7.0 MITIGATION

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7.1 INTRODUCTION

This chapter discusses potential mitigation options for the environmental impacts identified in Chapter 5.0, *Environmental Consequences,* for both the Preferred Alternative and the Other Alternative. The final mitigation measures will be presented as part of the Selected Alternative that will be developed in the Record of Decision (ROD).

7.2 SOCIOECONOMIC

7.2.1 Neighborhood

No neighborhood impacts are anticipated as a result of the Preferred Alternative or the Other Alternative; therefore, mitigation is not required.

7.2.2 Environmental Justice

No environmental justice impacts are anticipated as a result of the Preferred Alternative or the Other Alternative; therefore, mitigation is not required.

7.2.3 Relocation

Relocations will be conducted in accordance with the ***Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970***, as amended (1989). Relocation brochures are available without discrimination to all residents and businesses that are required to relocate. The Act includes assistance to re-establish a business operation and to secure comparable replacement housing. It also provides for "housing of last resort" in the event that comparable housing cannot be secured at the time that the project is scheduled to proceed. Both residential and business relocations will be completed on a case-by-case basis, taking into consideration the circumstances of the displaced resident or property and the status of the project. The process includes initial property appraisal, determination of just compensation, negotiations, payment, relocation, and rights under eminent domain. Benefits under the Act, to which each eligible owner or tenant may be entitled (including early [or hardship] acquisition), will be determined on an individual basis and explained to them in detail, in addition to information regarding their financial options.

No relocations are anticipated as a result of the Preferred Alternative or the Other Alternative along the I-25 Corridor. Nine relocations are required along US 85 based on the conceptual design of the Preferred Alternative and the Other Alternative; six sites are commercial, and three are residential.

The conceptual design will be refined in developing the Selected Alternative for US 85. Once the Selected Alternative is defined, it will be presented in the ROD, scheduled to be signed in the spring of 2001. Once the ROD is signed, design and construction may begin. Based on the design of the Selected Alternative, these ten relocations may or may not be required. Also, under the current funding scenario, improvements to the entire corridor may take up to 20 years to construct. Due to these two factors, property acquisition will not likely start until immediately prior to construction.

7.2.4 Right-of-Way Acquisition

The right-of-way (ROW) acquisition process follows the ***Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970***, as amended (1989). The process provides for fair and equitable treatment of those properties that will be acquired. The process includes initial property appraisal, determination of just compensation, negotiations, payment, and rights under eminent domain. The ROW acquisition process, which involves authorization of final ROW plans, parcel appraisal, and acquisition of the needed parcels to construct the project, begins during final design. In many cases, the ROW acquisition process continues just prior to the start of construction. The Federal Highway Administration (FHWA); however, will not release construction funds until the Colorado Department of Transportation (CDOT) demonstrates they are nearly complete with the ROW acquisition process. Completion of the ROW process lasts 1-2 years for projects involving many acquisitions and approximately 6 months for projects with few acquisitions.

7.2.5 Recreational Resources

No mitigation measures for recreational resources are associated with the Preferred Alternative and Other Alternative along the I-25 Corridor.

A more friendly bicycle environment is created in conjunction with the Preferred Alternative and the Other Alternative along the US 85 Corridor. Currently no sidewalk or bikeway exists along US 85. The shoulders are between 0.6 meters (2 feet) and 2.4 meters (8 feet) wide, thus making it difficult to bike on the current configuration. Improvement alternatives include a grade-separated crossing for pedestrians and bicycles at the High Line Canal Trail and an improved crossing for the Centennial Trail. The current crossing of the Centennial Trail at the C-470 Interchange has been improved by extending the trail south to Blakeland where bicycles and pedestrians can cross at the traffic signal.

An analysis was completed to determine the opportunities available for a detached bicycle/pedestrian facility. In some areas, a detached bicycle/pedestrian facility does not fit due to the environmental impacts the facility causes. The Preferred Alternative and the Other Alternative include:

- An attached facility in the form of a sidewalk from C-470 to Blakeland Drive
- A detached facility from Blakeland Drive to Highlands Ranch Parkway
- An attached facility in the form or a widened shoulder from Highlands Ranch Parkway to Titan Road
- An attached facility in the form of a sidewalk from IREA to Daniels Park Road
- A detached facility from Daniels Park Road to Meadows Parkway

CDOT will maintain the bikeway/shoulder with regular sweeping.

7.2.6 Land Use and Zoning

Land acquired by CDOT will be used as a transportation corridor. This acquisition will be minimal; therefore, mitigation is not required.

7.3 PHYSICAL IMPACTS

7.3.1 Air Quality

No substantial air quality impacts are projected as a result of the Preferred Alternative or the Other Alternative; therefore, mitigation is not required.

7.3.2 Water Quality and Quantity

CDOT is concerned with erosion, sedimentation, and stormwater runoff impacts to both water resources and water quality resulting from highway construction activities. CDOT recognizes that the best approach for avoiding impacts is to ensure sufficient distance between the road alignment and Waters of the US, follow terrain contours to avoid headcutting and other erosion/slope stability issues, and locate the transportation corridor away from high erosion hazard areas. It is not always possible to completely avoid impacts to wetlands and Other Waters of the US. These potential impacts are considered during planning and design phases of CDOT projects and mitigated through the use of best management practices (BMPs), which are implemented as temporary or permanent project features. The following paragraphs identify mitigation measures that will be implemented for both the I-25 Corridor and the US 85 Corridor to mitigate direct, secondary, and cumulative water quality impacts to an acceptable level during construction and operation and maintenance (O&M) of the Selected Alternative presented in the ROD.

CDOT will comply with appropriate federal (e.g., Clean Water Act sections 401, 402, and 404) and state legislation (e.g., Colorado Water Quality Control Act, Title 25, Article 8, CRS) to ensure that project-related impacts do not result in additional water quality degradation over current conditions. CDOT will also take reasonable steps to comply with local regulations or special requirements. Examples of local requirements include Douglas County Erosion Control Criteria and the Chatfield Reservoir and Cherry Creek Reservoir Control Regulations. Douglas County's erosion control criteria limit the release of sediment to historic levels plus 15 percent during construction activities, and sediment discharges must return to historic levels after construction. The Chatfield Reservoir and Cherry Creek Reservoir Control Regulations require the implementation of erosion and sediment control BMPs to prevent nonpoint source pollution (i.e., phosphorus loading) of Cherry Creek and Chatfield Reservoirs. Potential construction-related impacts to water resources and water quality will be further reduced by adherence to conditions included in any United States Army Corps of Engineers (USACE) Section 404 permit and the Colorado Discharge Permit System (CDPS) general permit that will be issued to cover construction-related stormwater discharges (Construction Stormwater Discharge Permit).

CDOT will obtain a Construction Stormwater Discharge Permit(s) for the Selected Alternative presented in the ROD. This permit is currently required for construction activities that disturb more than 2 hectares (5 acres). After 2002, the permit will be required for disturbing more than 0.405 hectare (1 acre). The Construction Stormwater Discharge Permit requires preparation of a Stormwater Management Plan (SWMP), site inspections every 14 days, and specific erosion control and pollution prevention requirements. The SWMP is project-specific and will be prepared during the design phase. The SWMP will specify and describe BMPs needed to mitigate any potential adverse impacts to surface water quality resulting from construction activities in the I-25 Corridor and US 85 Corridor. The use of BMPs is crucial during the construction phase to prevent the transport of phosphorus

into the Chatfield Reservoir and Cherry Creek Reservoir and to prevent adverse water quality impacts to rare aquatic species or habitat in Plum Creek and East Plum Creek. Erosion and sedimentation BMPs can be used to control phosphorus loading to surface waters. During construction, CDOT will use the following BMPs to prevent the transport of sediment and other contaminants in stormwater runoff:

- Install perimeter erosion control measures (e.g., straw bales, filter fences, or vegetated buffer strips) as required in environmentally sensitive areas prior to grading.
- Divert clean water runoff during construction.
- Time ground-disturbing activities at erosion-prone sites or sites adjacent to Waters of the US shall be minimized during the wet spring months when saturated soils are susceptible to compaction and movement, and when surface and groundwater levels are at their highest.
- Sequence and stage construction so that no area remains exposed for an unnecessarily long time. Cleared areas should be stabilized before other areas are disturbed.
- Implement stabilization BMPs (e.g., mulching, cover crops, erosion control blankets, or a combination depending on local site conditions) after grading.
- Rip and till soils that have been over-compacted by heavy equipment to break up restrictive layers; then harrow or roll to firm the seedbed prior to revegetation. Soil surfaces will be treated to lessen wind damage to young plants and promote moisture retention and surface water infiltration.
- Develop and carry out a regular maintenance schedule for erosion and sediment control practices.
- Use spill prevention and containment measures at storage sites.
- Develop and implement a schedule for regular collection and disposal of waste material.
- Locate appropriate concrete washout areas well away from Waters of the US, riparian areas, or floodplains.

Additional project development specific BMPs will be detailed in the SWMP created for the Selected Alternative.

In addition to adhering to the SWMP, the construction contractor will also adhere to CDOT water quality and erosion control management specifications. As the project progresses, the Colorado Division of Wildlife (CDOW) will be consulted on specific water quality mitigation to avoid impacts to rare fish species inhabiting, or with habitat, in Plum Creek and East Plum Creek. Construction-related impacts to water quality will be mitigated by minimizing the number of piers placed in Waters of the US. Bridges will be anchored outside the bed and banks of East Plum Creek and other project area tributaries, whenever possible.

Drainage systems are expected to be the primary means for mitigating potential impacts to water resources and water quality from operation and maintenance of the selected alternatives. Final design of the selected

alternatives will include appropriately sized drainage structures and stormwater quality management BMPs to minimize any project related water quantity or quality impacts (i.e., phosphorus loading) to downstream surface waters. The Chatfield and Cherry Creek Reservoir Control Regulations set goals of 50 percent reductions in nonpoint source phosphorus loading from upstream watersheds. BMPs that control sedimentation and erosion, such as those previously described, can be used to reduce phosphorus in stormwater. In addition, Douglas County Storm Drainage Design and Technical Criteria recommend the use of detention basins followed by filtration or rapid infiltration to meet phosphorus reduction goals, where prudent.

CDOT will use a combination of stormwater quality management BMPs, including detention and infiltration basins, to protect downstream water quality, channel stability, and property owners from adverse stormwater impacts. Selection of stormwater quality management BMPs will depend on local topography, drainage area size, available land, proximity to Waters of the US, and the final designs for the selected alternatives. CDOT may be required to purchase additional right-of-way to accommodate permanent mitigation measures (e.g., detention and infiltration facilities). Lastly, good road maintenance and cleaning and stabilization of roadside ditches will reduce pollutant loadings from these sources.

7.3.3 Vegetation

Impacts to native vegetation have been minimized where possible. For example, along US 85 ROW take has been minimized along the entire alignment. Sideslope grades were adjusted, and guardrails and retaining walls were incorporated into the design. Construction BMPs in accordance with CDOT's ***Erosion Control and Stormwater Quality Guide***, 1995, and as directed by CDOT, will be implemented to minimize unavoidable impacts to native vegetation. These BMPs will include, but are not limited to, the following:

- Fencing of construction zone and access points at specific locations to limit impacts outside the project area.
- Develop landscape management practices to avoid the removal of vegetation where possible.
- Implementing temporary and permanent erosion control measures such as revegetating disturbed areas with native grasses, mulching, erosion control blankets, sediment basins, erosion bales, and silt fences.
- Grading and seeding incrementally to reduce soil loss during construction. Native grasses should be used in seed mixes. Native shrub species should be added to the seed mix in areas where conflicts with maintenance can be avoided.
- Using native grass species. For areas identified as having moderate to high erosion potential, fast-growing, non-native cover species should be included in the seed mix to minimize soil loss while native species establish. Seeding rates will be determined by CDOT.
- Rounding of ditches and slopes to prevent unnecessary erosion.
- Inventorying and mapping, prior to construction, state listed noxious weeds in the ROW and adjacent areas of both corridors using North America Weed Management (NAWMA) protocols. The mapping must be compatible with the current CDOT geographic information system (GIS).

- Analyzing the potential spread of identified noxious weeds due to construction activities.

- Developing and implementing a site-specific integrated pest management plan (IPMP) that focuses on the prevention and elimination of noxious weed species in the project area.

- Measures such as coordination with other agencies; appropriate herbicide selection and timing of herbicide spraying; using backpack herbicide sprayers in or around sensitive areas (e.g., wetlands or riparian areas); cleaning equipment between sites to reduce the spread of noxious weeds; hand pulling, stripping, and removing topsoil; re-seeding areas with native seed, may be included in the IPMP.

- Using certified weed-free mulch and inspecting as regulated by the Weed Free Forage Act (Title 35, Article 27.5, CRS).

- Reseed vegetation as necessary to maintain good erosion control practices.

Shrubland, woodland, and riparian areas will be denoted on the construction plans. Impacted shrubs and trees will be replaced contingent upon water availability and ROW maintenance.

7.3.4 Wetlands

In accordance with Clean Water Act Section 404 (b)(1) Guidelines, wetland mitigation is identified as avoidance, minimization, and compensatory mitigation. These guidelines stress the avoidance of adverse impacts to wetlands with the goal of no overall net loss of wetland functions. Consideration for avoidance and minimization of impact to wetlands will be given throughout the design and construction process. However, because avoidance is not possible across an entire alignment, mitigation includes minimizing or compensating unavoidable impacts.

Design features such as alignment shifts and construction alternatives (e.g., retaining walls and steeper side slopes) were considered to avoid or minimize impacts to wetlands and Other Waters of the US. For example, impacts to wetlands may be minimized by using a steeper catch slope. Currently, the catch slope is at 4:1 (4 horizontal, 1 vertical). Where possible, this slope may be adjusted to a 2:1 with the addition of a guardrail. The avoidance of many of the non-jurisdictional wetlands in ditches is not possible due to their location adjacent to the roadways. Similarly, the avoidance of Other Waters of the US is not possible due to their crossing of the highways.

Implementation of BMPs discussed in the ***Erosion Control and Stormwater Quality Guide,*** 1995, minimizes impacts to wetlands and Other Waters of the US. Specific measures to reduce erosion and maintain water quality will be identified by CDOT and include the following:

- Grading and seeding incrementally to reduce soil loss during construction. Native grasses should be used in seed mixes. Non-native cover species should be added to the seed mix when reseeding areas of moderate to high erosion potential to minimize soil loss while native species establish.

- Temporary fencing wetlands during construction. A 0.9-meter (3-foot) offset from the wetland boundary will be used when possible.

- Diverting clean water runoff during construction.
- Using soil stabilization practices such as rounding of ditches and slopes, erosion control blankets, re-seeding with native species, and mulching impacted areas to reduce erosion.
- Installing structural BMPs such as silt fences and erosion bales in impacted areas to reduce off-site siltation.
- Developing an emergency spill response program and implementing spill-prevention practices, such as locating staging areas, and fuel and hazardous construction material storage sites well away from wetlands and Other Waters of the US to reduce risks from accidental spillage and leaching.
- Disposing of surplus fill in non-wetland areas designated by CDOT.
- Timing construction in and around open water to occur, if possible, in late fall and winter when water levels are low, soil compaction is minimal, and vegetation is dormant.
- Fencing trees and shrubs to prevent damage and spare existing trees in impacted wetlands when possible.

Impacts to Other Waters of the US will be mitigated through the restoration of the original topography. Compensatory wetland mitigation will occur at a ratio of 1:1 as close to the site of impact as possible. Water rights issues will be considered during the final selection of mitigation sites.

Two methods of compensatory wetland mitigation are restoration of existing degraded wetlands and wetland creation. Wetland mitigation will occur within the riparian area adjacent to East Plum Creek in Castle Rock. Two potential additional wetland mitigation areas are Newlin Gulch located on I-25, and Spring Gulch located on US 85. These areas were chosen for their proximity to sites of impact and their favorable hydrological conditions for wetland creation.

Due to channel incision along East Plum Creek, the water table is no longer connected to the adjacent floodplain. Wetland mitigation is complicated along East Plum Creek by the presence of the federally threatened Preble's Meadow Jumping Mouse (PMJM). Wetland mitigation in this area will consist of a series of three 1.2-meter (4-foot) tall check dams. Currently, CDOT has committed to these three check dams. Additional dams may be constructed by CDOT in the future. These dams are designed to raise water levels in the surrounding floodplain thereby reconnecting hydrophytic vegetation with the water table. The check dams will be constructed of sheet piling and will extend into the adjacent floodplain terraces at, or just below, the ground surface to prevent failure of the check dams during flood events. Design features of the check dams include a low-flow notch and plunge pools just below each check dam, which are expected to improve aquatic habitat diversity along this reach of East Plum Creek.

The three check dams will be located at the newly constructed 5th Street Bridge, just below where the Town of Castle Rock sewer line crosses the stream, and another at a midpoint between these two fixed points. In addition to wetland restoration, the check dam at the Town of Castle Rock sewer line will help to protect the pipe from breakage during high-flow events. The total amount of wetland mitigation area achieved will be determined through the monitoring of 18 shallow groundwater wells. Wetland restoration in this area will be accomplished through the re-establishment of wetland hydrology and will consist of soil saturation within the top 0.3 meter (12

inches) of the soil surface for 18 consecutive days during the growing season (12.5 percent of the growing season).

Compensatory wetland mitigation may also occur at Newlin Gulch on I-25 and at Spring Gulch on US 85. Newlin Gulch was used for wetland mitigation for the Climbing Lanes Phase II Early-Action project. Opportunities for additional wetland mitigation exist there through the re-grading and expansion of existing wetland areas. Similarly, wetlands at Spring Gulch may be expanded by regrading existing sideslopes to permit saturation/inundation of adjacent areas.

Although not required by USACE, non-jurisdictional wetlands (temporary impacts) will be mitigated in the newly created ditches when possible, adjacent to the site of impact, by broadcast seeding these areas with a wetland seed mix specified by CDOT.

7.3.5 Geology

No geological impacts are anticipated as a result of the Preferred Alternative or the Other Alternative; therefore, mitigation is not required.

7.3.6 Wildlife

Habitat fragmentation and barriers to connectivity among areas of high quality wildlife habitat (i.e., conservation areas) are the primary wildlife concern. Because I-25 already poses a substantial barrier to wildlife movement, and several conservation areas exist on both sides of the US 85 Corridor (see Chapter 4.0, *Affected Environment*), wildlife habitat along US 85 is a higher priority than it is along I-25. Therefore, compensatory mitigation for habitat conversion will be most effective, and should occur, within the US 85 Corridor. Mitigation for lost habitat and permeability among habitats will be coordinated with the CDOW and will include:

- Providing mitigation for riparian habitat losses. Woody riparian vegetation will be mitigated at a replacement ratio of 1:1 where water requirements can be met for planting riparian vegetation. Mitigation will include enhancement and/or reclamation, and will consist of revegetation (i.e., cottonwood and willow plantings, snowberry, etc.) and reseeding with native grass and forb species specified by CDOT.

- CDOT will work with the Douglas County Open Space program to identify the protection, restoration, or enhancement of important habitat.

- Enlarging wildlife crossings at tracking stations 1 and 3 (MP 195.2 and MP 189.7) to accommodate deer and elk movement across US 85. These sites will also be enhanced with shrub plantings to facilitate wildlife movement.

- Enhancing shrub cover in other drainages (in addition to tracking stations 1 and 3) with existing structures used as wildlife crossing points to improve east-west connectivity in other areas along US 85.

- Maintaining existing hydraulic structures (i.e., concrete box culverts, bridges, etc.) where practical to facilitate movement of carnivores or mid-sized mammals, even if they are no longer needed for water movement.

- Installing fencing to funnel wildlife through selected wildlife crossings will be determined in consultation with the CDOW.

- Promoting the use of wildlife crossing structures through the use of native materials as substrate. Native substrate (i.e., coarse sand) should be used inside the wildlife crossing structures, and materials such as rip-rap should be avoided as possible at structure inlets and outlets where possible.

- Installing signage in areas of known wildlife crossings. Considering use of modern methods to reduce driver habituation to wildlife crossing signs. CDOT will consult with the CDOW as to the proper signage type and location.

- Resize and clean existing culverts along US 85 to allow for the potential movement of small wildlife.

- CDOT commits to ongoing dialogue with the appropriate agencies in respect to the dynamic nature of wildlife behavior and management. This dialogue will allow CDOT to more effectively tailor the broad commitments summarized herein to the actual field conditions.

CDOT will coordinate with the CDOW, Douglas County Open Space, and the Chatfield Basin Conservation Network during the design phase of the wildlife crossing enhancements at Tracking Stations 1 and 3 (MP 195.2 and MP 189.7) in order to determine if any additional wildlife crossing enhancements are needed.

Installing noise walls, retaining walls, jersey barriers, and curbs could create additional barriers to wildlife permeability. CDOT will consult with the CDOW, Douglas County Open Space, and the Chatfield Basin Conservation Network during design in areas of known wildlife movement.

7.3.7 Wild and Scenic Rivers

No wild and scenic rivers are within the I-25 Corridor and US 85 Corridor study area; therefore, mitigation is not required.

7.3.8 Floodplains

All practical measures to minimize harm to floodplains are incorporated in the Preferred Alternative and the Other Alternative for both the I-25 Corridor and the US 85 Corridor. Little to no change to historic drainage patterns is expected within, or downgradient from, the area of potential effect (APE). Impacts to the floodplain are minimized by following standard stream crossing design criteria, avoiding direct impacts on stream channels, and adjusting the alignment where possible. Bridge and roadway designs seek to minimize impacts to floodplains in compliance with Federal Highway Administration (FHWA) requirements, including efforts to span 100-year floodplains. Final designs will adhere to CDOT drainage criteria for both minor and major hydraulic structures, as well as following all Federal Emergency Management Agency (FEMA) requirements. The Selected Alternative, which will be defined in the ROD, will also avoid the longitudinal and significant encroachment in the floodplains.

Under the direction of CDOT, the implementation of BMPs identified in the ***Erosion Control and Stormwater Quality Guide,*** 1995, minimizes impacts to floodplains. Specific measures include the following:

- Coordinating with Douglas County and local governments concerning issues related to floodplain encroachment.

- Developing and implementing a SWMP for each project phase, which will contain measures preventing the inadvertent transport of noxious weeds into the construction site by heavy equipment and fill dirt.

- Installing detention basins, infiltration beds, or other structural controls to reduce and minimize the effects of increased runoff due to substantial increases in impervious surfaces (see Section 7.3.2, *Water Quality*).

- Grading and seeding incrementally to reduce soil loss during construction. Native grasses should be used in seed mixes. Native shrub seeds should be included in the seed mix where conflicts with maintenance will not occur.

- Using fast-growing non-native grass species in areas identified as having moderate to high erosion potential to minimize soil loss while slow-growing native species establish.

- Providing ditch and slope rounding to prevent unnecessary erosion.

- Excluding construction vehicles from entering wetland areas by installing temporary fencing.

- Diverting clean water runoff during construction.

- Identifying and using appropriate concrete washout areas well away from floodplains to ensure polluted water does not leave the site.

- Using soil stabilization practices (such as erosion control blankets and mulching impacted areas) to reduce erosion.

- Installing structural BMPs (such as silt fences and erosion bales downgradient from impacted areas) to reduce off-site siltation.

- Developing an emergency spill response program and implementing spill prevention practices (such as locating staging areas and fuel and hazardous construction material storage sites well away from floodplains) to reduce risks from accidental spillage and leaching.

- Fencing existing shrubs and trees to avoid damage. Replacing trees where maintenance and water requirements can be met.

- Managing noxious weeds is a serious concern and is discussed in Section 7.3.3, *Vegetation*.

7.3.9 Threatened, Endangered, and Other Special-Status Species

Threatened, endangered, and other special-status species are especially sensitive to impacts due to their low population densities, or minimal amounts of suitable habitat remaining to them. The PMJM and black-tailed

prairie dogs are two special-status species with habitat within the APE that will be directly impacted by the Preferred Alternative or Other Alternative. Mitigation of secondary impacts to aquatic habitat is described in Section 7.3.2, *Water Quality*.

Impact to PMJM habitat has been avoided or minimized where possible. The I-25 Corridor is realigned 14 meters (46 feet) to the east between Ligget Road and Wolfensberger Road to avoid impacts to PMJM habitat. Impacts to PMJM habitat are also minimized by widening I-25 to the inside, adjusting sideslopes to 3:1 and 2:1 grades instead of the typical 4:1 grades used on transportation projects, by minimizing construction zones and access roads, by scheduling construction in these areas during the hibernation period (October 15 to April 30), and by not permitting night-time work. Compensatory mitigation for the PMJM habitat will include:

- Restoring habitat that will be temporarily disturbed during construction (on-site restoration). General restoration measures will include in-kind replacement of disturbed vegetation and reconstruction of original slope contours where this would benefit restoration efforts.

- Restoring or enhancing habitat that has been degraded by non-project actions (i.e., check dams on East Plum Creek).

- Protecting habitat of off-site areas within Douglas County.

Due to channel incision along East Plum Creek, the water table in the adjacent floodplain has dropped dramatically over the past few years. PMJM habitat mitigation in this area will consist of a series of three 1.2-meter (4-foot) tall check dams. Currently, CDOT has committed to these three check dams. Additional dams may be constructed by CDOT in the future. The check dams are designed to reconnect the water table to the surrounding floodplain and riparian vegetation. The check dams will be constructed of sheet piling and will extend into the adjacent floodplain terraces at or just below the ground surface to prevent failure of the check dams during flood events. Design features of the check dams include a low flow notch and plunge pools just below each check dam, which are expected to improve aquatic habitat diversity along this reach of East Plum Creek. The three check dams will be located at the newly constructed 5th Street Bridge, just below where the Town of Castle Rock sewer line crosses the stream, and another at midpoint between these two fixed points. In addition to PMJM habitat enhancement, the check dam at the Town of Castle Rock sewer line will help protect the pipe from breakage during high-flow events.

The ***Preble's Meadow Jumping Mouse Biological Assessment for the South I-25 Corridor and US 85 Corridor Environmental Impact Statement,*** October 2000, contains more detailed information on PMJM mitigation.

Impacts to black-tailed prairie dog colonies were reduced along US 85 by minimizing ROW take along the entire alignment; this involved adjusting sideslopes and incorporating guardrails and retaining walls into the design. Compensatory mitigation for black-tailed prairie dog habitat conversion might include:

- Relocating black-tailed prairie dogs, where possible, to inactive colonies within the APE, or relocating a colony in accordance with Senate Bill 99-111 requirements.

- Purchasing or otherwise protecting (e.g. conservation easement) land, where possible, containing active black-tailed prairie dog colonies adjacent to undisturbed habitat. Protected black-tailed prairie dog habitats should be equal in size to habitat lost from the Preferred Alternative or Other Alternative.

- Contributing financially or in-kind services for the preservation of black-tailed prairie dog habitat equal in size to habitat lost from the Selected Alternative. Work with Douglas County Open Space, Chatfield Basin Conservation Network, and CDOW to identify key parcels for protection.

- Black-tailed prairie dogs may be turned over to the United States Fish and Wildlife Service (USFWS).

Prior to construction, the USFWS and the CDOW will review the final mitigation measures for species under their respective jurisdictions. Final mitigation measures may include additional information on timing of construction activities, steeper sideslopes, or other means of reducing impacts.

7.3.10 Historic Resources

This section considers mitigation for Historic Resources impacted by the Preferred Alternative and the Other Alternative along the I-25 Corridor and the US 85 Corridor.

D&RG Railroad (5DA921.1)

The segment of the D&RG Railroad impacted by the project will be recorded prior to the beginning of construction on the I-25 Corridor, and prior to the demolition of the property so that there will be a permanent record of its present appearance in history. Recordation shall consist of Level II documentation as determined in consultation with the State Historic Preservation Officer (SHPO). All documentation must be accepted by the SHPO prior to the start of construction. Copies of documentation will be provided to the SHPO and to a local archive designated by the SHPO. Information will include historic research and documentation and archivally stable photographs of the property.

Cherokee Ranch Historic District (5DA708)

The historic gate and segment of Rattlesnake Road impacted by the project will be recorded prior to the beginning of construction on the US 85 Corridor, and prior to the demolition or displacement of the properties so that there will be a permanent historic record of their present appearance. Recordation shall consist of Level II documentation as determined in consultation with the SHPO. All documentation must be accepted by the SHPO prior to the start of construction. Copies of the documentation will be provided to the SHPO, the Cherokee Ranch and Castle Foundation, and to a local archive designated by the SHPO. Information will include historic research and documentation and archivally stable photographs of the property.

Once the above-mentioned documentation is complete, the original Main Gate to Cherokee Ranch will be moved to a new location on Rattlesnake Road. The final location of the gate will be determined through consultation with the Cherokee Ranch and Castle Foundation Board of Directors, and the SHPO.

7.3.11 Section 4(f) Properties

A discussion of mitigation measures for impacts to Section 4(f) properties is included in Chapter 6.0, *Section 4(f) Properties Evaluation*. These measures will be adopted by the FHWA with the completion of the South I-25

Corridor and US 85 Corridor ROD.

7.3.12 Archaeological Resources

When a Selected Alternative alignment for the South I-25 Corridor and US 85 Corridor ROD is developed, the CDOT staff archaeologist will compare it to previously studied alternative alignments. If any inconsistencies occur between the previous alternative alignment and the Selected Alternative alignment to be constructed, on-the-ground reconnaissance will be conducted as necessary to document that the Selected Alternative alignment has been adequately evaluated and that no archaeological resources determined to be significant by the SHPO will be adversely affected. Should any evidence of archaeological resources be discovered during construction, work in that vicinity will be stopped until the CDOT staff archaeologist can completely evaluate the significance of the finding according to criteria established for the National Register of Historic Places.

7.3.13 Paleontological Resources

Construction of the Preferred Alternative or Other Alternative may adversely affect, by burial, the presently known areal extent of fossil locality DMNS 1200, but all reasonable and prudent efforts will be made to avoid such adverse effects. Construction of the Preferred Alternative or Other Alternative will adversely affect, by construction excavation, previously unexamined, but potentially fossiliferous areas immediately lateral to and stratigraphically above the known areal extent of the locality. Prior to construction of the Preferred Alternative or Other Alternative, test excavation(s) will be conducted to determine, as accurately as possible, the horizontal and vertical extent of DMNS 1200 within the boundaries of the Preferred Alternative or Other Alternative.

Test excavation(s) will also be conducted in CDOT rights-of-way in areas adjacent to the known lateral extent of DMNS 1200, but outside of the proposed impact area of the Preferred Alternative and Other Alternative, in an effort to designate an alternate location(s) for continued future scientific study of the DMNS 1200 paleoflora. Adverse effects to those portions of the site that will be destroyed by construction excavation proposed as part of the Preferred Alternative and Other Alternative will be mitigated by salvage excavation prior to construction of the Preferred Alternative or Other Alternative.

Construction of the Preferred Alternative and Other Alternative will adversely affect fossil locality UCM 92164. Adverse effects will be mitigated by salvage excavation of a statistically valid representative sample of the preserved paleoflora prior to construction of the Preferred Alternative or Other Alternative.

Once design plans for any and all future construction projects permitted by the approval of this EIS are finalized, the CDOT staff paleontologist will examine them to estimate the required scope of construction monitoring work, if any. A special note requiring a paleontological monitor during construction (similar to those attached to the standard specifications for past projects requiring paleontological monitoring during construction) will be attached to the specifications for any future construction project(s) permitted by the approval of this EIS for which final design plans indicate the likelihood of affect to Denver Formation subsurface outcrop.

If any paleontological resources are uncovered along the alignment corridor during construction, work in the immediate vicinity will cease. The CDOT staff paleontologist will be notified, and the material will be evaluated by a qualified paleontologist and coordinated with the SHPO.

7.3.14 Prime and Unique Farmland

Prime and unique farmland does not exist within the APE. Statewide important farmland soil does exist. By minimizing sideslope grades, impacts to these areas of High Potential Dry Cropland along US 85 have been minimized by the Preferred Alternative and the Other Alternative. Increased farmland fragmentation along US 85 will be avoided by maintaining existing underpasses used by farm machinery. The prevention and elimination of noxious weeds is discussed in Section 7.3.3, *Vegetation*.

7.3.15 Noise

Noise abatement in the form of noise walls and earthen berms was evaluated along the I-25 Corridor and US 85 Corridor. Section 5.3.3.14, *Noise Impacts* presents the mitigation types, locations, and effectiveness for the receivers at or approaching the noise level abatement criteria (66 dBA for residences and 71 dBA for commercial businesses). One noise barrier is recommended and will be re-evaluated during final design.

7.3.16 Visual Character

In addition to the effort to minimize roadway width, other measures will be taken to offset potential impacts and potentially enhance the visual quality of the corridor. Landscaping treatments using native grasses and slope flattening will be included in the plans. The roadway is designed to blend with the natural setting, conforming to the line and form of the adjacent terrain and natural setting.

7.3.17 Hazardous Waste Sites

Further evaluation of potential hazardous waste sites will continue prior to property acquisition (once a Selected Alternative is selected) and during preliminary highway design. The Selected Alternative will avoid potentially contaminated areas whenever practical. However, where avoidance is not feasible, further site investigation will be required and will be coordinated with the affected property owner. Necessary cleanup plans are coordinated with appropriate agencies and landowners.

The inclusion of environmental specifications in the construction bid package will address worker health and safety during construction and contractor requirements.

7.3.18 Energy

No energy impacts are anticipated as a result of the Preferred Alternative or the Other Alternative; therefore, mitigation is not required.

7.3.19 Temporary Construction

The following measures are recommended to mitigate temporary construction impacts:

- Working closely with all affected individuals and businesses through a public information program during the project development phase and continuing through construction.
- Encouraging contractors to schedule construction activities during daytime hours to minimize noise

impacts, in accordance with Douglas County and Town of Castle Rock noise ordinances. Discouraging weekend work, with the exception of activities best suited for off-peak hours.

- Controlling fugitive dust emissions to within acceptable levels. Contractors will be required to use dust suppression techniques (such as wetting) to prevent excessive releases of fugitive dust.

- Mitigating water quality impacts by adhering to the requirements of stormwater permits issued for the project, through the application of standard CDOT erosion control measures and through the implementation of BMPs (e.g. temporary berms, detention ponds, and settling ponds will be used to control runoff and protect water quality during construction).

- Using temporary erosion control measures during construction and requiring permanent revegetation in disturbed areas.

- Using straw or other mulching material to minimize soils erosion during construction.

- Handling unforeseen construction impacts by using a review process and BMPs.

7.3.20 Secondary Impacts

The potential indirect disruptive, or quality-of-life, impacts that may occur over the long term have been, or will be, considered during the zoning and comprehensive planning process of the local jurisdictions. As these projects come closer to being finalized, the county and communities will have additional opportunities to address specific quality-of-life concerns in the zoning process and site plan review.

7.3.21 Cumulative Impacts

Cumulative impacts are impacts on the environment resulting from the incremental impact of a project when added to other past, present, and reasonably foreseeable future actions (regardless of responsible agency or person).

Habitat restoration for the PMJM, as a result of non-project actions (other projects or cumulative actions), is mitigated by constructing check dams. The check dams will be installed on East Plum Creek. Other habitat restoration in Sellers Gulch, and a former upland grassland along East Plum Creek, are also under consideration as mitigation sites. It is anticipated that the check dams will promote the riparian vegetation that serves as PMJM habitat that has been degraded due to previous projects and could be further intensified by the proposed improvements.

CDOT-implemented mitigation measures will prevent the proposed projects from further contributing to the cumulative degradation of water quality in the Chatfield and Cherry Creek basins, reducing the potential cumulative impact. Proper implementation of construction BMPs and adherence to all applicable regulations will minimize impacts to water quality during the construction phase of the proposed projects. Cross culverts and other drainage structures will be appropriately sized to maintain hydrologic connections across the project corridors. Stormwater detention basins will improve water quality and maintain stormwater runoff to historic levels. Particulates and other contaminants will settle in stormwater detention basins.

The state will continue to work with local agencies that can influence growth and promote the benefits of controls that incorporate environmental protection into all planned development.