidelines and requirements for health and safety measures during construction, the investigation and testing of contaminated materials, and procedures to use if contamination is encountered during construction. All petroleum products and other hazardous materials (for example, fuel, solvents) used for action alternatives' construction purposes would be handled and stored per CDOT BMPs to prevent accidental spillage or other harm to the project area. If suspected hazardous or petroleum products were encountered during construction, samples of the material would be collected and analyzed for metals, hydrocarbons, organic chemicals (volatile or semivolatile organic compounds), and other toxicity and characteristic parameters to determine what special handling and disposal requirements are appropriate. The telephone numbers for medical and emergency services would be maintained onsite. If any unplanned occurrence requires assistance, the site supervisor or designated person would contact the appropriate response team. **Historic Mine Waste** CDPHE and EPA coordination would be required for the handling of mine waste materials, and specific CDPHE and EPA approval may be required for construction disturbance of sites that are currently designated as NPL sites within the Clear Creek/Central City Superfund Area. Other Clear Creek historic mining sites that pose considerable threats to Clear Creek might also require specific regulatory actions under CERCLA. Regulatory authority for mine tailings and waste would fall under various state and federal programs, depending on where the waste is located and its designation under CERCLA. CDPHE would be the lead agency (working with EPA) for regulatory actions at the Clear Creek/Central City Superfund Area, and the CDPHE Solid Waste Division would have authority for mine tailings not covered by CERCLA. In addition, FHWA encourages "participation in transportation projects that include the use and redevelopment of contaminated sites when appropriate." Alternative implementation might offer a means to clean up contaminants that might not otherwise be addressed by means of the FHWA 1998 Brownfields Economic Redevelopment Initiative. The initiative, administered by EPA, provides assistance and incentives to agencies for the assessment, cleanup, and economic reuse of contaminated properties known as Brownfields.

Resource Topic	Issues	Mitigation
3.8, Regulated Material and Mining Waste (continued)	See previous page.	To address multiple regulatory authorities and to ensure consistent and effective handling of waste materials, CDPHE has recommended that CDOT's materials handling plan be formalized into a Memorandum of Agreement (MOA) between CDOT, EPA, and CDPHE (with involvement of the Solid Waste and CERCLA programs). This MOA would require that CDOT's proposed mine waste management be consistent with CERCLA cleanups that have taken place elsewhere in the area. The MOA would seek CDPHE's and EPA's prior approval of a Materials Management Plan, which includes results of waste pile sampling, a Corridor-wide plan based on performance goals similar to those required by the CDPHE Solid Waste Unit program, and site-specific details similar to the as-builts required by Solid Waste staff. CDOT will work with CDPHE and EPA to develop the Corridor-wide MOA, coordinate MOA activities with local watershed organizations, and provide for public comment as needed. A detailed discussion of the intended contents of the MOA is provided in Appendix I, Regulated Materials and Historic Mining. In general, CDOT would attempt to avoid disturbance of mine waste wherever possible. If avoidance would not be feasible, CDOT would characterize the mine materials and reuse the material onsite according to MOA procedures if possible. Offsite disposal of mine waste materials would be the least desirable mitigation option. Long-term impacts would include the potential to release contaminants from disturbance of mine waste (or other contaminants encountered in soil or groundwater) during construction activities. Such impacts could be avoided with appropriate handling of materials and implementation of state-of-the-practice erosion and sediment control plans. Although contaminant sampling and testing has not yet specifically been performed for mine waste materials within the alternative footprints, it is expected (based on previous studies) that much of these waste materials would have relatively low levels of contaminants and would not be within or from sites requiring specific CERCLA remedial actions. Such materials may be suitable for construction material uses, including backfill and landscaping. These materials would be stabilized and maintained during and after construction to minimize environmental impacts. In certain cases, highway improvements through proper handling and stabilization of these materials, would serve to enhance environmental conditions in the Corridor.
3.9, Social and Economic Values	• Projected doubling in population growth and buildout in housing in Corridor counties and towns • Correlation between population growth and growth in I-70 traffic • Employment and commuting—resort counties in the tourism-driven Corridor communities importing workers from adjacent counties • Economics and tourism—existing and projected I-70 congestion levels adversely affecting Corridor economic conditions	Measures to mitigate and avoid construction impacts on social and economic values would require coordination with Corridor communities. Efforts to control growth and maintain quality-of-life values in the Corridor are greatly dependent on localized efforts and "political will." Corridor-wide coordination, state involvement and support, and land use planning (see section 3.10, Land Use, for further discussion) would improve the ability of Corridor communities to maintain and protect social and economic values in light of I-70 actions. From a regional perspective, the results of the social and economic assessment indicate that the No Action and Minimal Action alternatives might suppress growth and cause economic conditions to fall well below design year +10 projections. In contrast, Combination alternatives are predicted to induce growth and cause economic conditions to slightly exceed design year +10 projections. The mitigation and avoidance decision-making process would likely require consideration of social and economic "tradeoffs."

3.19 Mitigation Summary

Resource Topic	Issues	Mitigation
3.10, Land Use	**Direct impacts:** Effects of alternatives on communities, related to alternative footprint and construction disturbance zones: • Property encroachment (required use of any portion of a property by an alternative) • Structure loss (structures required to be removed to accommodate the alternative) • Effect on property function • Change in property access • Effects on federal lands **Indirect impacts:** Effects of alternatives on communities, related to growth: • Growth and development in Corridor counties and towns • Effects on land use and patterns of development • Induced growth effects on environmental quality • Effects on federal lands	**Direct Impacts** CDOT would make all attempts to avoid acquiring properties or displacing structures. Where avoidance would not be reasonable or feasible, each alternative alignment would be designed to avoid as much conflict as possible with existing properties and associated land uses. To minimize impacts that could not be avoided, FHWA and CDOT would conform to the requirements set forth in the Uniform Relocation Assistance and Real Property Acquisition Policies Act (1970, referred to as the "Uniform Act," as amended in 1987) to provide a consistent policy for fair and equitable treatment of displaced persons. CDOT also would provide compensation and assistance with finding suitable sites for relocation. Construction impacts will primarily be mitigated through design refinement at the Tier 2 level of analysis. Conceptual techniques for mitigation of impacts could include the following: • Alignment shifts • Design variances • Cantilever walls • Compact interchange designs such as Single Point Urban interchanges and Tight Urban Diamond interchange **Forest Service Land Management** Tier 1 alternative designs include USFS land management avoidance measures: • Limit roads and other disturbed sites to the minimum feasible number, width, and total length consistent with the purpose of specific operations, local topography, and climate • Construct roads to minimize sediment discharge into streams, lakes, and wetlands • Reclaim roads and other disturbed sites when use ends, as needed, to prevent resource damage ARNF and WRNF resource specialists provided standards and guidelines (based on forest management plans, USFS 1997; USFS 2002) based on their review of existing PEIS issues and project alternatives. A list of these standards and guidelines for the protection of federal lands is categorized by forest and resource in Appendix K, Overview of Water Availability and Growth, and Forest Service Land Management. Standards are used to ensure that individual projects are in compliance with forest plans and are intended to limit project-related activities, not compel or require them. Deviations from standards must be analyzed and documented in a forest plan amendment. A guideline is a preferred or an advisable course of action or level of attainment. Guidelines are designed to achieve desired conditions (goals). Deviation from a guideline and the reasons for doing so are recorded in a project-level NEPA document and a forest plan amendment is not required. Avoidance and minimization of impacts on forest service special use permits would include efforts to minimize impacts beyond the existing I-70 right-of-way. Tier 2 studies will provide a more definitive determination of impacts on special use permits and will include conceptual mitigation plans. Mitigation planning would include coordination with the USFS and affected permit owners. Mitigation for impacts on special use permits would involve the following general measures: • Access to permitted areas/uses would be maintained during and after project alternative construction activities. This might include detoured access routes. • Permitted utility (electric, gas, fiberoptics, water) easements would be relocated and interrupted service would be minimized. • Structures (such as communication towers, recreation facilities, and recreation residences) would be relocated. **Indirect Impacts** This evaluation of indirect impacts found that numerous potential constraints on growth and land use exist in the Corridor. However, the degree to which these factors would influence future growth, especially in relation to highway improvements, is difficult to define, as discussed by FHWA (1992): *"Unfortunately, well-defined functional relationships between resources and the larger environmental systems upon which society may depend are seldom available to the decisionmaker. Usually, nothing more than general cause and effect relationships are understood… It may be more helpful to view these relationships not as absolutes, but rather in degrees of understanding."* Correspondence from EPA dated September 20, 2002, suggests exploration of a "sustainable growth" alternative that would include improvements greater than those of the Minimal Action alternative but less than those of constructing more extensive alternatives. These concepts would be considered in the evaluation of alternatives and mitigation planning. Mitigation measures for potential indirect impacts on land use and growth would require the efforts and cooperation of Corridor communities and state government, as discussed by FHWA (1992): *"Unfortunately, measures that would be appropriate to offset most future developmental impacts in the area of a project often will be beyond the control and funding authority of the highway program. In these situations, the best approach would be to work with local agencies that can influence future growth and promote the benefits of controls that incorporate environmental protection into all planned development."* The selected Corridor improvement alternative should support transportation access for Corridor socioeconomic interests and avoid the creation of additional development pressure in areas where numerous constraints to growth already exist. Land use planning and controls are key factors in the protection of environmental and community values. Mitigation planning would include coordination with Corridor-area communities. Decision-makers would be faced with tradeoffs during the process since Corridor growth is generally associated with Corridor economic growth, and efforts to limit growth/development might also limit economic growth.
3.11, Environmental Justice	• Potential displacement/relocation of low-income and minority residents. • Availability of affordable housing and low-income housing. • Impact on local commute times and availability of public transportation. • Increase in noise levels. • Potential for separating or bisecting low-income and/or minority communities and neighborhoods.	Based on what is known at this programmatic level, disproportionately high and adverse effects have not been noted for any minority or low-income populations per Executive Order 12898 regarding environmental justice. Should changes occur during Tier 2 analysis, the following would be implemented: • Avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority populations and low-income populations • Ensure the full and fair participation by all potentially affected communities in the transportation decision-making process • Prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority populations and low-income populations

Resource Topic	Issues	Mitigation

3.12, Noise	**Direct impacts:**
	• Increases in Corridor noise levels from project alternatives due to:
	  • Increased traffic volumes
	  • Addition of buses and rail systems
	  • Construction
	Indirect impacts:
	• Increased traffic on major access routes to highway interchanges and transit stations
	• Noise from growth in general
		A number of noise mitigation strategies can be applied to reduce highway noise. A brief description of each is provided below, along with information about its applicability to the Corridor. The following mitigation measures are considered general noise abatement techniques. Section 3.12, Noise, provides examples of site-specific treatments at community locations, their anticipated effectiveness, and possible concerns associated with their implementation. It should be noted that while these site-specific treatments show what the mitigation effectiveness could be, they are not recommended or proposed at this time. These measures will be considered where applicable in future Tier 2 studies. Noise mitigation measures will be evaluated for properties during these studies that meet the impact criteria under the appropriate regulations (FHWA/FTA) based on the future proposed alternatives.
		
		Noise Walls
		Strategy
		Noise walls are the most commonly employed form of noise mitigation. They reduce noise by blocking the line of sight between a source and a receptor, forcing the sound waves to diffract over the top of the wall. Noise walls are typically placed along the shoulder of the roadway and can be placed on structures (such as bridges and elevated roadways) if necessary. In certain circumstances walls can be placed outside the CDOT right-of-way. This would be appropriate for residences on a hill, where a wall along the roadway would not break line of sight. The cost-benefit of walls is taken into account by calculating the "cost per benefited receptor per dB(A) of reduction." In terms of benefit, a 5 dB(A) reduction is required. Otherwise, a wall would be only minimally effective.
		
		The most cost-effective way to increase the performance of a noise wall is to increase its height. However, height can be limited in some situations due to aesthetics, weight (for walls on structure), or shading of icy roadways. Absorptive treatments to reduce noise barrier reflections back into unprotected areas could enhance their effectiveness, as could irregular wall top patterns or curved or branched elements on the wall top.
		
		Noise Reduction
		When residences are level with the highway, a wall 15 feet tall will provide approximately 5 to 10 dB(A) of noise reduction. This would be a noticeable reduction, but the highway will still be audible. This applies only to residences located within 100 to 200 feet of the wall. Residences further back or located on a hill overlooking the highway will experience less reduction.
		
		Noise Berms
		Strategy
		Noise berms are typically preferred over walls for aesthetic reasons, particularly in the mountain environment. The main issue with berms is space, as they require a footprint that is about six times their height (that is, a berm 15 feet tall requires a footprint of 90 feet). This sort of land often does not exist in developed areas. In recent years, CDOT has been constructing earthen berms along parts of the Corridor.
		
		Noise Reduction
		Noise berms provide equal or better reduction than a noise wall of the same height. Also, they reflect very little noise to the other side of the road, which can be an issue with walls.
		
		Small Concrete Barriers ("Jersey Barriers")
		Strategy
		The 3-foot-tall solid concrete barriers that currently separate the eastbound and westbound lanes of I-70 in many locations would form the guideway for the Bus in Guideway alternatives and would separate the Rail with IMC alternative from the highway, thus providing some noise reduction.
		
		Noise Reduction
		Three to 5 dB(A) of noise reduction could be achieved for residences that are located (1) within 200 feet of the highway and (2) below the elevation of I-70 by at least 5 to 10 feet. Very little if any reduction would be provided by these barriers for residences located more than 200 feet from the highway or elevated above it.
		
		Reducing Speed Limits
		Strategy
		On I-70, speeds range from approximately 55 mph in curvy and hilly areas east of Idaho Springs to 65 mph in Vail to 75 mph in central Eagle County. A reduction in speed would result in a reduction of noise levels. Speed reduction is, of course, dependent on enforcement.
		
		Noise Reduction
		Realistically, it would not be feasible to reduce speed limits by more than 10 mph. If this were accomplished, it would reduce noise levels by only 1 to 1.5 dB(A). This reduction would be perceptible to some and not others, as the ability to perceive small changes in noise levels is a complex and subjective phenomenon.
		
		Acquisition of Property to Form Buffer Zone
		Generally, this mitigation measure is a viable alternative only for undeveloped lands where noise impact prevention is the goal. Property acquistion for a buffer zone would be difficult to implement on this project, as I-70 is generally located in narrow valleys that are already at least partially developed.

3.19 Mitigation Summary

Resource Topic	Issues	Mitigation
3.12, Noise (continued)	See previous page.	**Alteration of Horizontal Alignment** To provide perceptible noise reduction (at least 3 dB(A)) at a given receptor, the distance that currently exists between the receptor and the highway would need to be doubled. This would not be a viable mitigation option in the Corridor, given the land constraints. Also, in many cases this action would only shift the impact to receptors on the opposite side of the highway, and would be extremely costly. **Alteration of Vertical Alignment** Changing the vertical alignment of I-70 (that is, lowering its elevation by depressing it into the ground) could provide considerable noise reduction at roadside receptors. However, this mitigation option is not feasible in many areas along the Corridor due to drainage and floodplain issues that would prohibit construction. It is feasible in other areas in terms of constructibility, but the costs are significant. The idea of depressing I-70 into the ground and covering it with a structure has been discussed in Vail, as the land it would create for development could help offset the cost. **"Jake Brakes"** Use of unmuffled "jake brakes" by large trucks is an annoyance issue in the Corridor. Noise walls are minimally effective in reducing this noise, as it is generated at the mouth of the exhaust stack, which is located as much as 10 feet off the surface of the road. "Jake brake" noise is effectively reduced if the truck is equipped with a working muffler. Enforcement of muffler use is the most direct noise mitigation measure. Existing state law imposes a $500 fine for commercial vehicles without a muffler. **Noise Insulation of Buildings** Insulation or soundproofing of buildings typically involves installation of double-pane windows that are specially designed to provide a high degree of noise attenuation. CDOT guidelines state that noise insulation only be applied to public or nonprofit buildings such as schools and churches, unless there is a severe impact (absolute noise levels of 75 dB(A) or an increase of 30 dB(A) over existing levels) and other exterior noise mitigation measures are as cost-effective. **Pavement Type** Different pavements exhibit different levels of noise for a given traffic flow. Current research indicates that new asphalt is somewhat quieter than new concrete. However, the duration in years of this benefit is unclear. It is known that concrete is generally more cost-effective than asphalt in the long term. Therefore, at this time asphalt is not viewed as a noise mitigation measure in and of itself. **Active Noise Control** Active noise control is a method where noise from the source of interest is measured with a microphone, speakers then broadcast the measured noise after it has been digitally processed to be 180 degrees out of phase with the incoming noise. The noise from the speakers then cancels out the undesired sound. This technology has been applied with some success to noise inside aircraft and to engines. However, the technology is nowhere near advanced enough to be applied to highways.

3.13, Visual Resources	• Change to landscape setting and scenery
	• Change within sensitive viewsheds:
	  • Adjacent to the interstate (views from communities and recreation areas)
	  • From the interstate itself (views from I-70)
	• Compliance with USFS and BLM visual resource management prescriptions
		Mitigation measures for visual resources center on reducing visual contrast associated with implementation of project alternatives. Because visual contrast is most closely associated with addition of structural elements and change to landform characteristics, the following mitigation measures are organized into those related to landform and those related to structures. Additionally, mitigation and coordination concepts related to possible induced growth are provided in section 3.9, Social and Economic Values.
		Mitigation measures for visual resources will be developed and refined at the Tier 2 level of study in the context of a project. However, techniques to reduce impacts could include the following:
		Landform
		• Implement sensitive grading techniques that blend grading with the natural terrain
		• Treat all disturbed slopes for erosion control; revegetate using native plant species as appropriate for adjacent land use and terrain
		• Reduce color contrast through rock staining in areas of new rock cuts
		• Selectively clear areas where alternatives encroach on forest edge
		Structures
		• To the extent possible, use structures that are simple, slim, and low-profile with minimal bulk and horizontal emphasis, avoiding over-monumentation, reducing structure depth as compared to deck edge, and keeping structures proportional
		• Design colors of structures to complement the natural landscape
		• Design tapered and rounded forms and edges where appropriate to soften appearance and reduce perceived bulk (for example, on bridge piers)
		• Use repeating colors and textures to provide continuity with other structural features such as retaining walls
		Induced Growth
		The selected alternative would support transportation access for the Corridor in a way that minimizes damage to visual resources. Land use planning and controls are a key factor in the protection of all environmental and community values. Mitigation planning is also important and will involve coordination with Corridor-area communities. Decision-makers will be faced with tradeoffs during the process because improved transportation access is generally associated with economic growth, and efforts to limit access for the protection of environmental and community resources might also limit economic growth.

Resource Topic	Issues	Mitigation
3.14, Recreation Resources	• Recreation sites within the Corridor are important destination areas for the state of Colorado and the nation. • Several areas of national significance (Aspen, Vail, Eagles Nest and Ptarmigan Wilderness Areas, Continental Divide National Scenic Trail) are accessed by the Corridor. • Fifteen major ski areas and resorts are accessed from the Corridor (out of 26 ski resorts statewide). • WRNF and ARNF are among the top 10 most visited forests in the nation. • Direct access to the Corridor area from Denver International and Eagle County airports contributes to the Corridor-area recreation sites being major destinations for travelers around the US and abroad. • "Increasing demands for unconfined recreation have exceeded the agency's (Forest Service) ability to manage for high quality recreation opportunities within the capabilities of land and budget." (USDA 2004)	Efforts to avoid direct impacts on recreation resources are included in the design of I-70 footprints. Tier 2 studies are necessary to maximize these efforts. The potential to mitigate impacts associated with project alternatives would vary with the type and level of impact incurred. Impacts on recreation resources anticipated to be most easily mitigated are associated with crossing of a trail where there is an existing I-70 crossing. As long as the crossing is maintained with the implementation of the alternative, the impact would be avoidable. Potential for mitigation varies, from areas of potential encroachment on the edge of a park that would not affect the property function to displacement of a portion of a trail that could be accommodated within the alternative template to encroachment on a park or recreation site where the function of the site would be impaired or displacement of a portion of a trail would be difficult to accommodate within the alternative template. Primary mitigation measures that are recommended to avoid or reduce effects would be replacement (or enhancement of functions) of parkland/trail due to encroachment or disruption from project alternatives, project design to reduce the area of effects, and realignment of affected trails. Mitigation of indirect impacts would include USFS consideration of forest management plans and the continuing and evolving use of management techniques. One technique used to manage forest visitation and use is to provide areas for information dissemination relating to forest recreation opportunities, rules and regulations, low-impact recreating principles, and educational experiences. Another key factor in forest management is the building and maintenance of recreation use facilities (such as trash collection, restrooms, picnic areas, camping areas, trails, and roads). These facilities are required not only for forest visitor/recreationist use, but also to protect forest resources and watersheds. Ongoing management techniques include reservation requirements, activity restrictions for specific areas, permit systems, restricted access, and user fee systems. The availability of resources and funding for implementation of forest management techniques is a major factor in both the accommodation of increased visitation and the protection of forest resources. Such issues involve community/agency coordination activities suggested as strategies in the 2003 Forest Service Colorado Recreation Strategy documents. The Statewide Comprehensive Outdoor Recreation Plan (SCORP) suggests these goals can be achieved by establishing funding partnerships through regional collaborative forums and through state/federal cost-share agreements to renovate federal properties. The SCORP acknowledges CDOT's role in outdoor recreation management through its roles in statewide transportation planning, distribution of federal Transportation Enhancements funds and Recreational Trails Program funds, and the Scenic Byways Program. *"Public access to outdoor sites and management of travel on public lands is challenged by the capacity of our statewide transportation infrastructure and of our natural resources sites to accommodate the volume of demand."* Related SCORP strategic actions include: • Make mountain pass access nodes an explicit part of the CDOT Corridor Visions regional plans. Plan for parking, transit stops, sanitary facilities, and recreation use zones. • Implement the "Snow Park" concept currently used by other states to manage demand for winter recreation. Establish parking fees to finance snow removal and recreation management presence. • Pay special attention to OHV management through collaborative processes to identify trail networks and through identification of "hot spots" that require focused management strategies. Facilitate efficient access to recreation sites from transportation networks. Include outdoor recreation and tourism in the CDOT regional planning processes. Consider intermodal transportation networks and transportation hub development. Consider off-peak use incentives. Consider river access "hot spots" mitigation actions. Increase the capability to access recreation sites on mountain passes from road networks.
3.15, Historic Properties	Direct and indirect effects on: • Properties listed on or eligible for the National Register of Historic Places (NRHP) • National Historic Landmarks (NHL) • Properties listed on or eligible for the State Register of Historic Places (SRHP) • Local landmarks and sites of local interest • Traditional cultural properties of concern to Native Americans	Mitigation strategies would include avoiding or minimizing effects on historic properties. Avoidance of potential effects on historic properties at the Tier 1 level is the goal of the PEIS. Mitigation for any adversely affected properties would be determined in consultation with the SHPO and consulting parties at the Tier 2 level after eligibility and effects determinations are made. Construction monitoring of any archaeological sites would be performed in consultation with Native American tribes as appropriate, according to the stipulations present in the Tribal Consultation PA (see Appendix N, Historic Property Survey, Native American Consultation, and Paleontological Resources). As a result, at the Tier 1 conceptual level of study, direct effects on properties in the Corridor, including those in historic districts and historic areas, would have the potential to be avoided and minimized. Final determination for direct, noise, and visual effects on the significance of the historic properties will be made in Tier 2. Mitigation strategies described in section 3.12.2.6 would include noise wall, noise berms, small concrete barriers ("jersey barriers"), reduction of speed limits, acquisition of property to form buffer zones, alteration of vertical and/or horizontal alignments, enforcement of state law for mufflers regarding "jake" brakes, noise insulation for buildings, pavement type variations, and active noise control techniques. These measures will be considered where applicable in future Tier 2 studies. Noise mitigation measures will be evaluated for properties during these studies that meet the impact criteria under the appropriate regulations (FHWA/FTA) based on the future proposed alternatives.

3.19 Mitigation Summary

Resource Topic	Issues	Mitigation
3.16, Section 4(f) Evaluation		The purpose of mitigation measures with respect to the 4(f) resources is to avoid or minimize harm caused by construction and/or operation of alternatives. During subsequent Tier 2 NEPA studies, avoidance, minimization of harm, and mitigation measures will continue to be investigated. These measures will be evaluated based on coordination and cooperation with concerned agencies and organizations at the local, state, and federal levels. The following general measures can be considered individually or in combination with other measures, depending on the identified use, which will be analyzed in greater detail at the project-specific design level. **Recreation Resources** Typical mitigation measures to avoid or minimize harm for anticipated use of recreational resources include, but are not limited to: • Modifying project design to avoid or minimize physical alteration • Modifying construction methods to avoid or minimize construction-related temporary use • Minimizing indirect effects on properties by including vegetation screening at appropriate at-grade and above-grade locations • Incorporating environmentally sensitive design features into structural components of the project, such as bridges and sound walls • Minimizing use of trails by locating trails into alternatives' templates and maintaining existing crossings • Mitigating park lands and recreation facilities by replacing the affected facilities or by enhancing other nearby facilities **Historic Buildings and Structures** Typical mitigation measures to avoid or minimize harm for anticipated use of historic buildings and structures include, but are not limited to: • Modifying project design to avoid or minimize physical alteration • Modifying construction methods to avoid or minimize construction-related effects • Minimizing visual effects on properties by including vegetation screening at appropriate at-grade and above-grade locations • Incorporating sensitive design of structural components of the project, such as bridges and sound walls • Minimizing vibration by including shock absorbing materials and employing construction techniques to reduce vibration from construction equipment and vehicles • Ensuring design compatibility with the historic setting and character of individual resources and historic districts • Consulting with the SHPO, NPS, applicable Certified Local Governments (CLG), or consulting parties on project design elements that may damage, alter, or obscure the view to or from NRHP listed or eligible resource (the NPS would be involved only when NHLs are affected, and the CLGs or consulting parties should be involved when the properties are within their jurisdiction)

Resource Topic	Issues	Mitigation
3.17, Paleontological Resources	Direct and indirect impacts on significant nonrenewable paleontological resources, including: • Fossil remains of vertebrates, invertebrates, and plants • Fossil footprints and trace fossils • Significant paleontological sites • Taphonomic (conditions and processes of fossilization) context • Stratigraphic record	The following mitigation measures have been developed to reduce adverse impacts of project construction on paleontological resources to a less than significant level. The measures are derived from the guidelines of the Society of Vertebrate Paleontology and meet the requirements of the Bureau of Land Management, US Forest Service, and the National Academy of Sciences. These mitigation measures have been used throughout the western US and have been demonstrated to be successful in protecting paleontological resources while allowing timely completion of construction. As a nonrenewable resource, paleontological resources are unique. At the time fossils are discovered, they have already been subjected to various destructive processes, including predation, scavenging, disarticulation, transport, primary weathering, diagenesis, erosion, secondary weathering, and damage through ground disturbance. It is difficult to develop measurable performance standards for paleontological mitigation because (1) fossils have been damaged by natural processes before their discovery, (2) fossils are typically further damaged by construction activities that reveal their presence to paleontological monitors, and (3) there is no way to quantify how many fossils exist at the project site but were not exposed during construction. Therefore, the absence of fossils would not indicate failure of the mitigation measures. Paleontological mitigation seeks to salvage as many significant fossils as possible before their destruction during human-mitigated ground disturbance. Measurable performance standards in paleontology apply to monitoring and mitigation procedures, which ensure that fossil sites are documented thoroughly and accurately, and that fossils are collected according to professional paleontological standards. The following are mitigation measures relevant to Tier 1 level of detail. Programmatic and project-specific mitigation measures are described below. **Programmatic Mitigation Measures** *Preconstruction Survey and Excavation* Paleontological assessments of potentially sensitive geologic units along the Corridor would include a literature and museum record search to determine whether any previously known fossil localities occur within or near the project Corridor, and a field survey of project areas containing geologic units with moderate and high paleontological sensitivity. Mitigation during field survey would include documentation and collection of surface fossils. The results of the searches and field survey would be compiled in an assessment report, which would include recommendations for additional paleontological mitigation work, including construction monitoring in moderately or highly sensitive units. The assessment report could recommend additional surface collecting, systematic excavation of a representative sample of the fossils present at a known locality before construction, and/or construction monitoring. *Construction Monitoring* • Paleontological monitoring would include inspection of exposed rock units and microscopic examination of matrix to determine if fossils are present. This work would take place during construction. Paleontological monitors would follow earth-moving equipment and examine excavated sediments and excavation sidewalls for evidence of significant fossil resources. The monitors would have authority to temporarily divert grading away from exposed fossils to professionally and efficiently recover the fossil specimens and collect associated data. All efforts to avoid delays to construction would be made. • If construction personnel find any subsurface bones or other potential fossils during construction, work in the immediate area would cease immediately and the CDOT staff paleontologist or other qualified and permitted paleontologist would be contacted immediately to evaluate the significance of the find. Once salvage or other mitigation measures (including sampling) are complete, the paleontologist would notify the construction supervisor that paleontologic clearance has been granted. • Paleontological monitors would be equipped with the necessary tools for the rapid removal of fossils and retrieval of associated data to prevent construction delays. This equipment includes handheld GPS receivers, digital cameras, cell phones, and laptop computers, as well as a toolkit containing specimen containers and matrix sampling bags, field labels, daily monitoring forms, field tools (such as awl, hammer, chisels, and shovel), and a plaster kit. Trucks would transport specimens and samples to an appropriate paleontological laboratory for processing. • In the laboratory, all fossils would be prepared, identified, analyzed, and inventoried. Specimen preparation and stabilization methods would be recorded for use by the designated curation facility. All specimens would be transferred to the designated curation facility and accompanied by the final paleontologic resources report and all data in hard and electronic copy. • A final paleontological resources report would include the results of the monitoring and mitigation program, an evaluation and analysis of the fossils collected (including an assessment of their significance, age, and geologic context), an itemized inventory of fossils collected including photographs where appropriate, an appendix of locality and specimen data with locality maps and photographs, an appendix of curation agreements and other appropriate communications, and a copy of the project-specific paleontological monitoring and mitigation plan.

Resource Topic	Issues	Mitigation
3.17, Paleontological Resources (continued)	See previous page.	**Project-Specific Mitigation Measures** *Preconstruction Survey and Excavation* Before construction, a qualified and permitted paleontologist would be retained to conduct project-specific paleontological assessments in areas of high, medium, or unknown paleontological sensitivity. Literature and museum record searches would be conducted to determine whether previously documented fossil localities occur within or near the project area, or elsewhere within the same geologic unit. Depending on the results of the searches, the anticipated impact on the unit, and the unit's sensitivity, a field survey would be required. The field survey would include a visual inspection of all potentially fossiliferous outcrops within the study area. All fossil occurrences, whether significant or not, would be documented. Documentation would include a complete record of the geographic coordinates and stratigraphic context of the fossils, and the lithologies of the fossil-bearing strata. All significant fossils would be collected during the survey, if possible, depending on the number present and their size. This is because it is often difficult to relocate small fossils, and erosion and weathering are adverse impacts on fossils that can be prevented if the fossils are collected and removed from the site. The results of the searches and field survey would be analyzed and presented in an assessment report. This report would include a discussion of the geology and paleontology of the project area, a paleontological sensitivity evaluation, a list of all fossils collected and/or observed and their significance, fossil locality data sheets, the paleontological permit number under which the work was performed, and the name of the curation facility in which the fossils were reposited, if applicable. The assessment report would also include resource mitigation recommendations. If no significant fossils were found in the searches and/or observed during the field survey, paleontologic clearance would typically be recommended. If all the significant fossils or a statistically significant sample thereof were collected from the surface of the locality during the survey, paleontologic clearance would also typically be recommended. Additional mitigation work would be recommended if significant fossils were known to remain on the surface or were partially exposed, or if there is a high probability that significant subsurface fossils exist in the study area. This work could include additional surface collecting or systematic excavation of a locality to salvage a significant fossil or collect a statistically significant sample of the fossil taxa present at the locality. If significant subsurface fossils may be further affected during ground disturbance, construction monitoring may be recommended. *Construction Monitoring* • Before the construction permit is issued, a qualified and permitted paleontologist would be retained to produce the mitigation plan and would be responsible for implementing the mitigation measures. This includes supervising the monitoring of construction excavations in areas with paleontological sensitivity (see below). • The qualified paleontologist would attend preconstruction meetings to consult with the grading and excavation contractors. • Language would be placed in the construction specifications to state that the paleontological monitor would be onsite during grading or trenching operations. The construction contractor would be instructed via the written specifications and at the preconstruction meeting to stop construction if fossils, as verified by the paleontological consultant, were unearthed. Work would cease in the vicinity of the fossils so that they could be recovered and removed from the site. • All project personnel would be required to attend a Worker Awareness Training Program before initiation of construction activities. The qualified paleontologist would administer the paleontologic resource portion of the training program. The program would educate construction personnel on the types of fossils that could be found in project excavations, their appearance, and penalties for illegal collecting. • If microfossils were present, the monitor would collect matrix for processing. To expedite removal of fossiliferous matrix, the monitor may request heavy machinery assistance to move large quantities of matrix out of the path of construction to designated stockpile areas. Testing of stockpiles would consist of screen-washing small samples (approximately 200 pounds) to determine whether significant fossils were present. Productive tests would result in screen-washing of additional matrix from the stockpiles to a maximum of 6,000 pounds per locality to ensure recovery of a scientifically significant sample. • At each fossil locality, field data forms would be used to record the locality, measured stratigraphic sections, and appropriate scientific samples that were collected and submitted for analysis. • In the event of discovery of unanticipated fossil remains such as unexpected concentrations of fossils, unusually large specimens, or unexpected discoveries in sediments, all ground disturbance in the area would cease immediately. The qualified paleontologist and appropriate project personnel would be notified immediately to assess the significance of the find and make further recommendations. *Mitigation Measures in Areas of High Paleontological Sensitivity* Before initiation of any earth-moving construction activities in rock units of high paleontological sensitivity, a preconstruction paleontological survey and the Worker Awareness Training Program would be required, followed by continuous paleontological monitoring during all phases of construction. This monitoring protocol would apply to construction activities that occur in the Morrison Formation, the Pierre Shale Formation, and the Denver Formation. *Mitigation Measures in Areas of Moderate Paleontological Sensitivity* Before initiation of any earth-moving construction activities in those formations with moderate paleontological sensitivity, including the Minturn, Dotsero, Manitou, Chaffee Group, Leadville Limestone, Belden, Eagle Valley, Maroon, Fountain, Lyons Sandstone, Chinle, Ralston Creek, Dakota Sandstone, South Platte, Lytle, Benton Shale, Fox Hills Sandstone, Laramie, and Arapahoe Formations, a preconstruction paleontological survey and the Worker Awareness Training Program would be performed. Construction work conducted in these units would be then monitored on a spot-check basis. *Mitigation Measures in Areas of Low Paleontological Sensitivity* Pleistocene and early Holocene surficial deposits such as alluvium, colluvium, talus, landslide deposits, and glacial deposits have a low paleontological sensitivity ranking. A Worker Awareness Training Program would be conducted before the initiation of any construction activities. Monitoring would not be required, but spot-checking may be conducted in certain areas at the discretion of the CDOT staff paleontologist or project paleontologist. In the case of the Quaternary deposits, this would ensure that older underlying fossiliferous sediments were not being affected.