3.1 INTRODUCTION

This chapter describes the existing conditions within the project area, evaluates the impacts that are expected to occur as a result of constructing the alternatives, and identifies mitigation measures to minimize or eliminate negative impacts associated with the Preferred Alternative.

For the purpose of collecting and analyzing data, the project area of influence varies, depending on the resource being evaluated and the potential effect of the proposed development activities on that resource.

Information presented in this chapter is based on published and unpublished literature, maps, aerial photographs, contacts with agency representatives as well as other knowledgeable individuals and organizations, and field investigations.

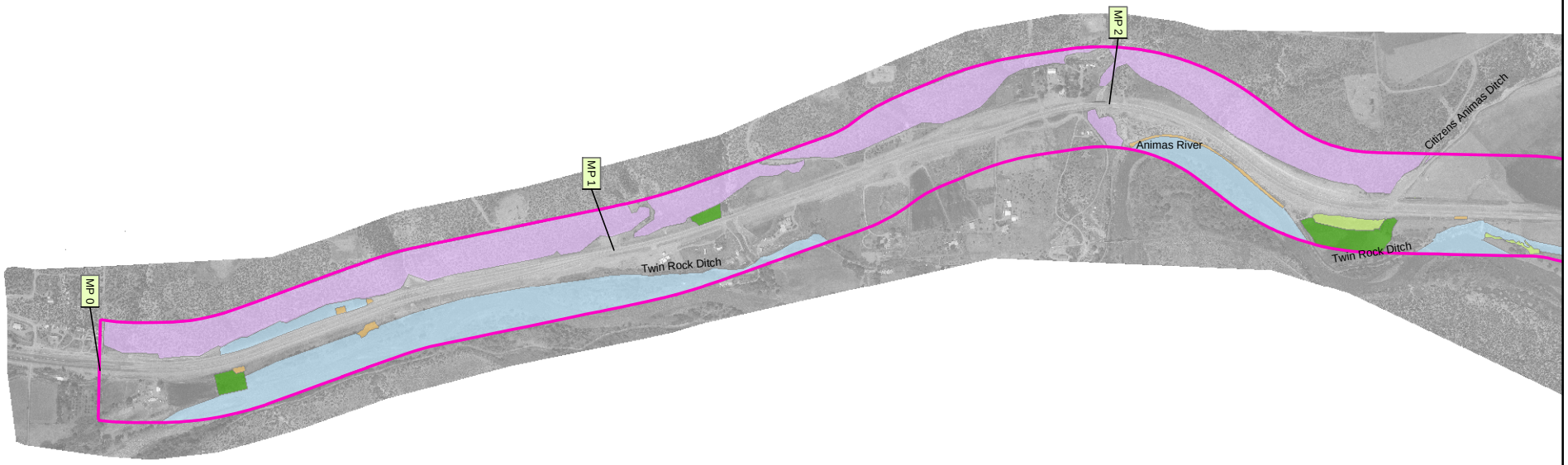
This chapter is organized by resource area, each containing four sections:

1. **Affected Environment** – In accordance with Council on Environmental Quality (CEQ) Regulations for Implementing the National Environmental Policy Act of 1969 (NEPA) (CEQ 1981), the affected environment sections for each resource describe the existing conditions of the human and natural environment that could be impacted, beneficially or adversely, by the proposed action alternatives. Baseline data were collected by reviewing existing documentation, consulting with various individuals and agencies, and conducting field reconnaissance for some of the resources.
2. **Environmental Impacts** – Each resource area introduced below includes a description of the basic impact assessment methodology and techniques used to determine the environmental consequences for that resource. Depending on the resource type, impacts are assessed quantitatively, qualitatively, or both. Resource impacts are described for each of the "action" alternatives and the "no action" alternative. Impacts may be beneficial or adverse and are evaluated based on their duration and degree in relation to the project.
3. **Mitigation Measures** – A description of the potential mitigation measures to avoid, reduce, or eliminate negative impacts.
4. **Residual Adverse Impacts** – A description of the residual impacts with mitigation fully implemented for the Preferred Alternative.

Included at the end of this chapter is a summary of impacts by resource area, and a summary of mitigation measures by resource area.

3.2 WILDLIFE

This section describes wildlife occurrence and distribution in the US Highway (US) 550 study area. The wildlife study area consists of a 500-foot-wide corridor from either side of the centerline of US 550, with expanded areas based on alternative alignment routes. A buffer area of 2,640 feet on either side of the US 550 centerline was evaluated for nesting raptors. Vegetation communities were mapped using aerial photographs and site visits. Wildlife habitats are shown in Figures 3.2-1 through 3.2-5.



\\S068NTFILE2\GIS\PROJECTS\US_550EA\MAPS\EA_FIG3-2-1_HABITAT_LTR.MXD

US 550

Legend

- Habitat Study Area
- **Habitat Type**
- Piñon-juniper Woodland
- Pond
- Riparian
- Sagebrush Shrubland
- Wetland
- Willow

1,000 500 0 1,000 2,000 Feet

DOT

US 550 EA

Wildlife Habitats from MP 0 to MP 2.9 Figure 3.2-1

02/04/05

To and From MP Distances Are Approximate

\\S068NTFILE2\GIS\PROJECTS\US_550EA\MAPS\EA_FIG3-2-1_HABITAT_LTR.MXD

US 550

Legend

- Habitat Study Area
- **Habitat Type**
- Piñon-juniper Woodland
- Pond
- Riparian
- Sagebrush Shrubland
- Wetland
- Willow

1,000 500 0 1,000 2,000 Feet

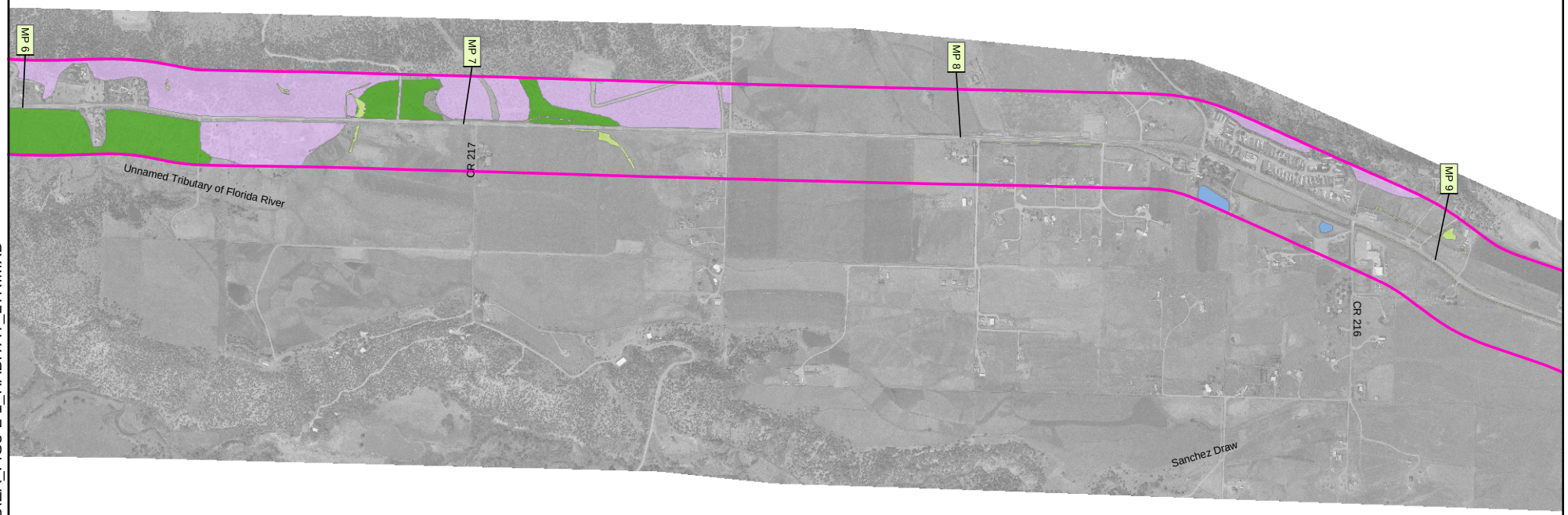
DOT

US 550 EA

Wildlife Habitats from MP 2.9 to MP 6.0 Figure 3.2-2

02/04/05

To and From MP Distances Are Approximate



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US 550

Legend

- Habitat Study Area
- **Habitat Type**
- Piñon-juniper Woodland
- Pond
- Riparian
- Sagebrush Shrubland
- Wetland
- Willow

1,000 500 0 1,000 2,000 Feet

DOT

US 550 EA

Wildlife Habitats from MP 6.0 to MP 9.3 Figure 3.2-3

02/04/05

To and From MP Distances Are Approximate

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US 550

Legend

- Habitat Study Area

Habitat Type

- Piñon-juniper Woodland
- Pond
- Riparian
- Sagebrush Shrubland
- Wetland
- Willow

1,000 500 0 1,000 2,000 Feet

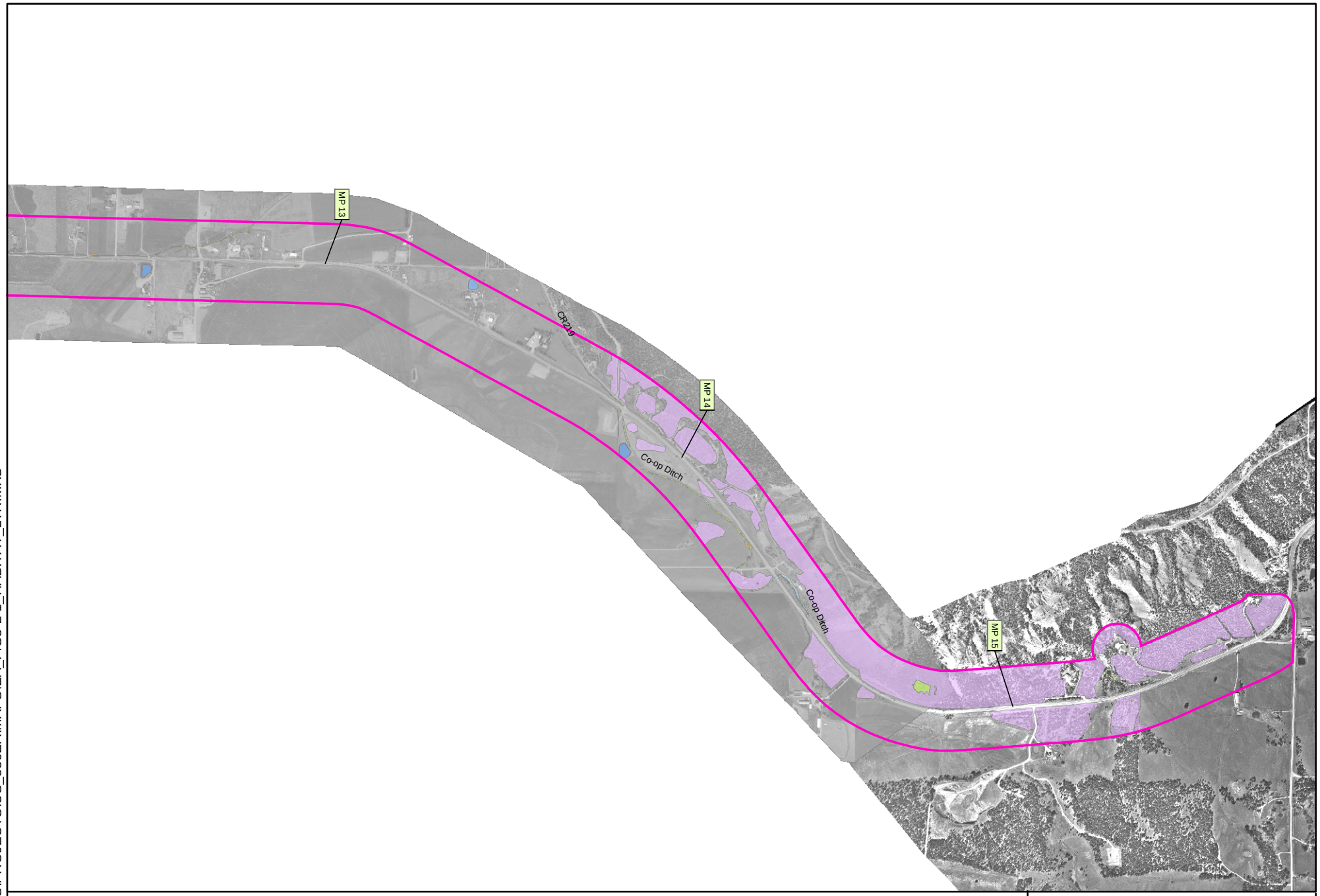
DOT

US 550 EA

Wildlife Habitats from MP 9.3 to MP 12.3 Figure 3.2-4

02/04/05

To and From MP Distances Are Approximate



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US 550

Legend

- Habitat Study Area

Habitat Type

- Piñon-juniper Woodland
- Pond
- Riparian
- Sagebrush Shrubland
- Wetland
- Willow

1,000 500 0 1,000 2,000 Feet

DOT

US 550 EA

Wildlife Habitats from MP 12.3 to MP 15.4 Figure 3.2-5

02/04/05

To and From MP Distances Are Approximate

3.2.1 Affected Environment

The vegetation communities occurring in the study area provide habitat for a variety of wildlife species including mammals, birds, reptiles, amphibians, and fish. Table 3.2-1 shows the major vegetation communities in the US 550 study area, as well as acres of each type and percentage of the total available land in the study area.

Table 3.2-1
Vegetation Communities in the US 550 Study Area

Vegetation Community	Acres	Percentage of Study Area
Piñon-pine/juniper woodland	585	40
Sagebrush shrubland	168	11
Riparian woodland and shrub	82	6
Wetlands	13	0.8

These vegetation communities are further described in Section 3.6, *Vegetation*. Other land cover in the study area include agricultural land (both active and fallow), pastureland, rural residential, commercial, and disturbed or developed.

Ungulates

Mule deer (*Odocoileus hemionus*) and elk (*Cervus elaphus*) are the only species of ungulates known to occur within the US 550 study area. Both mule deer and elk are economically important game species managed by the Colorado Division of Wildlife (CDOW). However, based on tracks, scat, and mortality records, mule deer are substantially more numerous in the study area.

Mule deer are widely distributed and occur in all natural habitats in Colorado. The species is migratory, spending summer at high elevations and winter at lower elevations. Mule deer migration ranges may be regional or local within a few miles; herds return to the same summer and winter range each year. CDOW considers the US 550 study area as mule deer summer range and severe winter range. Severe winter range is defined as "an area used for survival, which may or may not be considered a crucial range. These areas are used to a great extent only in extremely severe winters (i.e. 2 years out of 10)" (Fitzgerald et al. 1994).

According to a 2003 post-hunt count of 23,300 individuals in the San Juan deer herd, which inhabits the eastern side of US 550, the herd has slowly increased since 1992 (CDOW 2003). This slow increase is due to population management and low recruitment rates (additions through birth) (CDOW 2003). Recent drought conditions, as well as high fawn mortality and low fawning, have slowed the rate of increase. The population objective for the San Juan herd is 23,500 with potential increase to 27,000 in the future (CDOW 2001).

Carnivores

Carnivores known or likely to inhabit the study area include black bear (*Ursus americanus*), mountain lion (*Felis concolor*), bobcat (*Lynx rufus*), coyote (*Canis latrans*),

gray fox (*Urocyon cinereoargenteus*), ringtail cat (*Bassariscus astutus*), spotted skunk (*spilogale gacilis*), long-tailed weasel (*Mustela frenata nevadensis*), and raccoon (*Procyon lotor*).

Black bears inhabit montane shrubland and subalpine forests, but also frequent areas with gambel oak to take advantage of acorn production. While the study area is within black bear range, it is not considered a summer or winter activity area (Natural Diversity Information Source [NDIS] 2003). Optimal black bear habitat is north of the study area, but black bears may occasionally forage within the project corridor in piñon-juniper-oak-dominated habitats during years of abundant acorn production.

Mountain lions and bobcats inhabit most habitats in Colorado but prefer rocky, broken areas of piñon-juniper woodlands and montane forests, and tend to avoid open grasslands and agricultural areas. Bobcat tracks were observed in the study area during 1997 surveys (Dames & Moore 1997).

Coyotes occur in all habitats in Colorado and are opportunistic hunters. In areas of human settlement, coyotes prefer rough country with adequate cover and a food supply of rabbits and rodents. In Colorado, raccoons are most common along riparian corridors and are extremely adapted to human settlement. Long-tailed weasels utilize all habitat types with abundant prey such as deer mice, chipmunks, pocket gophers, prairie dogs, rabbits, birds, and reptiles (Fitzgerald et al. 1994). Gray foxes, ringtail cats, and spotted skunks are associated with rocky terrain of piñon-juniper woodlands, as well as semidesert and montane shrublands. In addition, gray foxes also inhabit unused edges of agricultural areas (Fitzgerald et al. 1994).

Small Mammals

Numerous small mammals are known or likely to inhabit the study area, including bats, rodents, lagomorphs (montane cottontail rabbits [*Sylvilagus nuttallii*] and black-tailed jackrabbits [*Lepus californicus*]), and shrews. Small mammals are important to the ecosystem in providing a prey base for other wildlife and dispersing seeds. Many species of bats inhabit the study area seasonally and/or during migration. Sensitive bat species are discussed in Section 3.4, *Threatened, Endangered, and Sensitive Species*. Table 3.2-2 lists rodent species known or likely to occur in the study area.

Table 3.2-2
Rodents Known or Likely to Occur in the US 550 Study Area

Species	Scientific Name	Species	Scientific Name
Deer mouse	*Peromyscus maniculatus*	Plains pocket mouse	*Perognathus flavescens*
Piñon mouse	*Peromyscus truei*	Western harvest mouse	*Reithrodontomys megalotis*
Brush mouse	*Peromyscus boylii*	White-throated woodrat	*Neotoma albigula*
Gunnison's prairie dog	*Cynomys gunnisoni*	Bushy-tailed woodrat	*Neotoma cinerea*
Botta's pocket gopher	*Thomomys bottae*	Mexican woodrat	*Neotoma mexicana*
Plains pocket gopher	*Thomomys talpoides*	House mouse	*Mus musculus*
Least chipmunk	*Tamias minimus*	Western jumping mouse	*Zapus princes*
Colorado chipmunk	*Tamias quadrivittatus*	Common muskrat	*Ondatra zibethicus*

Species	Scientific Name
Golden-mantled ground squirrel	*Spermophilus lateralis*
Rock squirrel	*Spermophilus variegatus*
Common porcupine	*Erethizon dorsatum*

Source: Fitzgerald et al. 1994

Birds

Birds present in the study area include a variety of species of raptors, passerines (migratory songbirds), and waterfowl.

Raptors

The riparian cottonwood stands and piñon-juniper woodland in the study area provide suitable nesting habitat for several raptor species. Additionally, wintering raptors may roost in mature trees in piñon-juniper and riparian habitats. Cliff areas adjacent to, but outside of the study area, support nesting golden eagles (*Aquila chryaetos*) and peregrine falcons (*Falco peregrinus anatum*). Several other species of raptors may inhabit the study area as summer, migratory, and/or winter residents. These species are presented in Table 3.2-3.

Table 3.2-3
Raptors Known or Likely to Occur in the US 550 Study Area

Species	Scientific Name	Species	Scientific Name
Northern harrier	*Circus cyanus*	Northern goshawk	*Accipiter gentilis*
Golden eagle	*Aquila chryaetos*	Cooper's hawk	*Accipiter cooperii*
Red-tailed hawk	*Buteo jamaicensis*	American kestrel	*Falco sparverius*
Ferruginous hawk	*Buteo regalis*	Sharp-shinned hawk	*Accipiter striatus*

Source: Andrews and Righter 1992

Bald eagles, peregrine falcons, northern harriers, and ferruginous hawks are discussed further in Section 3.4, *Threatened, Endangered, and Sensitive Species*.

CDOW recommends seasonal buffer zones from active raptor nests in Colorado (Craig 2001). For this reason, the Colorado Department of Transportation (CDOT) conducted raptor nest surveys to determine locations of nests within recommended buffer zones from the US 550 study area. During an aerial raptor nest survey conducted on June 21, 2004, CDOT identified several red-tailed hawk, prairie falcon, golden eagle, and great-horned owl nests (CDOT 2004). However, only three nests were located within recommended seasonal buffers. A red-tailed hawk nest is located within 1/3-mile of the project study area; and one prairie falcon nest and one golden eagle nest are located approximately 1/2-mile from the project study area. Additional nests (i.e. American kestrel and great-horned owl), which may not be visible due to dense foliage, are likely located in the cottonwood stands along the Animas River.

Passerines (Migratory Songbirds)

Numerous passerine (songbird) species may utilize the study area for nesting, migration, and/or wintering. The highest species diversity occurs in riparian habitats, such as the

Animas River and other drainages crossing US 550. In the vegetation communities within the study area, piñon-juniper woodlands support a greater diversity of migratory songbirds than sagebrush areas, due to the varied structure of the canopy and understory. Based on literature reviews of habitat associations and known ranges, the species listed in Table 3.2-4 may nest or winter in the study area.

Table 3.2-4
Common Year-Round Bird Residents in the US 550 Study Area

Common Name	Scientific Name	Common Name	Scientific Name
Mourning dove	*Zenaida macroura*	Violet-green swallow	*Tachycineta thalassina*
Lewis's woodpecker	*Melanerpes lewis*	Juniper titmouse	*Baeolophus griseus*
Downy woodpecker	*Picoides pubescens*	Mountain chickadee	*Parus gambeli*
Hairy woodpecker	*Picoides villosus*	Nuthatches	*Sitta* sp.
Northern flicker	*Colaptes auratus*	Bushtit	*Psaltriparus minimus*
Western wood-pewee	*Contopus sordidulus*	Blue grosbeak	*Guiraca caerulea*
Western kingbird	*Tyrannus verticalus*	Black-headed grosbeak	*Pheucticus melanocephalus*
Western scrub-jay	*Aphelocoma californica*	Western bluebird	*Sialia mexicana*
Pinyon jay	*Gymnoorhinus cyanocephalus*	Mountain bluebird	*Sialia currucoides*
Black-billed magpie	*Pica pica*	Song sparrow	*Melospiza melodia*
American crow	*Corvus brachyrhynchos*	Western meadowlark	*Sturnella neglecta*
Common raven	*Corvus corvax*	House finch	*Carpodacus mexicanus*
Cliff swallow	*Petrochelidon pyrrhonata*	American robin	*Turdus migratorius*
Barn swallow	*Hirundo rustica*	Red-winged blackbird	*Xanthocephalus xanthocephalus*

Source: Andrews and Righter 1992; Kingery 1998, NDIS 2003

The species listed in Table 3.2-5 are birds that nest in the study area during the summer and migrate elsewhere in the winter.

Table 3.2-5
Common Summer Birds in the US 550 Study Area

Common Name	Scientific Name
Killdeer	*Charadrius vociferous*
Belted kingfisher	*Ceryle alcyon*
Say's phoebe	*Sayornis saya*
Rock wren	*Catherpes mexicanus*
Bewick's wren	*Thryomanes bewickii*
Blue-gray gnatcatcher	*Polioptila caerulea*
Chipping sparrow	*Spizella passerina*
Lark sparrow	*Chondestes grammacus*
Bullock's oriole	*Icterus bullockii*

Source: Andrews and Righter 1992; Kingery 1998

Waterfowl

Ducks and geese utilize riparian habitats such as the Animas River, wetlands, irrigation ditches, and stock ponds in the study area. Species observed or likely to inhabit the US 550 study area, especially in summer are shown in Table 3.2-6

Table 3.2-6
Waterfowl Observed or Likely to Inhabit the US 550 Study Area

Common Name	Scientific Name
Mallard	*Anas platyrhynchos*
Northern pintail	*Anas acuta*
Blue-winged teal	*Anas querquedela*
Cinnamon teal	*Anas cyanoptera*
Northern shoveler	*Anas clypeata*
Gadwall	*Anas strepera*
American wigeon	*Anas americana*
Canada goose	*Branta canadensis*

Source: Andrews and Righter 1992; Kingery 1998

Reptiles and Amphibians

Moist environments, such as wetlands, riparian areas, and irrigation ditches within the study area, provide suitable habitat for amphibians. Amphibians expected to inhabit the study area are shown in Table 3.2-7. Northern leopard frogs are discussed further in Section 3.4, *Threatened, Endangered, and Sensitive Species.*

Table 3.2-7
Amphibians Known or Likely to Occur in US 550 Study Area

Species	Scientific Name	Habitat
Bullfrog	*Rana catesbeiana*	Riparian and ponds; non-native
Northern leopard frog	*Rana pipiens*	Riparian
Tiger salamander	*Ambystoma tigrinum*	Riparian
Western chorus frog	*Pseudacris triseriata*	Riparian areas in ponds
Woodhouse's toad	*Bufo woodhousii*	River valleys, floodplains, and irrigated agricultural fields
New Mexico spadefoot	*Spea multiplicata*	Upland sagebrush and semidesert shrubland, as well as floodplains of streams

Source: Hammerson 1999; NDIS 2003

The majority of reptile species inhabiting the study area primarily occur in piñon-juniper woodland. However, reptiles, especially snakes, may occupy a number of different habitat types. The species listed in Table 3.2-8 may occur in the US 550 study area based on known habitat requirements and distributions.

Table 3.2-8
Reptiles Potentially Occurring in the US 550 Study Area

Common Name	Scientific Name
Painted turtle	*Chrysemys picta*
Short-horned lizard	*Phrynosoma hernandesi*
Side-blotched lizard	*Uta stansburiana*
Sagebrush lizard	*Sceloporus graciosus*
Prairie/plateau lizard	*Sceloporus undulatus*
Western whiptail	*Cnemidophorus tigris*
Plateau striped whiptail	*Cnemidophorus velox*
Variable skink	*Eumeces gaigeae*
Racer	*Coluber constrictor*
Milk snake	*Lampropeltis triangulum*
Smooth green snake	*Liochlorophis vernalis*
Bullsnake	*Pituophis catenifer*
Western terrestrial garter snake	*Thamnophis elegans*
Western rattlesnake	*Crotalus viridus*

Source: Hammerson 1999

Fish

The Animas River intersects US 550 at approximately milepost (MP) 3.75. Additionally, the Florida River, a tributary of the Animas River, flows adjacent to and east of US 550. These rivers support limited fisheries and fish spawning. Based on known distributions of fish species in the study area, the fish species shown in Table 3.2-9 may occur in the Florida and Animas rivers. In surveys conducted in the early 1990s, CDOW collected roundtail chub from the Florida River at Bondad Hill (Japhet 2003a). Smaller drainages and seasonal tributaries, such as Deer Creek, may support fathead minnow, speckled dace, and roundtail chub (Sugnet 2003b).

Table 3.2-9
Fish Species in the US 550 Study Area

Species	Scientific Name
Bluehead sucker	*Catostomus discobolus*
Brown trout	*Salmo trutta*
Common carp	*Cyprinus carpio*
Fathead minnow	*Pimephales promelas*
Flannelmouth sucker	*Catostomus latipinnis*
Green sunfish	*Lepomis cyanellus*
Rainbow trout	*Oncorhynchus mykiss*
Roundtail chub	*Fila robusta*
Sculpin	*Cottus*
Speckled dace	*Rhinichthys osculus*
White sucker	*Catostomus commersoni*

Source: Sugnet 2003a, 2003b

3.2.2 Environmental Consequences

Impacts Specific to No Action

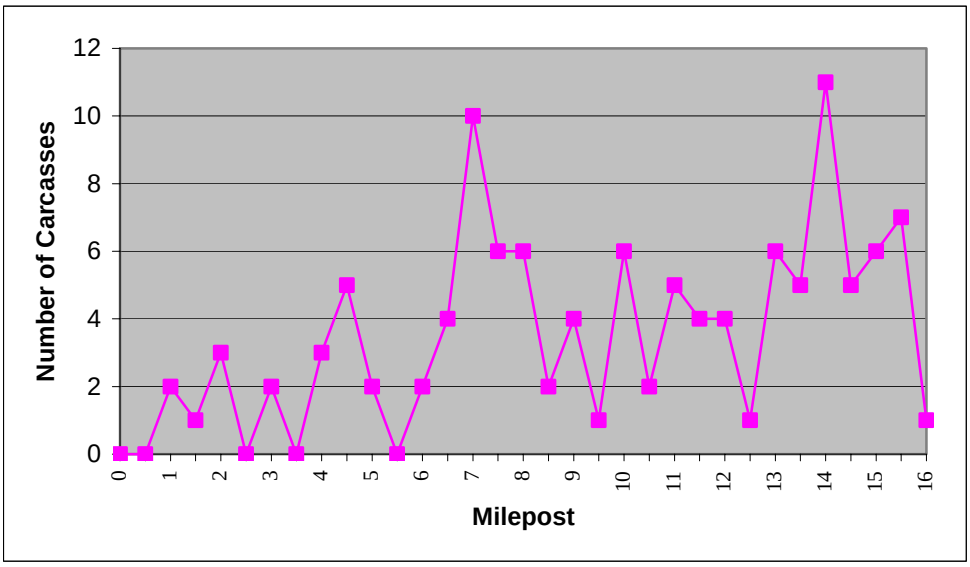
Highways generally have impacts to terrestrial and aquatic habitats through habitat fragmentation, direct and indirect habitat loss, temporary disturbance, and mortality (Ruediger 1996, 1998). All animals are vulnerable to mortality as a result of vehicle collision, including insects, amphibians, reptiles, birds, and mammals. However, the larger-bodied species, such as deer, can also cause vehicular damage and injury or death to humans when struck by a vehicle.

The No Action Alternative would result in continued direct and indirect impacts to wildlife within the study area. The presence of the highway and other developments in the study area indirectly affect wildlife through habitat fragmentation and displacement. While future land use within the US 550 corridor is expected to stay rural in character, additional residential and commercial development is likely to occur, especially at Bondad Hill, resulting in a loss of open space for wildlife habitat. Future development in and around the City of Durango and in New Mexico would increase traffic on US 550, which would result in an increase in the frequency of wildlife collisions within the study area under the No Action Alternative.

Because of their migratory pattern, which utilizes the severe winter and summer range areas on both sides of US 550, deer would continue to cross US 550 and suffer vehicle-related mortality and injuries, resulting in continued impacts to mule deer populations in the area. The lack of suitable wildlife crossings and deer fencing along US 550 would contribute to the high numbers of mule deer killed by vehicles on the highway. Vehicle collisions with deer result in death to the animals in 92 percent of the accidents (Scheick and Jones, no date). Between 2000 and 2002, the Colorado State Patrol (CSP) reported at least 46 deer collisions on US 550 within the study area, causing injuries to drivers and passengers, and one motorcycle fatality. CDOT recorded an additional 85 mule deer mortalities from vehicle collisions within the study area between March 18, 2002 and November 4, 2003. No vehicular collisions with elk have been reported within the study area (Sugnet 2003a).

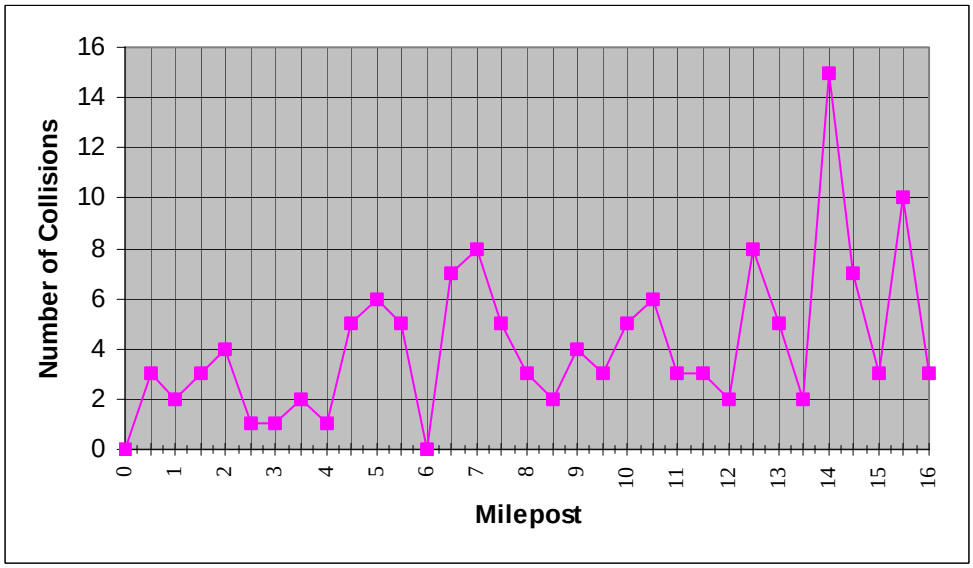
Analysis of CSP accident reports collected between 1986 and 2002 and CDOT road maintenance records of roadkilled deer carcasses found along US 550 between 2002 and 2003 indicate specific locations of high frequency mule deer crossing on US 550 (Figure 3.2-6). Vehicle collisions with deer were most frequent at MP 14 (Figure 3.2-7). The highest frequency of vehicle collisions with deer was between fall and early spring (e.g., August through March) due to the migration patterns of mule deer from higher elevations during the summer to lower elevations during the winter and spring (Sugnet 2003a).

Figure 3.2-6
Mule Deer Carcasses along US 550 by Milepost* (2002-2003)



**Points indicate location of collision at and between mileposts; location of carcass was rounded to nearest ½-mile.*
Source: CDOT Maintenance Records March 2002 through September 2004.

Figure 3.2-7
Mule Deer Collisions along US 550 by Milepost* (1986-2002)



**Points indicate location of collision at and between mileposts; location of accident was rounded to nearest ½-mile.*
Source: CSP Accident Data 1986-2002.

Milepost 0.0 to 3.0

Habitats occurring in this segment include piñon-juniper woodland, sagebrush, riparian, wetland, disturbed/developed, and agricultural communities. Large box culvert wildlife crossings (8' high x 24' wide) installed during previous construction activities (State Line North Project) are located at MPs 0.37 and 0.6. Other drainages with suspended sections of highway are located at MP 1.0 and approximately MP 1.6. Tracks observed during November 2003 field visits indicate these crossings are used by a variety of wildlife.

Milepost 3.1 to 6.5

This segment contains a variety of vegetation communities; however, no signs of game were observed in areas outside of the Deer Creek and Animas River drainages, corresponding to approximately MPs 3.0 to 4.0. The Animas River (approximately MP 3.75) is a primary movement corridor for wildlife moving across US 550 as indicated by presence of scat and game trails (Sugnet 2003a). The low number of collisions/mortalities reported between MP 3.1 to 4.0 supports the conclusion that the bridge over the Animas River allows multiple species to cross US 550 effectively. This bridge has four 20-foot wide piers, of which two are located in the river, and can be considered an obstacle to wildlife movement in the water. However, the presence of this bridge allows for wildlife to move under the highway along a corridor of natural vegetation.

Sagebrush scrub, piñon-juniper woodland, and agricultural land dominate the study area adjacent to MPs 4.0 to 6.5. Considerable amounts of mule deer scat, tracks, and hair were observed in the piñon-juniper habitat in areas adjacent to MPs 5.0 to 7.0 (Sugnet 2003a). The area east of US 550 between MPs 3.1 and 6.5 accounted for 16.5 percent of collisions (Figure 3.2-7) and is considered to be an important movement corridor for mule deer, especially between MPs 4.5 and MP 5.0 (CSP 2002).

Milepost 6.6 to 10.3

Numerous wildlife collisions were reported in this segment of highway. The majority of accidents occurred at MP 7.0 and MP 10.0, and 27 percent of reported accidents involving deer occurred in this segment (CSP 2002). The area between MPs 7.0 and 8.0 is primarily agricultural to the east and piñon-juniper woodland to the west. MP 10.0 is surrounded by agricultural land, including pasture and developed areas. Mule deer use of the agricultural areas is likely highest during late fall, winter, and early spring months. During these time periods, mule deer may often be observed grazing on remnant or early season grassy agricultural areas due to the decreased amounts of browse forage available at higher elevations during these times of year (Sugnet 2003a).

Milepost 10.4 to 15.4

This stretch reported the highest percentage of collisions: 46.6 percent (CSP 2002). Areas adjacent to MPs 10.4 to 15.4 consist of agricultural land, rural residential areas, and piñon-juniper woodland. The majority of collisions occurred at MP 14.0. During field visits, numerous deer and deer signs were observed within the piñon-juniper habitat located directly west of US 550, from MPs 14.0 to 15.4. This segment is considered to

be an important deer movement corridor with good cover on the west side of US 550 and good access downhill to the Animas River (Sugnet 2003a). On the east side of US 550 in this segment, piñon-juniper woodland occurs only in patches within the agricultural fields.

Impacts Common to all Action Alternatives

Direct impacts to wildlife as a result of the US 550 highway improvements would include habitat loss, temporary displacement during construction activities, and mortality to small and burrowing animals from crushing during earthmoving activities.

Impacts from Habitat Loss

Habitat loss would occur from land clearing in the right-of-way (ROW). The amount of habitat loss differs for each alternative as outlined below, but the qualitative impact is the same. Habitat loss has a direct impact on wildlife by reducing foraging habitat and cover. An indirect impact of habitat loss is the displacement of animals and the long-term reductions in local populations as animals adjust to the loss of habitat. The habitat loss would be small on a regional scale, but would contribute to incremental cumulative losses from other development activities in the region.

Impacts from Construction

Construction activities, such as human presence, noise, and heavy equipment disturbance, have a direct effect on wildlife and would temporarily displace or stress wildlife species during construction, resulting in alteration of normal behavior patterns such as breeding and foraging. For larger, mobile species, construction may result in displacement to adjacent areas of similar habitat. The distance and duration an animal is required to move depends on species, topography, and vegetative cover. Construction activities, especially initial clearing and earth moving, would have a direct impact on smaller, less mobile, and burrowing animals such as reptiles and rodents, by crushing or burial, as they are less able or unlikely to move away from disturbance. Direct disturbance of native habitat may impact nesting birds through nest destruction, loss of nesting habitat, and/or nest abandonment, depending on the season of construction. Protection of nesting avian species is provided under the Migratory Bird Treaty Act (MBTA).

Impacts from Construction of the Animas River Bridge

The Animas River Bridge would be widened and lengthened under all of the alternatives. The new design would consist of two 5-foot-wide piers that would be located out of the riverbed. As the existing bridge and piers are removed, aquatic wildlife would incur temporary and short-term direct impacts from construction activity and heavy equipment operation. More sensitive animal species may avoid this area during construction, but this is not expected to result in long-term or indirect impacts to species or populations.

All action alternatives may have temporary direct impacts to the aquatic species in the Animas River during bridge reconstruction, including short-term interruptions in flow and an increase in sedimentation, total suspended solids (TSS), and total dissolved solids (TDS). However, once the bridge is completed, the conditions should return to current levels.

Impacts from the Road

Vehicle collisions result in localized short- and long-term direct and indirect impacts to animal populations. Widening US 550 from two to four lanes and increasing the design speed would result in faster vehicle speed, which generally correlate with an increase in collisions with animals. Increases in the width and design speed of the roadway, when combined with the anticipated growth-induced increases in traffic volume, would create a more substantial barrier to animal movements across the highway that, if left unmitigated, may result in isolated animal populations and local extirpations (Forman 2000). Roads create gaps in habitat connectivity that results in fragmentation because crossing becomes more difficult for animals as traffic volumes and speeds increase. As populations become isolated, local extinctions are likely to eventually occur due to predation, inbreeding, and disease.

While US 550 does not block a major migration corridor, several areas, including MPs 6.5 to 8, MPs 10 to 11, MP 13, and MPs 14 to 15.4, are used heavily by deer, as indicated by the high number of individuals killed by vehicle collisions in these areas. Without some sort of mitigation, widening the highway would create a bigger obstacle for deer to cross and more time would be spent on the road while crossing over, increasing the chance of a deer getting hit by a vehicle. Well-planned and well-designed wildlife crossing structures substantially reduce negative impacts that roads cause to deer and other wildlife. The incorporation of four large (minimum 8' high x 24' wide) wildlife crossing structures and deer fencing on US 550, as described in Section 2.3.2.1, *Design Features Common to All Action Alternatives*, would provide deer and other wildlife a safe passage to cross under the highway.

The addition of wildlife crossing structures and deer fencing along the ROW would reduce vehicle-related impacts to large and medium-sized wildlife species substantially. Animal populations would be able to disperse to new territory and interact with other individuals and populations, resulting in an increase in genetic diversity, which is important for long-term species survivorship. Smaller species, such as gray fox, that are capable of slipping through the deer fencing would continue to be killed on US 550, but these species would also benefit from the wildlife crossing structures.

As described in Section 2.3.2.1, *Design Features Common to All Action Alternatives*, large multi-species wildlife crossing structures would be constructed at MPs 4.85, 6.75, 13.90, and 15.05. Additionally, deer fencing would be erected along the US 550 corridor, and deer guards would be installed at all intersections and driveways to prevent deer from entering the ROW in these locations. Many wildlife species, including mule deer, would benefit from CDOT's commitment to incorporate wildlife crossings and fencing along the US 550 corridor. From successful results in other projects, it is estimated that incorporation of the four large multi-species crossing structures and deer fencing into the US 550 project would reduce vehicle-collisions with deer 60 to 97 percent (Knapp et. al. 2004).

Impacts Specific to Alternative 1

Under Alternative 1, 55 acres of natural habitat would be removed in the US 550 ROW for project construction. This would include approximately 29.3 acres of piñon-juniper

woodland, 20.9 acres of sagebrush shrubland, approximately 2.7 acres of wetland, and 2.1 acres of riparian habitat, for a total of 55 acres. The areas of greatest habitat disturbance would occur between MPs 3.1 and 6.6 in the vicinity of Bondad Hill, where approximately 27 acres of piñon-juniper woodland and nearly 21 acres of sagebrush shrub would be removed to expand the ROW from two to four lanes.

Alternative 1 closely follows the existing highway and would not have additional habitat fragmentation impacts at Bondad Hill.

Impacts Specific to Alternative 2 (Preferred Alternative)

Alternative 2 follows the same alignment as Alternative 1, except between MPs 3.1 and 6.6 where the alignment shifts slightly to the east. Alternative 2 would have 2.2 acres more impact on piñon-juniper woodland (31.5 acres), more impacts to sagebrush (23.5 acres), 0.04 acre more impact to riparian habitat (2.14 acres), and the same impact to wetlands (2.7 acres) as compared to Alternative 1, for a total impact of 60 acres of natural habitat. Approximately 6,800 linear feet of roadway would be relocated at Bondad Hill. This relocated area under Alternative 2 would be less than 200 feet from the existing roadway and would be reclaimed and revegetated with appropriate plant species, thus replacing some disturbed habitat over an extended period of time.

Impacts Specific to Alternative 3

Alternative 3 follows the same alignment as Alternative 1, except between MPs 3.1 and 6.6 where the alignment shifts to the east of Bondad Hill. Implementing Alternative 3 would result a total of 77.8 acres of impact to native vegetation, including removing 52 acres of relatively undisturbed piñon-juniper habitat, 20.8 acres of sagebrush scrub habitat, 2.74 acres of wetlands, and 2.17 acres of riparian habitat. A large area of piñon-juniper habitat east of Bondad Hill would be removed under Alternative 3. Approximately 2,200 feet of existing roadway would be relocated to the east side of Bondad Hill, and about 2,800 feet of old roadway would be maintained as a local road after realigning US 550. The abandoned road and shoulders would consist of approximately 6.3 acres and are mostly bordered on both sides by native piñon-juniper woodland. The piñon-juniper woodland habitat in the Bondad Hill area is important for wildlife use, and therefore Alternative 3 would result in the largest impacts to wildlife, as more undisturbed piñon-juniper habitat would be converted to roadway than the other alternatives. However, revegetating portions of the original alignment would replace some natural habitat.

3.2.3 Mitigation Measures (Preferred Alternative)

Mitigation for Terrestrial Wildlife

Issue W-1: Mortality to small and medium-sized terrestrial wildlife from vehicle collisions is expected to increase along with long-term habitat fragmentation and population losses from highway widening.

Mitigation Measure W-1: In addition to the four large wildlife crossing structures that will be installed as part of the Preferred Alternative, CDOT will install smaller wildlife

crossings utilizing the following guidelines and suggestions for small and medium-sized wildlife species:

- Install smaller-sized culverts spaced every 500 to 1,000 feet to increase habitat connectivity and access across US 550 for small- and medium-sized mammals, such as rodents, lagomorphs, coyotes, weasels, and foxes. These crossings will be constructed of small concrete box or pipe culverts (ranging from 3.3 to 4.95 feet in diameter) and will be placed in areas with vegetative cover, including uplands with herbaceous cover and drainages. These culverts will be partially buried to accommodate a natural substrate floor. Exact locations of these smaller culverts will be determined in consultation with CDOW as part of final design.
- Place approximately 1-foot of vegetative debris such as old stumps, logs, and brush inside (along one edge of the bottom) of the four large crossing structures as cover for small mammals and amphibians.
- Deer and elk migration patterns and associated locations of high crossing frequency may change in response to future growth and development within the US 550 corridor. Therefore, specific locations for the large wildlife crossings will be reanalyzed and specific locations for crossing structures decided prior to final highway design. The continued recording of collision locations along US 550 will provide increasingly accurate data on where deer are crossing the highway.
- The large wildlife crossing structures will require monitoring for three years post-construction to determine effectiveness. Monitoring will include continued collection of deer-vehicle collision data along US 550, as well as track surveys or motion-activated cameras within the structures.

Effectiveness: Measure W-1 would reduce impacts to wildlife from mortality from vehicle collisions and would prevent long-term habitat fragmentation and population losses from highway widening.

Mitigation for Birds

Issue W-2: Vegetation clearing, earth-moving, and other construction activities have the potential to alter breeding behavior and destroy nests of bird species protected under the MBTA, including raptors. Destruction or disturbance of nests that results in loss of eggs or young is a violation of the MBTA.

Mitigation Measure W-2A: Vegetation removal activities will be timed to the extent possible to avoid the migratory bird breeding season (April 1 through August 15). Areas that must be scheduled to have vegetation removed between April 1 and August 15 shall be surveyed for nests and cleared by a qualified biologist prior to the initiation of work, and a migratory bird nest depredation permit under the MBTA shall be obtained (if necessary), or appropriate inactive nest removal and hazing/exclusion measures shall be incorporated into the work to avoid the need to disturb active migratory bird nests.

Mitigation Measure W-2B: Complete raptor nest surveys prior to start of construction in order to identify active nests and potential areas where seasonal restrictions on construction may be required. If nests are located in the study area, protective buffer zones will be established around active nests during construction to avoid disturbance to

individual birds while nesting. CDOW recommended seasonal buffer zones for the following species (Table 3.2-10).

Table 3.2-10
Seasonal Buffer Zones

Species	Buffer	Timing
Golden eagle	1/4-mile	January 1 - July 15
Red-tailed hawk	1/3-mile	February 15 - July 15
Prairie falcon	1/2-mile	N/A
Northern goshawk	1/2-mile	March 1 - September 31

Mitigation Measure W-2C: Individual raptor perch trees removed in the ROW will be replaced at a 2:1 ratio, or as specified by state and federal wildlife agencies, to ensure raptor perch trees are replaced. Perch poles will be placed at a 1:1 ratio for raptor perch trees to mitigate for the loss of perching opportunities until replacement perch trees mature.

Mitigation Measure W-2D: Any demolition or structural work on existing bridge structures (such as the Animas Bridge) may potentially destroy or disturb swallows nesting on the underside of the bridge. Demolition or structural work on existing bridge structures will be scheduled to the extent possible between August 16 and March 31 to avoid impacts to nesting swallows. If bridge work must begin after April 1, nest surveys will be conducted prior to April 1 to determine if inactive nests are present. Appropriate hazing/exclusion measures or inactive nest removal will be used prior to the nesting season if nests are present to ensure that no active nests are disturbed during demolition and construction activities.

Effectiveness: The proposed mitigation for birds would eliminate impacts to nesting individuals as no active nests would be disturbed or removed during construction. No new nests would be destroyed as land-clearing would occur during non-breeding seasons. Perching opportunities for raptors would be effectively mitigated by the placement of perch poles and replacement of perch trees. Wintering or migrating individuals would be temporarily displaced from construction areas.

3.2.4 Residual Adverse Impacts

With the implementation of wildlife crossings, some small and medium-sized wildlife species would continue to suffer vehicle related mortality on the highway. However, it is expected that the total number of road-killed animals would decrease substantially with adequately designed and spaced wildlife crossings and fencing. Some percentage of deer would continue to be killed by vehicles as some animals may choose not to use underpasses, though fencing would prevent most individuals from accessing the road. Some animals avoid the vicinity of US 550 due to visual and auditory disturbances associated with higher traffic volumes and speeds. Future development in the study area would continue to result in loss of habitat and decrease local populations of wildlife.

After mitigation, wildlife would still incur a loss of habitat, resulting in permanent displacement of individuals from the areas of disturbance. Revegetated areas would require several years for vegetation to mature; and these areas would be of little value to

wildlife until vegetation is dense enough to provide adequate cover. Smaller-sized species would be killed by crushing or burial by construction equipment in areas where habitat would be removed for road widening or realignment. The loss of habitat would contribute to fragmentation and isolation of populations, as many species would avoid large open areas, such as road ROW. Table 3.2-11 shows the permanent impacts to wildlife habitat.

Table 3.2-11
Permanent Impacts after Mitigation

Alternative	Total Impacts (acres)	Permanent Impacts after Mitigation (acres)	Total Area Reclaimed (Acres)
Alternative 1	55.0	28.35	26.65
Alternative 2	60.0	29.29	30.71
Alternative 3	77.8	38.83	38.97

Replacement of raptor perch trees would require 10-50 years for newly planted trees to reach mature size. Therefore, these trees would not be used by raptors for a period of many years, resulting in decreased habitat value for raptors along riparian corridors. Additionally, the removal of trees along riparian crossing creates a larger gap for birds to cross to reach connected habitats, creating further fragmentation of habitat.

3.3 WETLANDS

Wetlands are those areas that are inundated or saturated with water at or near the surface of the soil for a sufficient duration during the growing season to develop characteristic soil and vegetation. Many wetlands are protected under the Clean Water Act (CWA) (Section 404) as waters of the United States and "special aquatic sites," and are under the jurisdiction of the US Army Corps of Engineers (Corps) for Section 404 permitting. Isolated and irrigation-induced wetlands may be nonjurisdictional areas that are not protected by Section 404.

Executive Order 11990 directs all federal agencies to avoid, if possible, adverse impacts to wetlands and to enhance the natural and beneficial values of wetlands. It is CDOT policy to avoid impacts to wetlands where possible, minimize impacts, and mitigate unavoidable impacts for all wetlands regardless of jurisdictional status.

For all action alternatives, a Section 404 Permit would be required for this project. The Corps would use the EA for its Section 404(b)(1) Alternatives Analysis and to support preparation of the Section 404 Permit.

3.3.1 Affected Environment

Methods

Wetlands were delineated by using the Routine Determination procedures described in the 1987 *USACOE Wetlands Delineation Manual* that require positive evidence of wetland hydrology, hydrophytic vegetation, and hydric soils (Environmental Laboratory 1987). The wetland study area included all areas within 300 feet of the centerline of the

existing highway, plus an expanded study area at Bondad Hill to allow consideration of various alternative roadway configurations.

Wetland Resources

The distribution of wetlands in the project area is shown on Figures 3.3-1 to 3.3-10. Wetlands delineated within the project corridor totaled approximately 13.03 acres (Table 3.3-1). More detailed information about the wetland study is provided in the US 550 Wetland Finding in Appendix F. The following sections describe the wetlands by groups, generally from south to north through the project area. Groups are defined based on connections to drainages (where there is a connection) or by wetland type for other wetlands.

Table 3.3-1
Summary of Wetland Groups in the US 550 Project Area

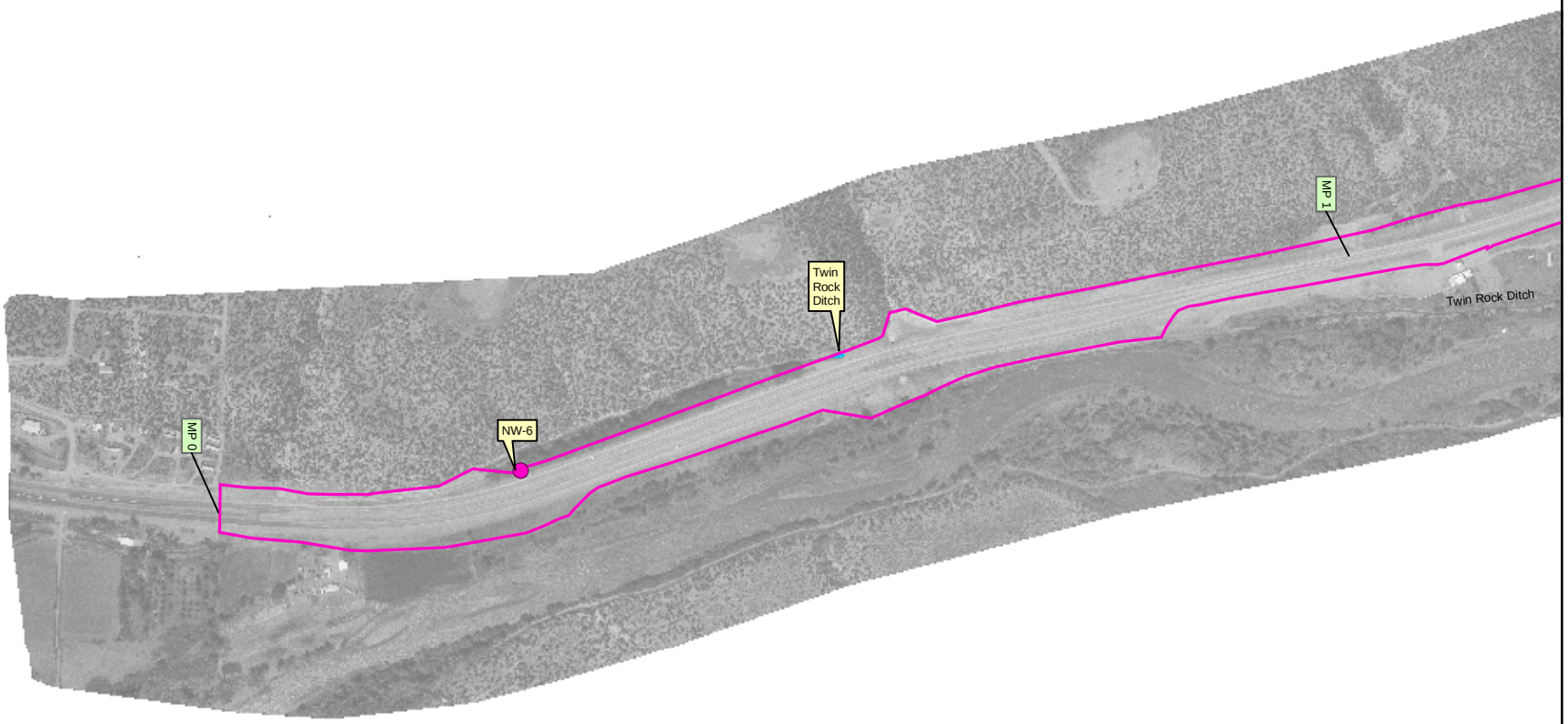
Wetland Group	Number of Wetlands	Total Area (acres)	Jurisdictional
State Line North Project Mitigation Wetlands	1	1.73	Yes
Deer Creek Wetlands	3	0.82	Yes
Animas River Wetlands	4	1.24	Yes
Unnamed Tributary of Florida River	6	1.46	Yes
Trumble Draw Wetlands	4	0.65	Yes
Hillside Seeps	5	0.67	No, except W-4
Isolated Irrigation Ditches in Uplands	22	3.25	No
Sewage Lagoons	11	0.13	No
Other Isolated Ponds	9	1.35	No
Roadside Ditches	5	0.27	No
Total	**70**	**13.03**	

Wetlands are depicted in Figures 3.3-1 to 3.3-10 and in the Wetland Finding in Appendix F

State Line North Project Mitigation Wetlands

Several wetlands were created in 2000 as part of the CDOT US 550 State Line North Project, under the Corps Permit Number 199975031. The original mitigation plan included the creation of 1.65 acres of wetland to mitigate the loss of 1.34 acres of jurisdictional wetland and 0.31 acre of nonjurisdictional wetland. A total of 1.85 acres of wetland was created during construction, including 1.43 acres at site CC, 0.04 acre at site FF, and 0.38 acre at site HH (URS 2002d). The wetland delineation of this area was conducted in November 2003 and the only wetland delineated was at site CC (Wetland 72) (Figure 3.3-2). Wetlands were not found at the other two sites.

Wetland 72 (Figure 3.3-2) consists of a constructed basin on the east side of US 550 and adjacent seepage and overflow areas. Water is provided by return flows from the Citizens Animas Ditch through an inlet in the northwestern corner of the wetland. The current area of this wetland within the highway ROW is 1.73 acres (Table 3.3-1);



Legend

- NW-10 — Non-Wetland Sample Point
- 10-A — Soil Pit Location
- Waters of the U.S.
- O-10 — Other Waters
- W-10 — Wetlands
- Wetland Study Area

500 250 0 500 1,000 Feet

US 550 EA

Distribution of Wetlands from MP 0 to MP 1.2
Figure 3.3-1

02/04/05

To and From MP Distances Are Approximate

\\S068NTFILE2\GIS\PROJECTS\US_550EA\MAPS\EA_FIG3-3-1_WETLANDS_LTR.MXD

Legend

US 550

NW-10 — Non-Wetland Sample Point

10-A — Soil Pit Location

Waters of the U.S.

Wetland Study Area

O-10 — Other Waters

W-10 — Wetlands

500 250 0 500 1,000 Feet

DOT

US 550 EA

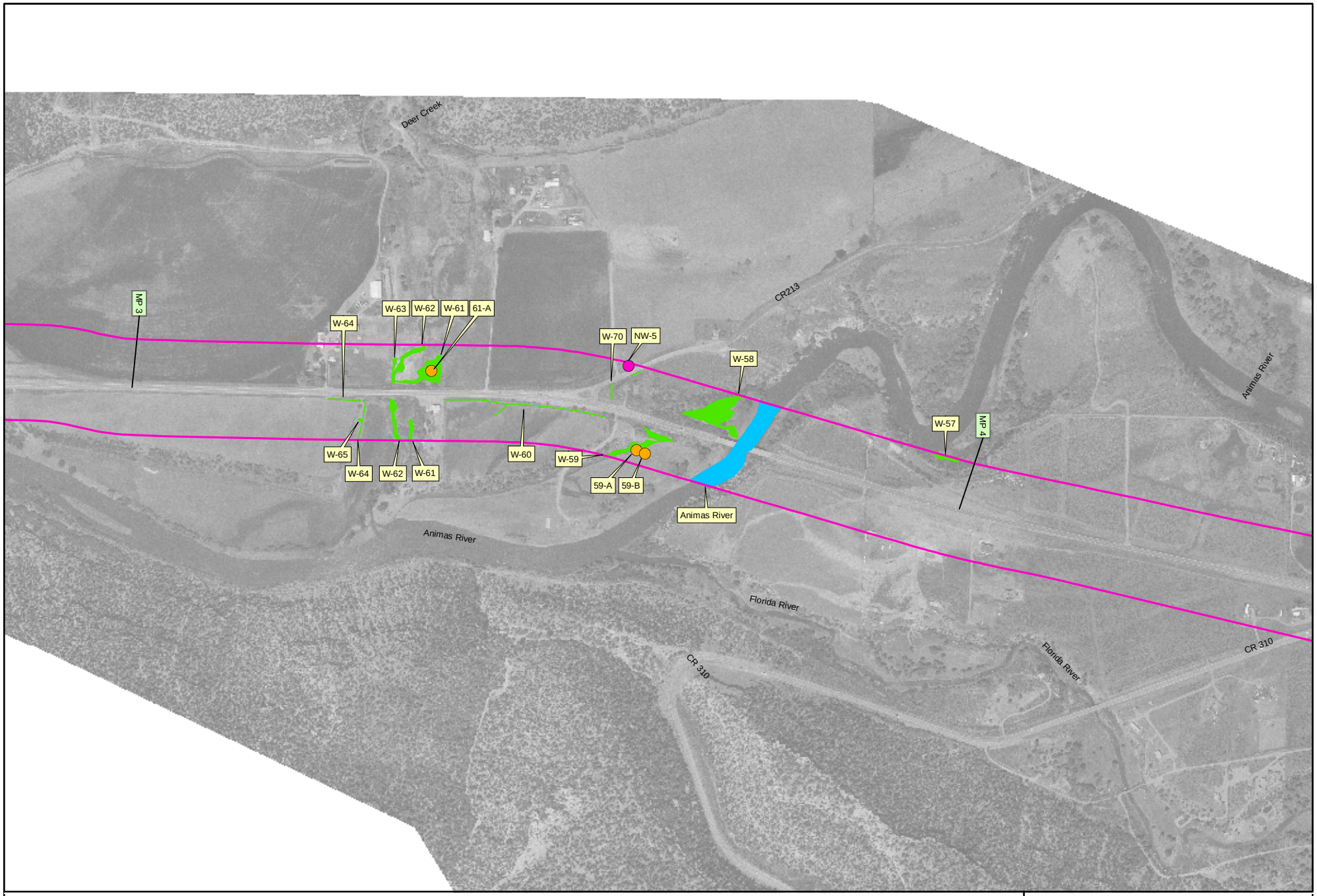
Distribution of Wetlands from MP 1.2 to MP 2.8

Figure 3.3-2

02/04/05

To and From MP Distances Are Approximate

\\S068NTFILE2\GIS\PROJECTS\US_550EA\MAPS\EA_FIG3-3-1_WETLANDS_LTR.MXD



Legend

NW-10 — Non-Wetland Sample Point

10-A — Soil Pit Location

Waters of the U.S.

Wetland Study Area

O-10 — Other Waters

W-10 — Wetlands

500 250 0 500 1,000 Feet

US 550 EA

Distribution of Wetlands from MP 2.8 to MP 4.4 Figure 3.3-3

02/04/05

To and From MP Distances Are Approximate

\\S068NTFILE2\GIS\PROJECTS\US_550EA\MAPS\EA_FIG3-3-1_WETLANDS_LTR.MXD

Legend

- NW-10 — Non-Wetland Sample Point
- 10-A — Soil Pit Location
- Waters of the U.S.
- O-10 — Other Waters
- W-10 — Wetlands
- Wetland Study Area

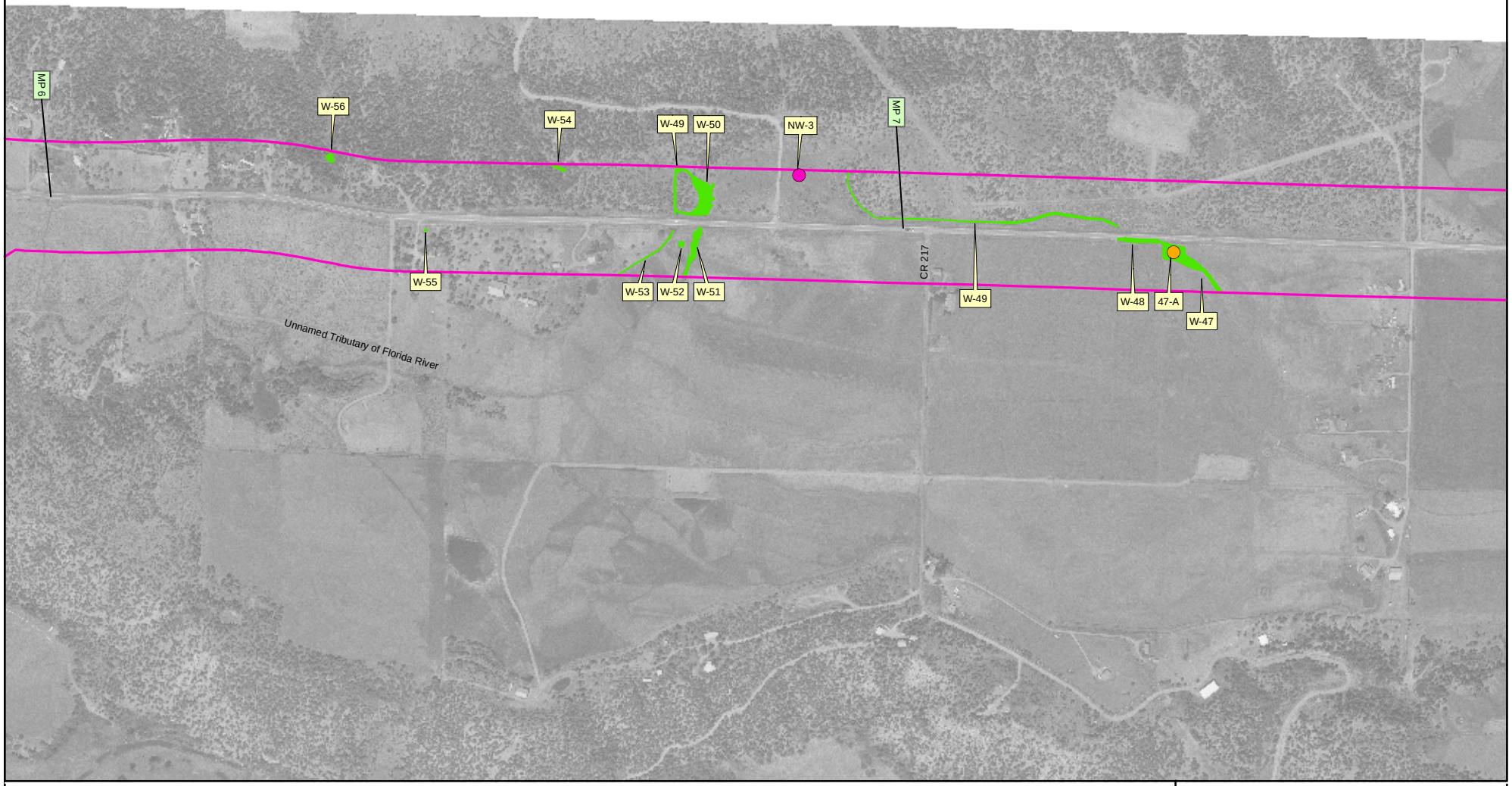
500 250 0 500 1,000 Feet

US 550 EA

Distribution of Wetlands from MP 4.4 to MP 6.0
Figure 3.3-4

02/04/05 To and From MP Distances Are Approximate

\\S068NTFILE2\GIS\PROJECTS\US_550EA\MAPS\EA_FIG3-3-1_WETLANDS_LTR.MXD



Legend

- NW-10 — Non-Wetland Sample Point
- 10-A — Soil Pit Location
- Waters of the U.S.
- O-10 — Other Waters
- W-10 — Wetlands
- Wetland Study Area

500 250 0 500 1,000 Feet

US 550 EA

Distribution of Wetlands from MP 6.0 to MP 7.6
Figure 3.3-5

02/04/05

To and From MP Distances Are Approximate

\\S068NTFILE2\GIS\PROJECTS\US_550EA\MAPS\EA_FIG3-3-1_WETLANDS_LTR.MXD

Legend

US 550

NW-10 — Non-Wetland Sample Point

10-A — Soil Pit Location

Waters of the U.S.

O-10 — Other Waters

W-10 — Wetlands

Wetland Study Area

500 250 0 500 1,000 Feet

DOT

US 550 EA

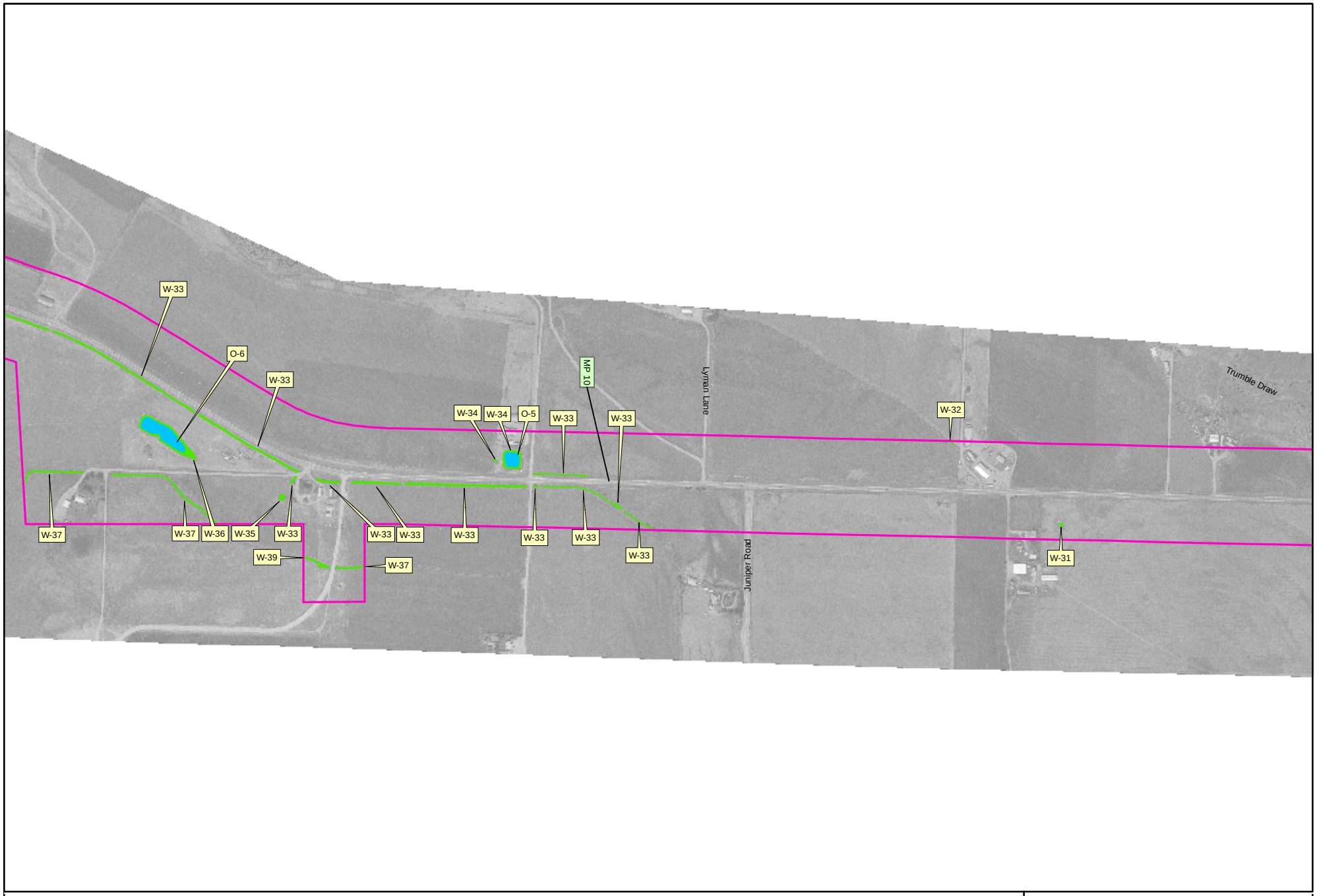
Distribution of Wetlands from MP 7.6 to MP 9.2

Figure 3.3-6

02/04/05

To and From MP Distances Are Approximate

\\S068NTFILE2\GIS\PROJECTS\US_550EA\MAPS\EA_FIG3-3-1_WETLANDS_LTR.MXD



\\S068NTFILE2\GIS\PROJECTS\US_550EA\MAPS\EA_FIG3-3-1_WETLANDS_LTR.MXD

Legend

US 550

NW-10 — Non-Wetland Sample Point

10-A — Soil Pit Location

Waters of the U.S.

O-10 — Other Waters

W-10 — Wetlands

Wetland Study Area

500 250 0 500 1,000 Feet

DOT

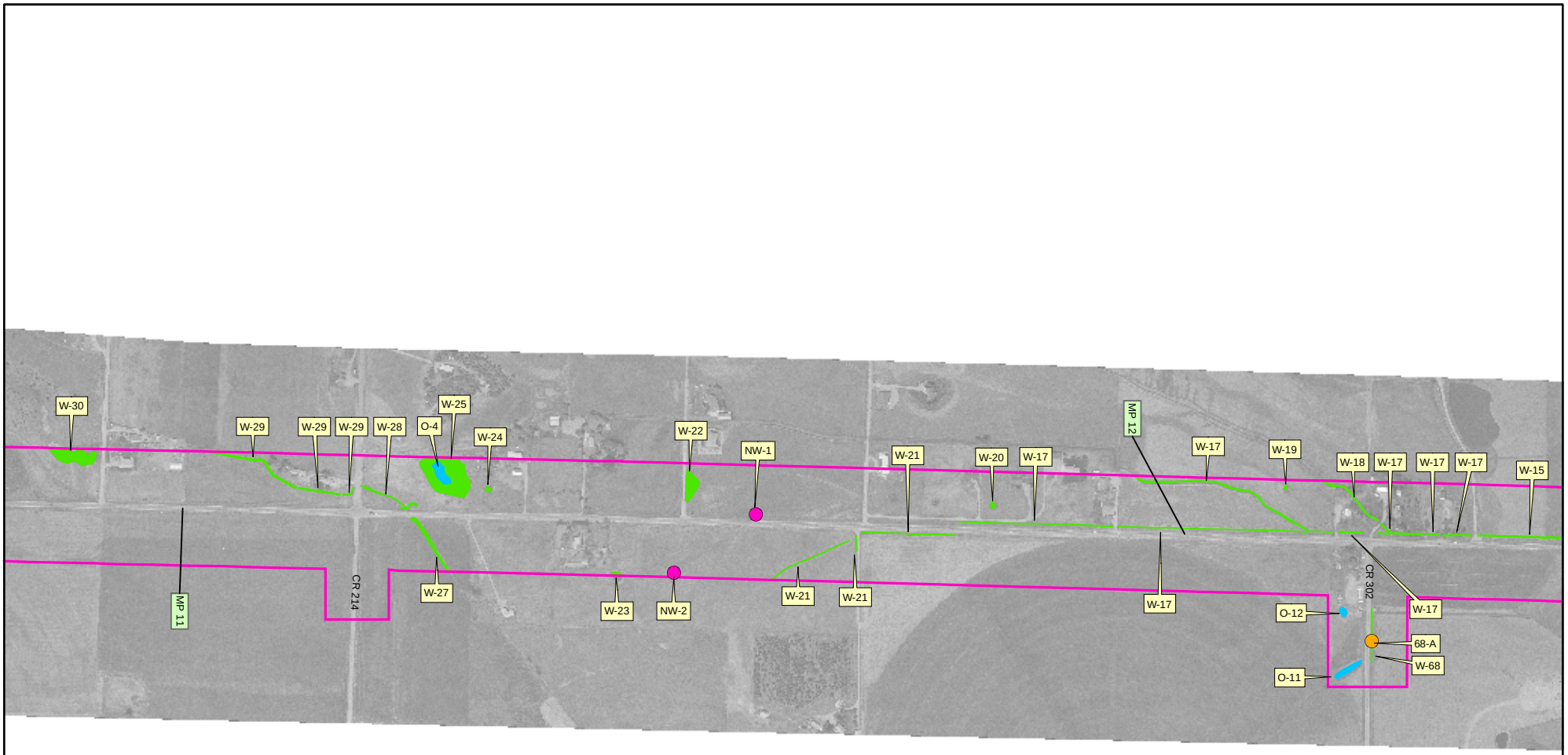
US 550 EA

Distribution of Wetlands from MP 9.2 to MP 10.8

Figure 3.3-7

02/04/05

To and From MP Distances Are Approximate



\\S068NTFILE2\GIS\PROJECTS\US_550EA\MAPS\EA_FIG3-3-1_WETLANDS_LTR.MXD

Legend

US 550

NW-10 — Non-Wetland Sample Point

10-A — Soil Pit Location

Waters of the U.S.

O-10 — Other Waters

W-10 — Wetlands

Wetland Study Area

500 250 0 500 1,000 Feet

DOT

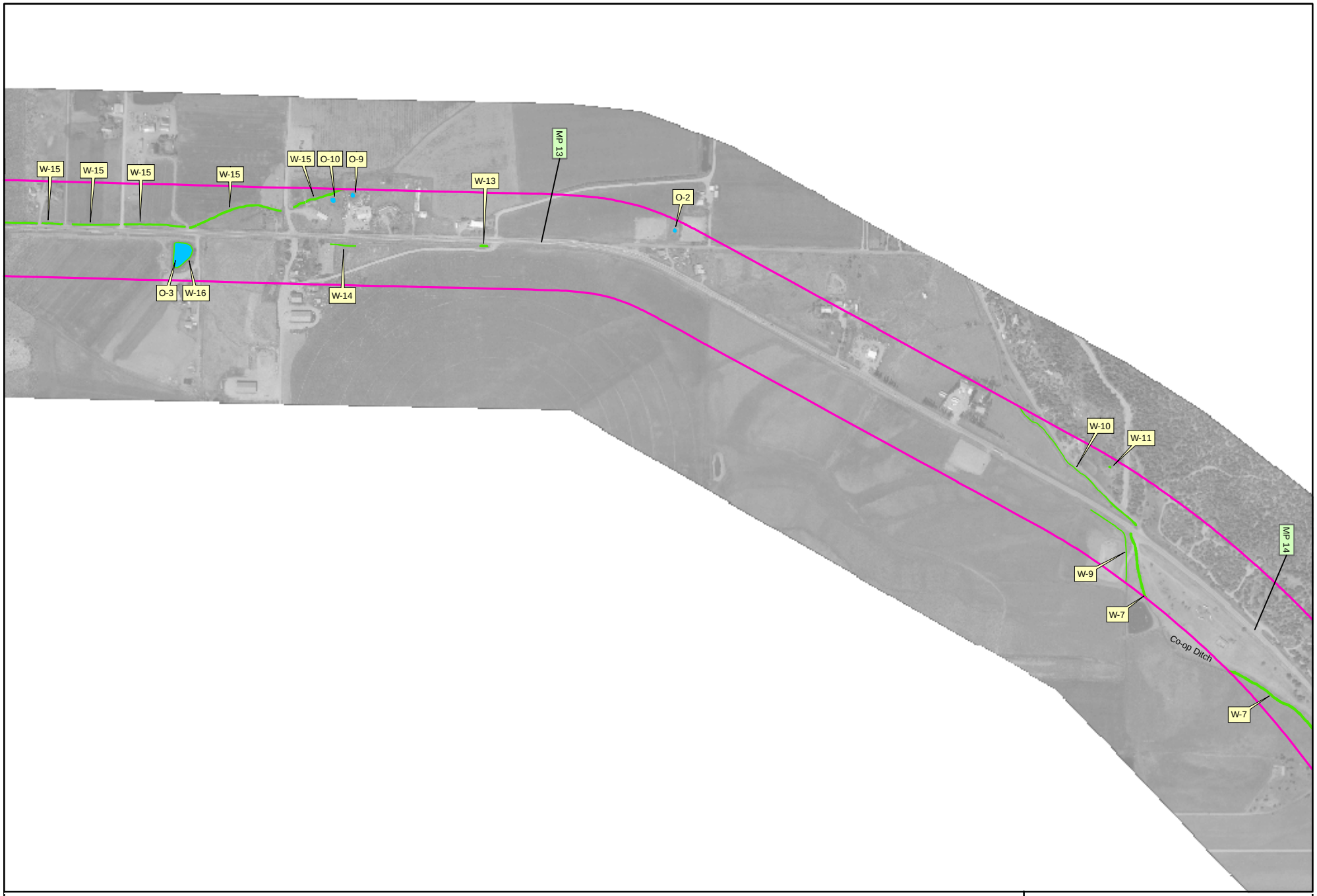
US 550 EA

Distribution of Wetlands from MP 10.8 to MP 12.4

Figure 3.3-8

02/04/05

To and From MP Distances Are Approximate



Legend

US 550

NW-10 — Non-Wetland Sample Point

10-A — Soil Pit Location

Waters of the U.S.

Wetland Study Area

O-10 — Other Waters

W-10 — Wetlands

500 250 0 500 1,000 Feet

DOT

US 550 EA

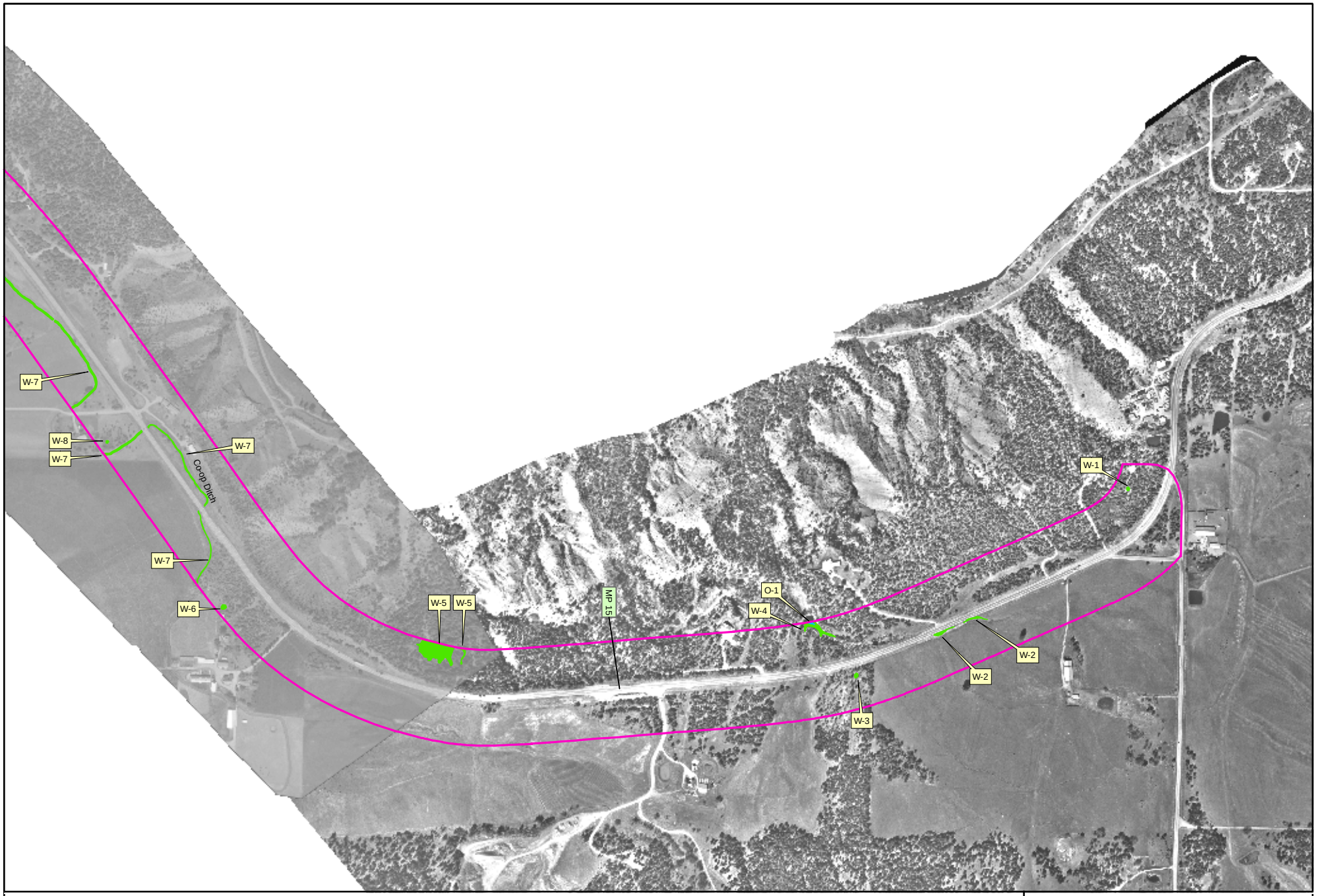
Distribution of Wetlands from MP 12.4 to MP 14.1

Figure 3.3-9

02/04/05

To and From MP Distances Are Approximate

\\S068NTFILE2\GIS\PROJECTS\US_550EA\MAPS\EA_FIG3-3-1_WETLANDS_LTR.MXD



Legend

US 550

NW-10 — Non-Wetland Sample Point

10-A — Soil Pit Location

Waters of the U.S.

O-10 — Other Waters

W-10 — Wetlands

Wetland Study Area

500 250 0 500 1,000 Feet

DOT

US 550 EA

Distribution of Wetlands from MP 14.1 to MP 15.4 Figure 3.3-10

02/04/05

To and From MP Distances Are Approximate

\\S068NTFILE2\GIS\PROJECTS\US_550EA\MAPS\EA_FIG3-3-1_WETLANDS_LTR.MXD

however, additional wetlands extend east of the ROW fence. Seepage and overflows from this wetland are captured by the Two Rock Ditch, which parallels the Animas River downgradient from the wetland. The Two Rock Ditch crosses the state line, and therefore, the wetland is considered jurisdictional.

Dominant wetland species observed include creeping spikerush (*Eleocharis palustris*), broadleaf cattail (*Typha latifolia*), Torrey rush (*Juncus torreyi*), pondweed (*Potamogeton* spp.), sandbar willow (*Salix exigua*), and Baltic rush (*Juncus balticus*). Most of the constructed wetland is occupied by a dense stand of broadleaf cattail. Pondweed occurs in small open water areas. The other species primarily occur in mixed stands on and below the eastern embankment of the wetland, watered by seepage and overflows.

Hydrologic indicators in the constructed portion of the wetland included inundation (most of the area), saturation, and sediment deposits. Hydrologic indicators in the seepage wetland include drainage patterns, limited areas of inundation, and saturation within the top 12 inches.

Paired soils pits (wetland and upland) were examined on the western side of Wetland 72, and an additional wetland soil pit was examined on the eastern side. Wetland soils exhibited low chroma in the constructed wetland and mottles on the embankment.

Deer Creek Wetlands

Deer Creek is a perennial tributary of the Animas River. Three wetlands occur along Deer Creek, including a wetland adjacent to the channel (Wetland 62), and seep-fed meadows that connect to Deer Creek (Wetlands 61 and 63; Figure 3.3-3). These wetlands are considered jurisdictional because they are adjacent and connected to Deer Creek, a named tributary of the Animas River. They are classified as palustrine emergent and riverine intermittent streambed (Cowardin et al. 1979).

Dominant wetland species observed include creeping spikerush, broadleaf cattail, jointed rush (*Juncus articulatus*), and Baltic rush. Adjacent areas are heavily grazed upland grassland and sparsely vegetated areas dominated by weedy species such as musk thistle (*Carduus nutans*), tansymustard (*Descurainia spp.*), common burdock (*Arctium minus*), common mallow (*Malva neglecta*), and amaranth (*Amaranthus spp.*).

All of the wetlands exhibited inundation and saturation in the upper 12 inches. The main channel of Deer Creek was included in the mapped area of Wetland 62 and consists of a fast-moving stream 6 to 8 feet wide. The source of hydrology for Wetlands 61 and 63 is seeps. The ultimate source of the seepage is likely to be the Citizens Animas Ditch, which is upgradient about 0.25 mile to the west. The flow in Deer Creek may also be discharge from the same ditch.

A soil pit was examined in Wetland 61 and hydric soil indicators included sulfidic odor, gleyed or low chroma colors, and aquic moisture regime. Soils are mapped as Ustic Torriorthents-Ustic Haplargids, 12 to 60 percent slopes. These soils occur on terrace edges and hillsides.

Animas River Wetlands

Four wetlands occur on the floodplain of the Animas River, near the US 550 bridge (Wetlands 57, 58, and 59; Figures 3.3-3), and near MP 3 (Wetland 66; Figure 3.3-2). These wetlands are considered jurisdictional because they were adjacent to and connected to the Animas River. These wetlands are classified as palustrine emergent, palustrine scrub/shrub, and palustrine aquatic bed (Cowardin et al. 1979). They include wetlands on the floodplain of the Animas River, as well as adjacent seepage areas on terraces adjoining the floodplain.

Dominant wetland vegetation in these wetlands includes broadleaf cattail, redtop (*Agrostis stolonifera*), woolly sedge (*Carex lanuginosa*), creeping spikerush, and sandbar willow. The upland perimeter of the wetlands is dominated by species such as cottonwoods *(Populus angustifolia* and *P. deltoides*), box elder (*Acer negundo*), chokecherry (*Prunus virginiana*), alder (*Alnus incana*), wild licorice (*Glycyrrhiza lepidot*a), juniper (*Juniperus scopulorum*), and big sagebrush (*Artemisia tridentata*).

The primary hydrological indicators observed in all four wetlands were inundation and saturation in the upper 12 inches. All of the wetlands have seeps that contribute to wetland hydrology, and two of the wetlands (Wetlands 58 and 59) also receive irrigation return flows.

Soils are mapped as Ustic Torriorthents-Ustic Haplargids, 12 to 60 percent slopes, and Tefton loam (US Department of Agriculture [USDA] Soil Conservation Service [SCS now Natural Resources Conservation Service (NRCS)] 1982). Ustic Torriorthents-Ustic Haplargids are on terrace edges and hillsides. Tefton loam is a deep, somewhat poorly drained soil of floodplains and alluvial valley floors.

Wetlands Associated with Unnamed Tributary of Florida River

Six wetlands (Wetlands 47, 48, 49, 50, 51, and 53) appear to be connected via surface flow to the Florida River and all are palustrine emergent bed (Cowardin et al. 1979) (Figures 3.3-5). They appear to represent a route for irrigation return flows. The United States Geological Survey (USGS) topographic map shows most of these wetlands as part of an unnamed tributary to the Florida River, and the entire group of wetlands appears to be connected to the Florida River. This group of wetlands is therefore considered jurisdictional.

These wetlands are dominated by creeping spikerush, Baltic rush, reed canary-grass (*Phalaris arundinacea*), and broadleaf cattail. Wetlands 47, 48, 50, and 51 are located within agricultural land (hay meadows and pastures), and Wetlands 49 and 50 are in sagebrush scrub and piñon-juniper woodland.

The primary hydrological indicators observed were inundation, saturation in the upper 12 inches, and drainage patterns. Surface water was present at all of the wetlands, except Wetland 47.

One soil pit was examined in Wetland 47. The soil exhibited low chroma and numerous small mottles. Soils are mapped as Falfa clay loam, 3 to 8 percent slopes, a deep, well-drained soil of mesa tops.

Trumble Draw Wetlands

Four wetlands (Wetlands 27, 28, 29, and 30) occur along the Trumble Draw drainage (Figure 3.3-8). These wetlands were considered jurisdictional because they are connected to Trumble Draw, a named tributary of the Animas River. They are classified as palustrine emergent and palustrine scrub/shrub (Cowardin et al. 1979).

Dominant plant species in these wetlands include redtop, sandbar willow, broadleaf cattail, reed canary-grass, and small-fruit bulrush (*Scirpus microcarpus*). Surrounding vegetation consists of alfalfa and grass hay fields for Wetlands 27, 28, and 29, and pastures dominated by Kentucky bluegrass (*Poa pratensis*) and timothy (*Phleum pratense*) for Wetland 30.

The primary hydrology indicators are inundation and saturation in the upper 12 inches. Wetlands 27, 28, and 29 have defined channels, and the wetlands are confined to a fringe on one side of the ditch. Wetland 30 is fed by an irrigation ditch but has no defined channel within it.

Soils are mapped as Falfa clay loam, 3 to 8 percent slopes. This is a deep, well-drained soil of mesa tops.

Hillside Seeps

This group includes five wetlands (Wetlands 4, 5, 54, 56, and 65; Figures 3.3-3, 3.3-5, and 3.3-10). Wetland 4 is the only one of this group that appears to be jurisdictional and is located on a mapped USGS intermittent drainage that connects to the Animas River. Wetland 4 also includes an area of open water. Wetland 56 has strong flow from a spring, but is apparently captured for irrigation on Sunnyside Mesa, which lies between the base of the slope and the Animas River. This wetland is therefore considered nonjurisdictional. Wetlands 5, 54, and 65 are isolated and are not on mapped drainages; therefore, they were considered nonjurisdictional. Wetlands 5, 54, 56, and 65 are classified as palustrine emergent, and Wetland 4 is classified as palustrine emergent, palustrine scrub/shrub, and palustrine aquatic bed (Cowardin et al. 1979).

Dominant vegetation in these wetlands includes redtop, sandbar willow, broadleaf cattail, caraway (*Carum carvi*), and triangular-valve dock (*Rumex triangulivalvis*). Four of the wetlands (Wetlands 4, 5, 54, and 56) are located within piñon-juniper woodlands, and the fifth, Wetland 65, is in a pasture at the base of a slope below an irrigated agricultural field. Vegetation adjacent to the wetlands includes piñon (*Pinus edulis*), juniper *(Juniperus osteospermum*), Gambel oak (*Quercus gambelii*), narrowleaf cottonwood (W-4), aster (*Aster* spp.), Canada thistle (*Cirsium arvense*), cocklebur (*Xanthium strumarium*), Siberian elm (*Ulmus pumila*), skunkbush sumac (*Rhus trilobata*), and rubber rabbitbrush (*Chrysothamnus nauseosus*).

The primary hydrological indicators observed in all five wetlands was inundation and saturation in the upper 12 inches. Wetland 56 includes a spring, Wetlands 5, 54, and 65 are seepage areas, and Wetland 4 includes open water behind a small dam that was mapped separately.

Isolated Irrigation Ditch Wetlands in Uplands

Nineteen fringe wetlands along irrigation ditches occur in upland portions of the study area. All of them are considered nonjurisdictional because they are both isolated and irrigation-induced.

Dominant plant species in these wetlands include redtop, creeping spikerush, Baltic rush, reed canary-grass, timothy, and sandbar willow. A few peachleaf willow (*Salix amygdaloides*), Siberian elm, and Russian olive (*Elaeagnus angustifolia*) individuals occur along the banks of some irrigation ditches. The irrigation ditches are located within agricultural pastures and meadows, and along roadsides. Adjacent non-wetland vegetation included goldenrod (*Salidago* spp.), wild lettuce (*Lactuca serriola*), smooth brome (*Bromus inermis*), common sunflower (*Helianthus annuus*), showy milkweed (*Asclepias speciosa*), curlycup gumweed *(Grindelia speciosa*), field horsetail (*Equisetum arvense*), bluegrass, Canada thistle, common mullein (*Verbascum thapsus*), chicory (*Chicorium intybus*), yellow sweetclover (*Melilotus officinalis*), red clover (*Trifolium pratense*), plantain (*Plantago* spp), aster (*Aster* spp.), and asparagus (*Asparagus officinalis*).

The primary hydrological indicators observed were inundation, saturation in the upper 12 inches, drainage patterns, and drift lines.

Soils were mapped as Falfa clay loam, 1 to 3 and 3 to 8 percent slopes, and Witt loam, 1 to 3 percent slopes. These are deep, well-drained soils of mesa tops and uplands.

Sewage Lagoons

Small household sewage lagoons occur at several locations throughout the project area (11 wetlands). All of these wetlands are isolated in uplands and are considered nonjurisdictional. These wetlands are classified according to Cowardin et. al. (1979) as primarily palustrine emergent. About 50 percent or more of their surface usually is open water.

Dominant plant species in these wetlands are barnyard grass, creeping spikerush, broadleaf cattail, and lesser duckweed (*Lemna minor*). Two sewage lagoons (Wetlands 1 and 6) are located in piñon-juniper woodlands, and all others are located in pastures or other grassland. Vegetation around the perimeter of the wetlands is generally weedy and includes yellow sweetclover, common sunflower, Kochia (*Kochia scoparia*), wild lettuce, smooth brome, and Canada thistle.

The primary hydrological indicators observed in all of these wetlands were inundation and saturation in the upper 12 inches. No soil pits were examined because all of the wetlands were dominated by wetland indicator species. Soils were mapped as Falfa clay loam, 1 to 3 and 3 to 8 percent slopes, and Witt loam, 3 to 8 percent slopes. These are deep, well-drained soils of mesa tops and uplands.

Wetlands in Other Isolated Ponds

Wetlands in ponds other than sewage lagoons occur at several places in the study area, in upland areas. They include Wetlands 3 (Figure 3.3-10); 16 (Figure 3.3-9); 19, 23, 25, and 26 (Figure 3.3-8); 34, 36 (Figure 3.3-7); and 41 and 67 (Figure 3.3-6). All are

considered nonjurisdictional because they are in uplands, with no apparent connection to jurisdictional drainages. All of these wetlands are primarily palustrine emergent.

The most common plant species throughout these wetlands are creeping spikerush, few-flowered spikerush (*Eleocharis quinqueflora*), willow-reed (*Polygonum lapathifolium*), and pondweed. These wetlands are generally located within pastures and hay meadows, except Wetland 3, which is in a piñon-juniper woodland.

The primary hydrological indicators observed were inundation and saturation in the upper 12 inches. Wetland 3 was dry at the time of survey; its indicators were water marks and sediment deposits.

Soil pits were not examined at most of these wetlands because the vegetation was dominated by wetland (hydrophytic) vegetation. Paired soil pits (wetland and adjacent upland) were located at Wetland 67. The wetland pit was on the perimeter of the wetland because nearly all of the wetland was inundated at the time of the survey. The soil pit did not exhibit hydric characteristics, but it was assumed that hydric soils are present due to the pit being on the margin, and the evident hydrology and hydrophyic vegetation. All of these wetlands are on soils mapped as Falfa clay loam, 1 to 3 and 3 to 8 percent slopes.

Roadside Ditches

Five roadside ditch wetlands occur in the study area, at widely scattered locations. These include Wetlands 2 (Figure 3.3-10); 13 (Figure 3.3-9); 22 (Figure 3.3-8); 46 (Figure 3.3-6), and 71 (Figure 3.3-2). These wetlands are all isolated and considered nonjurisdictional. All roadside ditch wetlands are classified as palustrine emergent and/or palustrine scrub/shrub (Cowardin et al. 1979).

Dominant vegetation in these wetlands includes creeping spikerush, sandbar willow, small-fruit bulrush, broadleaf cattail, foxtail barley (*Hordeum jubatum*), and barnyard grass (*Echinochloa crusgalli*). Wetland 72 is within the US 550 ROW and was recently constructed as part of the State Line North Project. Vegetation on the edges of these wetlands is mainly smooth brome (*Bromus inermis*) and cheatgrass (*Bromus tectorum*).

The primary hydrological indicators observed were sediment deposits (Wetlands 2, 46, and 71), drainage patterns (Wetlands 2 and 22), and saturation in the top 12 inches (Wetlands 13 and 46).

A soil pit was examined in Wetland 71. Hydric characteristics were not observed, but the soil is considered to be hydric because the area was recently constructed, the soils appeared to be from mixed origins (from construction), and hydric characteristics have not had time to develop. A paired upland soil pit was also examined. Soil pits were not examined in the other wetlands because most of the vegetation was dominated by wetland species. Soils are mapped as Falfa clay loam, 1 to 3 percent and 3 to 8 percent. These are deep, well-drained soils of mesa tops.

Other Waters

Other aquatic features are also regulated as waters of the United States under Section 404 of the CWA including intermittent and perennial streams. Other waters include five streams, six ponds, and several sewage lagoons and irrigation ditches. Descriptions of

these areas are provided below. Streams are jurisdictional under Section 404 of the CWA, but the ponds, sewage lagoons, and irrigation ditches are isolated and therefore nonjurisdictional.

Animas River. About 700 linear feet of the Animas River are within the study area, where US 550 crosses it on a bridge just above its confluence with the Florida River (Figure 3.3-3). The river is approximately 110 feet wide, and 1.7 acres of river channel are within the study area. The Animas River is one of the major rivers of southwestern Colorado and flows south to join the San Juan River in New Mexico.

Deer Creek. US 550 crosses Deer Creek on a bridge about 0.5 mile south of the Animas River crossing (Figure 3.3-3). Deer Creek was mapped as part of Wetland 61 because the fringing wetlands along the stream channel and on islands within the channel were larger than the open water part of the stream. Deer Creek had a fast-moving open water channel about 6 to 8 feet wide at the time of the survey. Deer Creek has a watershed area of about 3,000 acres and joins the Animas River about 700 feet east of the study area.

Intermittent Stream O-8. Other water O-8 is an intermittent stream that originates in a roadside ditch near the top of Bondad Hill and flows more than 0.5 mile across the study area toward the Florida River (Figure 3.3-4). It is assumed that it reaches the Florida River, which is about 400 feet away from the bottom end of the mapped stream. This drainage is not mapped on the Bondad Hill USGS topographic map. The bottom of the channel ranged from 4 to 8 feet wide, or an average of about 5 feet wide. It has a total area of about 0.4 acre within the study area.

Intermittent Stream O-13. This intermittent drainage originates on forested hills west of the Animas River (Figure 3.3-2). It crosses the CDOT ROW for about 300 feet, of which 50 feet are covered by the US 550 bridge. The stream averages 30 to 40 feet wide within the highway ROW, but is much narrower above and below the ROW. The portions within the US 550 ROW were widened and armored as part of the State Line North Project. This drainage has a watershed of about 900 acres and connects to the Animas River about 500 feet downstream of the study area. It is mapped as an intermittent stream on the Long Mountain and Bondad Hill USGS topographic maps.

Intermittent Stream O-14. This intermittent stream also originates on forested hills west of the Animas River (Figure 3.3-2). It crosses the US 550 ROW for about 250 feet, of which about 50 feet are under the bridge. The stream averages about 40 feet wide within the ROW, but is much narrower above and below the ROW. The portions within the US 550 ROW were widened and armored as part of the State Line North Project. This drainage has a watershed of about 250 acres and connects to the Animas River about 800 feet downstream of the study area. It is mapped as an intermittent stream on the Long Mountain and Bondad Hill USGS topographic maps.

Sewage Lagoons. Other waters O-2, O-9, O-10, and O-12 are sewage lagoons similar to the sewage lagoons previously described, except that they contained only open water (Figures 3.3-9 and 3.3-10).

Other Isolated Ponds. Other waters 0-3, 0-4, 0-5, and 0-6 are ponds with open water. Each of these have a narrow wetland fringe around them that is described in the wetland section. Other waters O-7 and O-11 are ponds without wetland fringes. These six ponds

are in upland areas and are isolated from other waters of the United States (Figures 3.3-4 to 3.3-8).

Irrigation Ditches. Most of the larger ditches in the project area are delineated as wetlands, but three major irrigation ditches are considered as other waters because they did not meet the criteria for wetlands. The Citizens Animas Ditch and Twin Rock Ditch are large ditches mapped and named on the USGS topographic maps. Paxton Ditch is not shown on the Bondad Hill USGS topographic map and is difficult to see on aerial photographs because it traverses a wooded area on the northeast side of Bondad Hill. The numerous small field ditches in and adjacent to irrigated farmland are not considered to be waters of the United States, but are delineated as wetlands where they meet wetland criteria.

3.3.2 Environmental Consequences

Impacts Specific to No Action

There would be no permanent wetland impacts resulting from the No Action Alternative.

Impacts Common to All Action Alternatives

Direct and permanent impacts to wetlands were assessed by overlaying the highway construction footprint and the mapped wetland areas. A total of 2.11 acres of wetlands are directly impacted by all action alternatives. All wetlands within the construction footprint of the highway and the berm would be filled and permanently lost.

Acres of impacted wetlands with moderate or high functions common to all alternatives are shown in Table 3.3-2.

Table 3.3-2
Acres of Moderate to High Wetland
Functions Impacted by All Action Alternatives

Wetland Function	Acres of Impact
Federal Threatened & Endangered Species Habitat	0.5
State Special Status Species Habitat	0.1
General Fish/Aquatic Habitat	0.1
Flood Attenuation	0.0
Sediment, Nutrient, & Toxicant Retention	1.0
Sediment/Shoreline Stabilization	0.0
Production Export/Food-chain Support	1.5
Uniqueness	0.1
Recreation/Educational Potential	0.0

Impacts to wetlands have been considered during development of the alternatives. Wetlands have been avoided and impacts have been minimized in a number of areas. Many of the impacts are unavoidable because of design constraints or needs.

Temporary impacts during construction may result from installation of silt fencing adjacent to the ROW. Disturbed areas would be restored to their original contours, and no permanent long-term impacts to wetland size or functions are expected in these areas. Minor and mostly temporary impacts would occur following construction of the highway from routine maintenance activities, including winter sanding and maintenance of culverts and roadside ditches.

Impacts would be the same for all action alternatives, except at the Animas River, Deer Creek, and Bondad Hill. Impacts common to all action alternatives are described below.

Milepost 0.0 – 3.1

There would be only minor impacts to wetlands from MP 0.0 to MP 3.1 because wetland impact and mitigation has already taken place as part of the US 550 State Line North Project in 2000. The roadway alignment for this portion of the project area would be the same for all alternatives. Approximately 0.01 acre of nonjurisdictional wetlands would be directly and permanently impacted (Wetland 71). Wetland 71 is associated with a roadside ditch and would be filled during the construction of the roadway embankment. This wetland has no moderate- or high-rated functions.

Milepost 3.1 – 6.6

Several wetlands would be affected by all action alternatives. However, impacts to the largest wetlands would vary by alternative, as described below for each alternative.

Hillside Seeps. Less than 0.01 acre of nonjurisdictional hillside seep wetlands would be directly and permanently impacted by all action alternatives. Wetland 65 would be filled in this section of the roadway as result of the construction of the embankment. Indirect impacts associated with the loss of this wetland include the loss of high functions for groundwater discharge and moderate general wildlife habitat.

Sewage Lagoons. Less than 0.01 acre of nonjurisdictional wetlands associated with sewage lagoons (Wetland 55) would be directly impacted (permanently filled). Indirect impacts associated with the loss of this wetland include the loss of moderate functions for sediment and nutrient retention.

Milepost 6.6 – 10.5

Improvements to this section would directly and permanently impact 1.47 acres of wetlands, including 0.55 acres of jurisdictional wetlands, for all action alternatives. Most of the impacts would occur to wetlands associated with an unknown tributary of Florida River and wetlands associated with irrigation ditches

Unnamed Tributary to the Florida River. Direct and permanent impacts to the Wetlands (47, 48, 50, 51, 53) associated with the unnamed tributary to the Florida River (jurisdictional) would account for loss of 0.55 acre of wetlands. About 50 percent of the impacts would occur at Wetland 47. These wetlands would be filled as part of the roadway embankment construction. Wetland 50 is rated as moderate for general wildlife habitat, Wetlands 47 and 50 are rated as moderate for surface water storage, and Wetlands 47, 48, 50 and 51 are rated as moderate for sediment and nutrient retention.

Isolated Irrigation Ditches in Uplands. The roadway design would result in the fill of 0.89 acre of nonjurisdictional wetlands associated with isolated irrigation ditches in

upland areas (Wetlands 33, 38, 42, 44, and 45). Wetland 33 is rated as moderate for general wildlife habitat, surface water storage, and production export. Other wetlands and wetland functions are rated as low or not applicable.

Sewage Lagoons. Approximately 0.02 acre of nonjurisdictional wetlands associated with a sewage lagoon (Wetland 52) would be permanently impacted in this roadway section. This wetland would be filled as part of the roadway embankment construction and is rated as moderate for sediment and nutrient retention.

Roadside Ditch. About 0.01 acre of Wetland 46 would be impacted by the project. No functions are rated as moderate or high.

Milepost 10.5 – 15.4

Improvements to MPs 10.5 through 15.4 would permanently impact 0.64 acre of wetlands, including 0.07 acre of jurisdictional wetlands. Most of the impacts would occur to wetlands associated with irrigation ditches.

Trumble Draw Wetlands. Roadway embankment construction would result in the permanent loss of a portion of the jurisdictional wetlands associated with Trumble Draw (Wetland 27). Impacts to wetlands would total 0.07 acre. All of the functions of these wetlands are rated as low or not applicable.

Isolated Irrigation Ditches in Uplands. All alternatives would result in the fill of 0.48 acre of nonjurisdictional wetlands (Wetlands 7, 9, 10, 14, 17, and 21*)* associated with isolated irrigation ditches in upland areas. A number of wetlands had moderate rated functions:

- Federal threatened or endangered species – Wetlands 7 and 10
- General wildlife habitat – Wetlands 10 and 14
- Surface water storage – Wetland 7
- Production export – Wetlands 7, 9, 10, and 21

Other Isolated Ponds. Approximately 0.03 acre of nonjurisdictional wetlands associated with isolated ponds (Wetlands 3 and 16) would be permanently impacted in this roadway section. These wetlands would be filled as part of the roadway embankment construction. Wetland 3 is rated as moderate for sediment and nutrient retention, and Wetland 16 is rated as moderate for state special status species habitat, general wildlife habitat, general fish habitat, sediment and nutrient retention, and production export, and high for groundwater recharge.

Roadside Ditches. A total of 0.07 acre of roadside ditch wetlands would be filled as a result of improvements to this roadway section. Both Wetlands 2 and 13 are considered nonjurisdictional. Wetland 2 is rated as moderate for general wildlife habitat and sediment and nutrient retention.

Other Waters. Road construction would impact 0.25 acre of other water O-3, an isolated pond. This would eliminate most of the pond.

Impacts Specific to Alternative 1

Alternative 1 would permanently impact 2.70 acres of wetlands and 0.28 acres of other waters, including 1.14 acres of jurisdictional wetlands (Table 3.3-3). Most of the impacts would occur to wetlands associated with the Animas River and Deer Creek.

Animas River Wetlands. Alternative 1 would directly impact 0.32 acre of jurisdictional wetlands associated with the Animas River - Wetlands 58 and 59 on the south side of the bridge crossing. Impacts would primarily result from placement of fill associated with the roadway embankment. Wetland 58 on the west side of the highway is a highly diverse natural wetland with high functions for federal and state endangered or threatened species, general wildlife habitat, sediment and nutrient retention, and groundwater discharge; and moderate functions for surface water storage, production export, and uniqueness. Wetland 59 on the east side of the highway has high functions for groundwater discharge, and moderate functions for general wildlife habitat, sediment and nutrient retention, and production export.

Deer Creek Wetlands. Portions of Wetlands 61 and 62 would be filled as part of the roadway embankment construction and expansion of the box culvert. Direct and permanent impacts to these wetlands associated with Deer Creek from Alternative 1 would account for a loss of 0.20 acre of jurisdictional wetlands. Wetland 61 has moderate functions for production export and high functions for groundwater discharge. Wetland 62 has moderate functions for general fish/aquatic habitat and production export.

Isolated Irrigation Ditches in Uplands. Alternative 1 would directly impact 0.07 acre of nonjurisdictional wetlands (Wetlands 60, 64, and 70) associated with isolated irrigation ditches in upland areas. These wetlands would be filled as part of the roadway embankment construction. These wetlands do not have any high- or moderate-rated wetland functions.

Other Waters. A relatively small portion (0.03 acre) of intermittent stream O-8 originating near the top of Bondad Hill would be filled as part of the roadway embankment construction. There would be no permanent impacts within the channel of the Animas River, because the piers would be placed outside the channel. The large piers of the old bridge within the channel would be removed.

Table 3.3-3
Summary of Permanent Wetland Impacts by Alternative

Alternative and Section	Jurisdictional Wetlands (acres)	Nonjurisdictional Wetlands (acres)	Total Wetlands (acres)
No Action Alternative			
Total	**0.00**	**0.00**	**0.00**
Alternative 1			
Total Common to All Action Alternatives	0.62	1.49	2.11
MP 3.1 – 6.6	0.52	0.07	0.59
Total	**1.14**	**1.56**	**2.70**

Alternative and Section	Jurisdictional Wetlands (acres)	Nonjurisdictional Wetlands (acres)	Total Wetlands (acres)
Alternative 2			
Total Common to All Action Alternatives	0.62	1.49	2.11
MP 3.1 – 6.6	0.52	0.04	0.56
Total	**1.14**	**1.53**	**2.67**
Alternative 3			
Total Common to All Action Alternatives	0.62	1.49	2.11
MP 3.1 – 6.6	0.55	0.08	0.63
Total	**1.17**	**1.57**	**2.74**

In addition to those impacts to wetland functions described in Impacts Common to All Action Alternatives, Alternative 1 has 0.1 acre less impact for three functions, primarily because of less impact at Wetland 58 (Table 3.3-4).

Table 3.3-4
Acres of Moderate to High Wetland Functions Impacted by Alternative

Wetland Function	Acres of Impact		
	Alternative 1	Alternative 2	Alternative 3
General Wildlife Habitat	1.0	1.0	1.1
Surface Water Storage	1.2	1.2	1.3
Groundwater Discharge/Recharge	0.4	0.4	0.5

Impacts Specific to Alternative 2 (Preferred Alternative)

The impacts of Alternative 2 would be very similar to Alternative 1. Alternative 2 would directly and permanently impact 2.67 acres of wetlands and 0.28 acre of other waters, including 1.14 acres of jurisdictional wetlands (Table 3.3-4). Differences between Alternative 2 and Alternative 1 are described below.

Animas River Wetlands. Alternative 2 would directly impact 0.32 acre of wetlands associated with the Animas River (jurisdictional), the same as Alternative 1. Impacts would be the result of the placement of fill associated with the roadway embankment. The functions of these wetlands are described under Alternative 1.

Deer Creek Wetlands. Permanent impacts to the wetlands associated with Deer Creek (jurisdictional) from Alternative 2 would be very similar to those described for Alternative 1 (.001 acre less impact).

Isolated Irrigation Ditches in Uplands. Alternative 2 would have less impact (0.03 acre) to nonjurisdictional wetlands associated with isolated irrigation ditches in upland areas (Wetlands 60, 64, and 70).

Other Waters. Impacts to the intermittent tributary on Bondad Hill would be the same, 0.03 acre.

Impacts Specific to Alternative 3

Alternative 3 would permanently impact 2.74 acres of wetlands and 0.4 acre of other waters, including 1.17 acres of jurisdictional wetlands (Table 3.3-4).

The impacts of Alternative 3 would be the same as Alternative 1 for all wetlands except at the Animas River and Deer Creek. In addition, Alternative 3 would affect Paxton Ditch, a non-wetland water body.

Animas River Wetlands. Alternative 3 would directly and permanently impact 0.36 acre of wetlands associated with the Animas River (jurisdictional). Impacts would be the result of the placement of fill associated with the roadway embankment. The functions of these wetlands are described under Alternative 1.

Deer Creek Wetlands. Permanent impacts to the wetlands associated with Deer Creek (jurisdictional) would be 0.19 acre. These wetlands would be filled as part of the roadway embankment construction and expansion of the box culvert. Impacts to Wetland 61 would be 0.01 acre less than Alternatives 1 and 2. Wetland functions are the same as described under Alternative 1.

Isolated Irrigation Ditches in Uplands. Alternative 3 would have more impacts (0.08 acre) to nonjurisdictional wetlands associated with isolated irrigation ditches in upland areas (Wetlands 60, 64, 69, and 70). These wetlands do not have any high- or moderate-rated wetland functions.

Other Waters. There would be approximately 0.15 acre of permanent impacts to other waters, including 0.09 acre of impact to Paxton Ditch and 0.06 acre of impact to intermittent stream O-8. Paxton Ditch is nonjurisdictional.

3.3.3 Section 404(b)(1) Guidelines Analysis

Prior to issuing a Section 404 Permit authorizing the placement of dredged or fill material into waters of the United States, the proposed project must be evaluated by the Corps to determine its compliance with Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 Code of Federal Regulations [CFR] Part 230). The guidelines state that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which will have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences." The Guidelines define the aquatic ecosystem as "waters of the United States, including wetlands, that serve as habitat for interrelated and interacting communities and populations of plants and animals." Table 3.3-5 provides a summary of the impacts to the aquatic ecosystem by alternative.

Table 3.3-5
Impacts to the Aquatic Ecosystem for Section 404(b)(1) Analysis

Resource	Impacts to the Aquatic Ecosystem by Alternative (acres)			
	No Action	Alternative 1	Alternative 2	Alternative 3
Jurisdictional Wetlands	0.00	1.14	1.14	1.17
Jurisdictional Other Waters	0.00	0.03	0.03	0.06
Total	**0.00**	**1.17**	**1.17**	**1.23**

Note: These numbers represent jurisdictional wetlands and other waters, whereas the alternative descriptions also included nonjurisdictional wetlands and other waters.

The NEPA process requires only that "reasonable" alternatives be considered, and defines this as "feasible and such feasibility must focus on the accomplishment of the underlying purpose and need (of the applicant or the public) that will be satisfied by the proposed Federal Action" (Schwartz 1999). Per the Corps guidelines, the definition of "practicable" is more restrictive than "reasonable" and is defined as "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose." Thus it is possible that an alternative can be considered "reasonable" by the NEPA guidance, but not "practicable" by the Corps guidelines.

As shown in Table 3.3-5, Alternative 2 would result in the same impact as described under Alternative 1, but less than Alternative 3 (1.23 acres). Alternatives 1 and 2 appears to be the least damaging practicable alternative to the aquatic ecosystem per the Corps guidelines; however, when all of the other environmental consequences and purpose and need are taken into consideration Alternative 2 is preferred. Alternative 2 is preferred over Alternative 1 because it has fewer impacts to threatened and endangered species habitat and would better meet the safety component of the purpose and need; Alternative 2 is preferred over Alternative 3 because it would have fewer impacts to the aquatic environment and to wildlife habitat, Tribal lands, endangered and threatened species habitat, and National Register of Historic Places (NRHP) eligible sites.

3.3.4 Mitigation Measures (Preferred Alternative)

Issue W-1: The Preferred Alternative would permanently impact 2.67 acres of wetlands and 0.28 acre of other waters, including 1.14 acres of jurisdictional wetlands.

Mitigation Measure W-1: Unavoidable permanent impacts will be mitigated through on-site and/or off-site wetland creation or restoration, in accordance with CDOT policy, current Federal Highway Administration (FHWA) wetland mitigation policy (23 CFR 777), current Corps mitigation policies, and the conditions of the Corps Section 404 Permit. Although the CWA only requires compensatory mitigation for those wetlands and other waters considered jurisdictional by the Corps, it is CDOT policy to mitigate all wetlands impacts (jurisdictional and nonjurisdictional) at a 1:1 ratio. Based on a functional assessment methodology, the Corps will determine the appropriate level of mitigation based upon the functions lost or adversely affected as a result of impacts to aquatic resources.

The overall goals of compensatory mitigation will be to replace the acreage of wetlands that will be permanently impacted by the project, to replace the wetland functions that will be lost. In addition, mitigation will follow an ecosystem approach and include a mix of habitats, and will be within the same watershed as the impacted wetlands. Mitigation for non-wetland waters of the United States and for riparian habitat will be included.

Five new, potential, on-site wetland mitigation areas have been identified. One of them (Animas River Terrace) is relatively large and can be used to mitigate all of the project impacts, if necessary, and also provides a location for riparian habitat mitigation. The other four sites are smaller and address specific impacts. All of the potential mitigation areas are in upland or primarily upland areas, and wetland mitigation will primarily consist of wetland creation. Final selection of sites and construction methods will depend on various factors such as the areas required, land availability, hydrology, engineering feasibility, wetland functions that can be achieved, and the surrounding habitats and relative importance in the ecological landscape. CDOT will obtain easements or other legal protection of the selected mitigation areas.

Effectiveness: The compensatory mitigation described would replace the area and functions of wetlands impacted by the project, and would also replace impacted riparian habitat.

3.3.5 Residual Adverse Impacts

Approximately 2.67 acres of existing wetlands and 0.28 acres of other waters would be removed during construction. Wetland functions would be lost until the compensatory mitigation wetlands are successful and reestablish those functions, which may take several years.

3.4 THREATENED, ENDANGERED, AND SENSITIVE SPECIES

Special status species are animals and plants that are listed as threatened, endangered, proposed, or candidate by federal and/or state agencies. Other special status species are those listed by CDOW as special concern and species considered rare or vulnerable by Colorado Natural Heritage Program (CNHP). Threatened and endangered species are protected under the Endangered Species Act (ESA) or Colorado state law, while sensitive species receive no formal protection but are still considered when assessing impacts. Letters from CNHP and US Fish and Wildlife Service (USFWS) listing special status species likely to occur in La Plata County are included in the Biological Assessment, which is provided as Appendix G and Appendix I, *Interagency Correspondence*.

3.4.1 Affected Environment

Surveys of special status species were conducted in May and June of 1999 and 2001. Additional information was gathered through literature investigations and discussions with USFWS personnel.

Federal- and State-Listed Threatened, Endangered, and Candidate Species

Species listed by USFWS and the State of Colorado are shown in Table 3.4-1. Species known or likely to occur within the US 550 project area, or that may be affected indirectly by project activities, are described in more detail below. A number of species lack suitable habitat, or are otherwise unlikely to occur and are not discussed further, including the Mexican spotted owl, Gunnison sage grouse, Canada lynx, river otter, wolverine, black-footed ferret, boreal toad, Uncompahgre fritillary butterfly, Mancos milkvetch, Mesa Verde cactus, and sleeping Ute milkvetch.

Table 3.4-1
Threatened, Endangered, and Candidate Species in the US 550 Study Area

Common Name	Scientific Name	Status	Occurrence
Animals, Birds, Amphibians, and Insects			
Bald eagle	*Haliaeetus leucocephalus*	FT, ST	Present in study area in winter. CDOT identified one bald eagle nest approximately 1.2-miles from the study area (CDOT 2004).
Mexican spotted owl	*Strix occidentalis lucida*	FT, ST	Unlikely; marginal winter habitat. Nearest known nesting in Mesa Verde.
Western burrowing owl	*Athene cunicularia hypugaea*	ST	Potentially present in association with prairie dog colonies. None observed.
Gunnison sage grouse	*Centrocercus minimus*	FC	Not present; not in current range.
Southwestern willow flycatcher	*Empidonax traillii extimus*	FE, SE	Possible during migration and summer. Several small patches of suitable habitat. Not observed in field surveys.
Yellow-billed cuckoo	*Coccyzus americanus*	FC, SE	Unlikely; potential habitat is present along Animas River in project vicinity.
Canada lynx	*Lynx Canadensis*	FT	Not present; no suitable habitat.
River otter	*Lutra canadensis*	SE	Unlikely; nearest known populations on Animas River north of Durango and upper Florida and Los Pinos Rivers.
Wolverine	*Gulo gulo*	SE	Not present; no suitable habitat. May be extinct in Colorado.
Black-footed ferret	*Mustela nigripes*	FE, SE	Not present; no suitable habitat as no prairie dog colonies of sufficient size to support the species.
Colorado pikeminnow	*Ptychocheilus lucius*	FE, ST	Not present in study area, but present downstream.
Razorback sucker	*Xyrauchen texanus*	FE, SE	Not present in study area, but present downstream.
Boreal toad	*Bufo boreas boreas*	FC, SE	Not present; no suitable habitat.
Uncompahgre fritillary butterfly	*Boloria acrocnema*	FE	Not present; no suitable habitat.

Common Name	Scientific Name	Status	Occurrence
Plants			
Knowlton's cactus	*Pediocactus knowltonii*	FE	Not present; suitable habitat present but not observed during field surveys.
Mancos milkvetch	*Astragalus humillimus*	FE	Not present; no suitable habitat.
Mesa Verde cactus	*Sclerocactus mesae-verdae*	FT	Not present; no suitable habitat.
Sleeping Ute milkvetch	*Astragalus tortipes*	FC	Not present; no suitable habitat.

Status: FC = candidate for listing by federal government; FE = listed as endangered by federal government; FT = listed as threatened by federal government; SE = listed as endangered by State of Colorado; ST = listed as threatened by State of Colorado

Bald Eagle

The bald eagle occupies Colorado's western valleys, mountain parks, and eastern plains in winter, and is a rare summer resident. Bald eagles forage on rivers, large lakes and reservoirs, estuaries, and coastal habitats, and individuals require large trees or cliffs for roosting and perching. Bald eagles mainly subsist on fish and carrion, but also prey on waterfowl and mammals opportunistically (Andrews and Righter 1992).

Historically, bald eagles were numerous during the winter along the Animas River corridor (Hayden 2003). More recently, bald eagles are occasionally observed in the study area and may periodically utilize the Animas River near its confluence with the Florida River in the winter (Craig 2001). No known bald eagle roosting or nesting sites are known to occur within one mile of the study area; however, one active nest occurs approximately 1.2 miles west of the study area near the Animas River (CDOT 2004). The line of sight from this nest is obscured by dense woodland and is located downhill from the proposed construction footprint. The Animas River corridor was historically heavily used by bald eagles; however, currently only individual bald eagles are likely to utilize the Animas River near its confluence with the Florida River (south of Bondad Hill near MP 3) (Craig 2001a).

Western Burrowing Owl

Western burrowing owls nest underground, generally in abandoned prairie dog burrows, although they also nest in ground squirrel burrows in grasslands and sagebrush and saltbush shrublands. Several small Gunnison's prairie dog colonies occur in the US 550 study area that would provide suitable nesting habitat for burrowing owls, although the species was not observed during field surveys (Sugnet 2003b).

Southwestern Willow Flycatcher

Southwestern willow flycatchers nest in riparian thickets in the foothills and willow-dominated open valleys. The species prefers willow patches with multiple shrub height near water with abundant insects (Kingery 1998; Andrews and Righter 1992). Several patches of suitable habitat for the southwestern willow flycatcher exist in the study area; however, none were observed during surveys (Sugnet 2003b). Several observations of the species during breeding season are known to exist near Bayfield, northeast of the US 550 study area (Sugnet 2003b).

USFWS has defined the minimum patch size dimensions for willow carrs capable of supporting nesting southwestern willow flycatchers as 30 feet in width and length and 6 feet in height. However, linear patches wider than 15 feet that cover at least 900 square feet should also be considered potential habitat for southwestern willow flycatchers (Sugnet 2003b, citing Ireland 2001). Four areas within the study area are dominated by, or contain, willow and are potentially capable of supporting southwestern willow flycatcher (Sugnet 2003c).

Southwestern willow flycatcher call-back surveys of suitable patches of habitat were conducted on June 5, 15, 22, and July 8 and 13, 2002. No southwestern willow flycatchers were identified during 2002 surveys. Additional willow patches are located between MPs 0 and 3; however, no willow patches occur in areas that would be directly impacted by construction activities.

Yellow-billed Cuckoo

Yellow-billed cuckoos breed in large areas of lowland, riparian cottonwood-willow habitats, and urban areas with tall trees (Andrews and Righter 1992). The subspecies requires suitable habitat patches of at least 35 acres of dense riparian forest with a 50 percent canopy cover (Brown et al. 1999). Populations in the western United States have declined due mainly to habitat loss in breeding areas.

Yellow-billed cuckoo historically occurred in the vicinity of the US 550 study area (Andrews and Righter 1992; CNHP 2003); however, the species is not known to currently nest in the US 550 corridor (Kingery 1998). Habitat for yellow-billed cuckoos occurs in the cottonwood riparian forest along portions of the Animas River, with the most suitable habitat west of the study area below Sunnyside Mesa, approximately ¾-mile from the study area. No yellow-billed cuckoos were observed during site visits.

Colorado Pikeminnow

Colorado pikeminnow are long-lived, large-river fish that utilize a variety of substrates, depths, and velocities. During spring and early summer, adult fish use areas inundated by spring flooding. Spring inundation of lowlands is believed to be important to the overall health of this species. An extant population of Colorado pikeminnow is present in the San Juan River, and critical habitat has been designated by USFWS from the downstream reaches of the San Juan River to its confluence with the Animas River. However, no potential Colorado pikeminnow habitat is present in the Animas River adjacent to the project area (Japhet 2001).

Razorback Sucker

Adult razorback sucker habitat use varies depending on season and location. Adult razorback suckers are adapted for swimming in swift currents, but they may also be found in eddies and backwaters away from the mainstream and river currents (Allan and Roden 1978). The current distribution of razorback suckers in the upper basin is confined to small groups of fish in several widely distributed locations. Most fish occur in the lower 4 miles of the Yampa River and the Green River from the mouth of the Yampa River downstream to the confluence of the Duchesne River (USFWS 1997). Critical habitat for the Razorback sucker occurs downstream of the Animas River at its

confluence with the San Juan River. Small populations may also occur in the Colorado River at Grand Valley, and in the San Juan River upstream from Lake Powell to its confluence with the Animas River. However, no potential razorback sucker habitat is present in the Animas River adjacent to the project area (Japhet 2001).

Knowlton Cactus

Knowlton cactus grows on tertiary alluvial deposits overlying the San Jose Formation. These deposits form rolling, gravelly hills that are vegetated with piñon pine, Rocky Mountain juniper, and big sagebrush (Sugnet 2003b). The only known Knowlton cactus population is located on a hill near the Los Pinos River, along the Colorado-New Mexico border. Suitable habitat exists within the study area; however, no Knowlton cactus was observed during the 1999 field surveys.

Other Special Status Species

Other species that have special status are listed by the State of Colorado as special concern or by CNHP as rare or imperiled. These species and their potential to occur in the US 550 study area are shown in Table 3.4-2. Species known or likely to occur, or that may be affected indirectly by project activities, are described in more detail below. A number of species lack suitable habitat, or are otherwise unlikely to occur and are not discussed further, including Great Basin silverspot butterfly, Arboles milkvetch, Aztec milkvetch, green sedge, Philadelphia fleabane, and wood lily.

Table 3.4-2
Sensitive Species Occurrence in the US 550 Study Area

Species	Scientific Name	Status	Occurrence in US 550 Study Area
Animal Species			
American peregrine falcon	*Falco peregrinus anatum*	SC	No suitable nesting habitat, but foraging habitat is present and active nests are located west of Animas River.
Ferruginous hawk	*Buteo regalis*	SC	Possible as rare winter resident.
Northern harrier	*Circus cyanus*	S3	Present; suitable habitat in project area and within known range.
Gray vireo	*Vireo vicinior*	S2	Likely present; suitable habitat and previous records, however, none detected during field surveys.
Brazilian free-tailed bat	*Tadarida braziliensis*	S1	Potentially present while foraging.
Townsend's big-eared bat (pale ssp.)	*Corynorhinus townsendii pallescens*	SC	Potentially present while foraging.
Northern leopard frog	*Rana pipiens*	SC	Possible; suitable habitat present within and adjacent to the study area.
Roundtail chub	*Gila robusta*	SC	Present; known populations in the Animas River (Japhet 2003b).
Great Basin silverspot butterfly	*Speyeria nokomis Nokomis*	S1	Not present; no large violet patches observed in study area.
Plant Species			
Abajo penstemon	*Penstemon lentus*	S2	Possible; suitable habitat; none detected during field surveys.

Species	Scientific Name	Status	Occurrence in US 550 Study Area
Arboles milkvetch	*Astragalus oocalysis*	G4, S2, S3	Unlikely; no seleniferous clay soils in project area; none detected during field surveys.
Aztec milkvetch	*Astragalus proximus*	G4, S2	Unlikely; no recent records in vicinity and none detected during field surveys.
Green sedge	*Carex viridula (C. oederi spp viridula)*	G5, S1	Not present; no fens in study area and below elevation range for species.
Missouri milkvetch	*Astragalus missouriensis var. Humistratus*	S1	Possible; observed in study area in 1963; no recent observations in vicinity and none detected during field surveys.
Pagosa phlox	*Phlox caryophylla*	G4, S2	Possible; suitable habitat; none detected during field surveys.
Philadelphia fleabane	*Erigeron philedelphicus*	G5, S1	Unlikely; little suitable habitat and not observed during field surveys.
San Rafael milkvetch	*Astragalus rafaelensis*	G3, S1	Possible; observed in study area in 1963; no recent records and none detected during field surveys.
Wood lily	*Lilium philadelphicum*	G5, S3	Unlikely; little suitable habitat and not observed during field surveys.

Status: SC = Colorado Division of Wildlife Special Concern

Colorado Natural Heritage Program rankings:

G/S1 = Critically imperiled globally/in state because of rarity or some factor of its biology, making it especially vulnerable to extinction

G/S2 = Imperiled globally/in state because of rarity or other factors, making it very vulnerable to extinction

G/S3 = Vulnerable through its range or found locally in a restricted range

G/S4 = Apparently secure globally/in state, though it might be quite rare in parts of its range

G/S5 = Demonstratably secure globally/in state, though it might be quite rare in parts of its range

Peregrine Falcon

Peregrine falcons nest primarily among cliffs and forage over adjacent coniferous and riparian forests, and to a lesser extent, over other habitats (Andrews and Righter 1992). No known nests occur within the study area; however, active aeries (peregrine falcon nests), located on cliffs or mountaintops, are located west of the Animas River near Perins Peak, as well as east of the study area. Since there is adequate habitat and suitable prey base for peregrine falcons in the study area, it is likely that they may forage in and around the Animas River corridor. The US 550 study area may also occasionally be used as hunting habitat by migrating peregrine falcons.

Ferruginous Hawk

Ferruginous hawks breed and winter in large expanses of flat, relatively unbroken terrain, including semiarid grasslands, with scattered trees, rock outcrops, and tall trees along streams and rivers. The species winters primarily from the central part of the breeding range in Nevada, Colorado, and Kansas south to northern Mexico (Johnsgard 1990). The decline of ferruginous hawk populations is attributed to the loss of large, open tracts of grasslands and desert scrub habitats used for nesting, as well as the increase in agriculture and urban expansion (Schmutz 1984, 1987; Arizona Game and Fish Department [AGFD] 1996).

Of the habitat types primarily found within the study area, wintering ferruginous hawks are most likely to utilize the agricultural areas located in the central portion to prey on rabbits, jackrabbits, and grassland rodents, such as ground squirrels and prairie dogs

(Johnsgard 1990). Ferruginous hawks are considered uncommon in the region and none were identified during raptor nest surveys in 2004 (CDOT 2004). The US 550 study area is not likely to be important wintering habitat for ferruginous hawks.

Northern Harrier

Northern harriers forage over open areas such as marshes, wetlands, grasslands, farm fields and pastures, and road margins. Harriers prey on small- to medium-sized mammals captured in low, open vegetation (Johnsgard 1990). Harriers nest primarily in wet meadows, marshes, grasslands, cultivated fields, and pastures. The northern harrier is distributed throughout North America and Eurasia; however, the species is only a rare or rare to uncommon summer resident in the study area, and is absent during winter months (Johnsgard 1990; Andrews and Righter 1992).

Northern harriers were observed during spring 2000 surveys, foraging over fallow agricultural areas in the central portion of the US 550 study area, though none were observed during summer 2000 surveys. Although northern harriers are generally uncommon in southwestern Colorado, species are likely present during spring and fall migration.

Gray Vireo

In southern Utah and Colorado, the gray vireo is found in scattered in piñons, junipers, and dry brushland (Bailey and Niedrach 1965; Hayward et al. 1976); in western Colorado, pairs nest primarily in juniper trees. The majority of gray vireo breeding populations are found in southern Nevada, central and northern Arizona, southern Utah, western and southwestern Colorado, and western New Mexico (Barlow et al. 1999).

CNHP has records from 1992 of gray vireo in the vicinity of the US 550 study area between MPs 1 and 4 (CNHP 2003). Piñon-juniper habitat occurs on the east and west sides of US 550 in the study area. In addition, suitable piñon-juniper woodland habitat occurs at other locations in the study area, including the majority of Alternative 2, east of Bondad Hill from MPs 4.75 to 7.5 and MPs 13.75 to 15.75. No nesting records or recent observations of the gray vireo have been recorded in or adjacent to the study area (CNHP 2003; Kingery 1998), though the distribution of the species has not been well studied (Andrews and Righter 1992). Therefore, the gray vireo may occur in the US 550 study area.

Brazilian Free-tailed Bat

The Brazilian free-tailed bat predominantly occurs at lower elevations (below 6,000 feet) in piñon-juniper woodlands, desert grasslands, and semidesert shrublands; however, they are known to forage in higher elevation habitats (Fitzgerald et al. 1994). The species usually roosts in secure, properly ventilated areas such as caves and caverns (e.g., Carlsbad Caverns, New Mexico) and may be found in numbers as high as 10 to 20 million per roost site (Hoffmeister 1986).

No Brazilian free-tailed bat roosting or breeding habitat is present within the limits of the study area, thus, roosting and breeding site surveys were not conducted for this project.

Brazilian free-tailed bats forage up to 30 miles from a roosting site, therefore in the study area the species may potentially forage at:

- MPs 3.75 to 4.75, in fragmented sagebrush scrubland areas, and
- MPs 4.75 to 7.5 and MPs 13.75 to 15.75, in disturbed and undisturbed areas of piñon-juniper woodlands.

Townsend's Big-eared Bat

Townsend's big-eared bats occupy habitats similar to the Brazilian free-tailed bat. The species utilizes caves, cliffs, and rock fissures for roosting and does not fly far from day roosts to forage (Fitzgerald et al. 1994). Townsend's big-eared bats may utilize the study area for foraging, but no roosting or hibernacula sites are known to occur in the study area.

Northern Leopard Frog

The northern leopard frog typically inhabits the banks and shallow areas of marshes, ponds, and streams, but may also occur in irrigation ditches and wet meadows (Hammerson 1999). Leopard frogs are usually observed near permanent water; however, they can and do, at times, roam far from water on rainy nights (Hammerson 1999). Emergent or submergent vegetation such as bulrushes (*Scirpus* spp.) or cattails (*Typha* spp.) are typical components of occupied habitat and are probably necessary for cover and egg placement. Adjacent moist upland or wetland soils, with a dense cover of grass or forbs and a canopy of cottonwoods (*Populus* spp.) or willows (*Salix* spp.), are also important components of leopard frog habitat.

Potential northern leopard frog habitat is located at the following locations:

- MP 2.75, in wetland habitat created as a wetland mitigation site
- MP 3.25, in wetland habitat associated with Deer Creek on the west side of US 550;
- MP 3.75, in wetland habitat located directly west of the Animas River Bridge and US 550; and
- MPs 14.25 to 14.5, in wetlands supported by an irrigation ditch, west of US 550.

Roundtail Chub

The roundtail chub is a large river fish, which occupies slow-moving waters adjacent to areas of faster water. Young roundtail chub inhabit shallow river runs while juveniles prefer river eddies and irrigation ditches (NDIS 2004). Historically, the species was common in the Colorado River Basin to tributaries in the foothills. In Colorado, roundtail chub are found in the mainstem of the Colorado River and its larger tributaries, including the San Juan River.

Southern Ute Indian Tribe (SUIT) biologists recently conducted a survey of the Animas River and found low numbers of roundtail chubs near the US 550 Bridge crossing over the Animas River near MP 3.75 (Sugnet 2003b, citing Japhet 2001; SUIT DOW 2003).

Abajo Penstemon

Abajo penstemon inhabits dry clayey or adobe soils of hills and mesas (Harrington 1954) and is associated with juniper, piñon pine-juniper woodland, mountain mahogany (*Cercocarpus* spp.), milkvetch (*Astragalus* spp.), and bluegrass (*Poa* spp.) (Button 1986). The blooming period of Abajo penstemon is from late May to June (Bureau of Land Management [BLM] 1995). Locations of clay soils that are associated with the plant communities listed above constitute potentially suitable habitat areas for this plant species.

Piñon -juniper woodlands are present east of US 550 at Bondad Hill and west from MPs 6.75 to 7.5, and MPs 13.75 to 15.75. Abajo penstemon may occur in the US 550 study area; however, no individuals were observed during surveys conducted in the 2001 season.

Missouri Milkvetch

Missouri milkvetch inhabits flat shale meadows and shallow slopes, roadsides, and other disturbed areas. In Colorado, the only documented occurrences are in Archuleta and La Plata counties (CNHP 2001). One observation of this species was recorded in 1963 near MPs 15 to 16 in the northern portion of the study area. Suitable habitat is present within the project area; however, no individuals were observed during 1999 surveys. Missouri milkvetch was not observed during floral surveys and there are no recent observations for the species in the area. Although the species was not detected during floral surveys and there are no recent observations for the species in or near the study area, its occurrence is possible in the study area.

Pagosa Phlox

Pagosa phlox grows in open woods, slopes, and sagebrush communities, often in deep soils at elevations ranging from 6,500 to 7,500 feet. It is distributed in Rio Arriba and Taos counties, New Mexico, and La Plata and Archuleta counties, Colorado. This species is a perennial, has narrow leaves, and flowers that are bright pink and bloom from May to July (Sugnet 2003b, citing BLM 1995). Suitable habitat is present for Pagosa phlox near or adjacent to the US 550 alignment in areas of undisturbed sagebrush scrub between MPs 3.75 and 4.75 and between MPs 5.75 and 7.5. However, Pagosa phlox was not detected during floral surveys conducted during the spring of 2000.

San Rafael Milkvetch

San Rafael milkvetch inhabits gullied hills, washes, and talus under cliffs in seleniferous, clayey, silty, or sandy soils. The species is found at elevations from 4,400 to 6,500 feet (Spackman et al. 1997). San Rafael milkvetch was observed south of Bondad Hill between MPs 4 and 5 near US 550 in 1963 (CNHP 2003). A small amount of suitable habitat is present within the study area; however, no individuals were observed. Although the species was not detected during floral surveys and there are no recent observations for the species in or near the study area, its occurrence is possible in the study area.

3.4.2 Environmental Consequences

Impacts Specific to No Action

The No Action Alternative involves no changes to the existing alignment of US 550. Similar to Alternatives 1, 2, and 3, increased traffic would increase the potential for vehicle collisions with wildlife. Without the wildlife underpass improvements, wider roadway shoulders, and improved sight lines, vehicle collisions with wildlife, including bald eagles, may be greater under the No Action Alternative.

Impacts Common to all Action Alternatives

Impacts to specific species common to all action alternatives are summarized in Table 3.4-3 and are discussed below.

Table 3.4-3
Impacts to Specific Species Common to
All Action Alternatives by Road Segment in Acres

Species Type / Road Segment	Bald Eagle (Riparian)	Southwestern willow flycatcher (willow patches)	Gray Vireo (Piñon-juniper)	Western Burrowing Owl (Gunnison's prairie dog habitat)
MP 0.0 – 3.1	0.04	0.00	0.70	0.00
MP 3.1 – 6.6	0.00*	0.00*	0.00*	0.074
MP 6.6 – 10.5	0.00	0.00	0.79	0.00
MP 10.5 – 15.4	0.47	0.15	0.69	0.013
Total	**0.51**	**0.15**	**2.18**	**0.087**

*See impacts to specific alternatives

Federal and State-Listed Threatened, Endangered, and Candidate Species

Bald Eagle

The bald eagle occurs within the study area in small numbers. Disturbance to bald eagles from construction of US 550 may affect bald eagles wintering in the study area through temporary disturbances to individuals; however, implementation of the project would not affect population size or change overall distribution of wintering bald eagles in the region. If individuals nest within 0.5-mile of the study area, construction activities would cause adverse impacts to nesting individuals and young through increased stress that may result in nest abandonment. Additionally, removal of 0.51 acre of mature riparian cottonwood (*Populus* sp.) habitat for construction and roadway widening would reduce the number of roosting opportunities for bald eagles along the Animas River. Direct impacts to 0.087 acre of Gunnison's prairie dog habitat would reduce foraging opportunities within the study area.

Western Burrowing Owl

Burrowing owls may occur in association with prairie dog colonies located in the study area, and construction of US 550 may impact nesting burrowing owls, if present, between March and October from disturbance associated with noise and activity. While no prairie dog burrows are located inside the current construction footprint, disturbance to burrowing owls during the breeding season (April 1 through October 31), if present, may stress the species resulting in nest abandonment and a violation of the MBTA. If construction vehicles disturb burrows and burrowing owls are present, they would be susceptible to being buried or killed in their holes. If present during the nesting season, impacts to burrowing owls may include:

- Permanent loss of potential nesting and foraging habitat,
- Short-term displacement due to construction, and
- Nest abandonment from burrows located adjacent to the current construction footprint.

Impact to prairie dog colonies potentially supporting burrowing owl in the study area under any of the alternatives is 0.087 acre.

Southwestern Willow Flycatcher

Four areas of potentially suitable nesting habitat for southwestern willow flycatcher (Sugnet 2003c) occur in the study area. Impacts to each survey area are described as follows.

- Survey Area 1 is a complex of two linear patches located on the west side of US 550, at the intersection with County Road (CR) 213 (La Posta Road) at approximately MP 3.25. The survey area is dominated by sandbar willow (*Salix exigua*), with each patch measuring up to 30 feet in width. These patches are located within 100 feet from the ROW but would not be removed during construction.
- Survey Area 2 consists of two large patches, located on the south bank of the Animas River, immediately west of the US 550 bridge overpass, near MP 3.75. The area is dominated by willow species (*Salix* spp. including *S. exigua*) and cottonwood (*Populus* spp.). These patches would not be removed for construction; however, construction would occur directly adjacent to these patches for the bridge crossing over the Animas River.
- Survey Area 3 is located at approximately MP 14.25, on the east side of US 550, along the Co-Op Ditch. The patch is dominated by sandbar willow and measures up to 30 feet in width and is supported by an irrigation ditch. This patch would be removed for construction.
- Survey Area 4 consists of two linear willow patches located at approximately MP 14.5, on the west side of US 550 along the Co-Op Ditch. Portions of these patches would be disturbed and removed for construction.

Because several areas of willow habitat (approximately 0.15 acre) would be removed by construction activities, implementing any of the action alternatives may affect southwestern willow flycatchers in the study area. Additionally, the close proximity of

the roadway to the remaining suitable habitat areas may disrupt breeding activities in these suitable habitat areas due to the affects of dust, noise, and human disturbance associated with construction activities. Although no southwestern willow flycatchers were present in the 2002 survey season, the species could occupy suitable habitat in the area in the future (prior to construction). Additionally, the removal of 0.15 acre of suitable nesting habitat for construction activities and roadway widening would reduce nesting opportunities for southwestern willow flycatchers.

Yellow-billed Cuckoo

Since suitable habitat is not located directly within the US 550 study area, the project would likely have no effect on the yellow-billed cuckoo.

Colorado Pikeminnow and Razorback Sucker

Water requirements for construction activities are anticipated to cause a depletion to the Animas or Florida River of 62.78 average annual acre-feet based on 3-year construction duration. Although any depletion would have some detrimental affect to the Colorado pikeminnow and razorback sucker inhabiting waters downstream in the San Juan River Basin, the 62.78 acre-feet depletion associated with this project fits within the depletion limits established by a 1999 Biological Opinion issued by USFWS.

On May 21, 1999, USFWS issued a Biological Opinion determining that depletions of 100 acre-feet or less in the San Juan River Basin would not limit the provision of flows identified for the recovery of the Colorado pikeminnow and razorback sucker and, thus, not be likely to jeopardize the endangered fish species or result in the destruction or adverse modifications of their critical habitat. This Biological Opinion relies heavily on the Recovery Implementation Program (RIP) for Endangered Fish Species in the San Juan River Basin was initiated in October 1992. The RIP was intended to provide mitigation and be the reasonable and prudent alternative to avoid jeopardy to the endangered fishes by depletions from the San Juan River. Provided that the RIP continues to be implemented and provide the flows identified for recovery in a timely manner, the action alternatives are not anticipated to have an adverse affect on populations of Colorado pikeminnow and razorback sucker.

Knowlton Cactus

The project is unlikely to affect Knowlton cactus, as no populations are known to occur in the US 550 study area; however, suitable habitat for Knowlton cactus exists in the study area. Since construction activities are unlikely to begin for several growing seasons, there is a possibility that construction activities may affect Knowlton cactus.

Other Special Status Species

Peregrine Falcon

No observations of peregrine falcons have been recorded either directly adjacent to or within the study area limits (Craig 2001a). Although the species nests in cliff habitats adjacent to the study area, impacts to this species should not occur as a result of the proposed US 550 expansion as cliff habitat does not occur within 0.5-mile of the study

area. However, nests are located adjacent to the study area and individuals would be impacted by project construction activities through visual and auditory disturbances while foraging.

Ferruginous Hawk

Construction and the resulting expansion of US 550 is not expected to impact wintering ferruginous hawks in the US 550 study area.

Northern Harrier

Impacts to northern harriers are unlikely since the species is migratory in the area.

Gray Vireo

Gray vireos are expected to occur in the study area and may be impacted by construction activities. An estimated 2.18 acres of gray vireo nesting habitat would be impacted by construction activities for any of the action alternatives (Table 3.4-3).

Northern Leopard Frog

Disturbance or destruction of 2.13 acres of wetland habitat for construction of any of the action alternatives may have minor impacts to northern leopard frogs, if present in the US 550 study area, through loss of habitat or mortality to individuals present in the construction ROW. Wetlands affected by construction would be replaced by new wetlands, in accordance with mitigation requirements under the CWA (see wetland section). Thus, habitat impacts would be temporary and are unlikely to adversely affect populations of the northern leopard frogs.

Brazilian Free-Tailed Bat and Townsend's Big-eared Bat

Implementation of any of the action alternatives would have adverse impacts to foraging activities for these species but is not expected to alter population levels of either bat species.

Roundtail Chub

Bridge construction activity at this location requiring in-channel work or riverbank augmentations may cause short-term and temporary adverse impacts to roundtail chubs at that location and downstream. However, roundtail chubs would experience benefits from Animas River Bridge reconstruction as the piers would be removed from the channel and new piers constructed on the banks. This would allow unobstructed movement for roundtail chubs in the Animas River in that location.

Abajo penstemon, Missouri milkvetch, Pagosa phlox, and San Rafael milkvetch

These species are not known to occur, but the study area includes suitable habitat and is within their known range. In addition, there are historic records for two of the species. Clearing, grading, and other earth-moving activities would destroy any individuals or populations present within the construction area, and would disperse or bury soil seed banks. The area within the construction limits represents a very small portion of the potential habitat for these species, and impacts are unlikely to adversely affect the overall abundance and distribution of the species.

Impacts Specific to Alternative 1

Federal and State-Listed Threatened, Endangered, and Candidate Species

Bald Eagle

In addition to those impacts described under Impacts Common to All Action Alternatives, Alternative 1 would impact an additional 2.02 acres of bald eagle habitat. As a result, the total impact to bald eagle habitat would be 2.53 acres. Impacts to Gunnison's prairie dog habitat would not differ by alternative. Table 3.4-4 shows impacts to bald eagle habitat and other affected federal and state-listed threatened, endangered and candidate species' habitat by alternative.

Table 3.4-4
Total Impacts Specific to Each Action Alternative

Species	Total Habitat Impacts Specific to Alternative 1 (acres/type)	Total Habitat Impacts Specific to Alternative 2 (acres/type)	Total Habitat Impacts Specific to Alternative 3 (acres/type)
Bald eagle	2.53/riparian; 0.087/prairie dog	2.56/riparian; 0.087/prairie dog	2.58/riparian; 0.087/prairie dog
Southwestern Willow Flycatcher	0.48/willow patches	0.47/willow patches	0.47/willow patches
Gray Vireo	29.22/Piñon-juniper	31.48/Piñon-juniper	51.99/Piñon-juniper
Northern leopard Frog	2.70/wetland	2.67/wetland	2.74/wetland
Western Burrowing Owl	0.087/prairie dog	0.087/prairie dog	0.087/prairie dog

Western Burrowing Owl

Alternative 1 would not have impacts to western burrowing owl beyond those discussed that are common to all action alternatives.

Southwestern Willow Flycatcher

In addition to those impacts described under Impacts Common to All Action Alternatives, Alternative 1 would impact an additional 0.33 acre of southwestern willow flycatcher habitat as described below.

- Survey Area 2 consists of two large patches, located on the south bank of the Animas River, immediately west of the US 550 bridge overpass, near MP 3.75. The area is dominated by willow species (*Salix* spp. including *S. exigua*) and cottonwood (*Populus* spp.). These patches would not be removed for construction; however, construction would occur directly adjacent to these patches for the bridge crossing over the Animas River. (Sugnet 2003c)

As a result, the total impact to southwestern willow flycatcher habitat would be 0.48 acre (Table 3.4-4).

Colorado Pikeminnow and Razorback Sucker

Alternative 1 would not have impacts to Colorado pikeminnow and razorback sucker beyond those discussed that are common to all action alternatives.

Knowlton Cactus

Alternative 1 would not have impacts to Knowlton cactus beyond those discussed that are common to all action alternatives.

Other Special Status Species

Peregrine Falcon, Ferruginous Hawk, Northern Harrier, Brazilian Free-Tailed Bat, Townsend's Big-Eared Bat, Roundtail Chub, Abajo Penstemon, Missouri Milkvetch, Pagosa Phlox, and San Rafael Milkvetch

Alternative 1 would not have anticipated impacts to these species beyond those discussed that are common to all action alternatives.

Gray Vireo

In addition to those impacts described under Impacts Common to All Action Alternatives, Alternative 1 would impact an additional 27.04 acres of Gray vireo habitat for a total impact of 29.22 acres (Table 3.4-4).

Northern Leopard Frog

In addition to those impacts described under Impacts Common to All Action Alternatives, Alternative 1 would impact an additional 0.59 acre of northern leopard frog habitat. As a result, the total temporary impact to northern leopard frog habitat would be 2.70 acres (these wetlands would be replaced in accordance with mitigation requirements under the CWA).

Impacts Specific to Alternative 2 (Preferred Alternative)

Federal and State-Listed Threatened, Endangered, and Candidate Species

Bald Eagle

In addition to those impacts described under Impacts Common to All Action Alternatives, Alternative 2 would impact an additional 2.05 acres of bald eagle habitat. As a result, the total impact to bald eagle habitat would be 2.56 acres (Table 3.4-4).

Western Burrowing Owl

Alternative 2 would not have impacts to western burrowing owl beyond those discussed that are common to all action alternatives.

Southwestern Willow Flycatcher

Impacts to southwestern willow flycatcher would be similar to those described under Alternative 1, with 0.01 acres less impact to habitat. Overall impacts associated with Alternative 2 would be 0.47 acre (Table 3.4-4).

Colorado Pikeminnow and Razorback Sucker

Alternative 2 would not have impacts to Colorado pikeminnow and razorback sucker beyond those discussed that are common to all action alternatives.

Knowlton Cactus

Alternative 2 would not have impacts to Knowlton cactus beyond those discussed that are common to all action alternatives.

Other Special Status Species

Peregrine Falcon, Ferruginous Hawk, Northern Harrier, Brazilian Free-Tailed Bat, Townsend's Big-Eared Bat, Roundtail Chub, Abajo Penstemon, Missouri Milkvetch, Pagosa Phlox, and San Rafael Milkvetch

Alternative 2 would not have anticipated impacts to these species beyond those discussed that are common to all action alternatives.

Gray Vireo

In addition to those impacts described under Impacts Common to All Action Alternatives, Alternative 2 would impact an additional 29.30 acres of Gray vireo habitat for a total impact of 31.48 acres (Table 3.4-4).

Northern Leopard Frog

In addition to those impacts described under Impacts Common to All Action Alternatives, Alternative 2 would impact an additional 0.58 acre of northern leopard frog habitat. As a result, the total temporary impact to northern leopard frog habitat would be 2.67 acres (Table 3.4-4) (these wetlands would be replaced in accordance with mitigation requirements under the CWA).

Impacts Specific to Alternative 3

Federal and State-Listed Threatened, Endangered, and Candidate Species

Bald Eagle

In addition to those impacts described under Impacts Common to All Action Alternatives, Alternative 3 would impact an additional 2.07 acres of Bald Eagle habitat. As a result, the total impact to bald eagle habitat would be 2.58 acres (Table 3.4-4).

Western Burrowing Owl

Alternative 3 would not have impacts to western burrowing owl beyond those discussed that are common to all action alternatives.

Southwestern Willow Flycatcher

Impacts to southwestern willow flycatcher would be the same under Alternative 3 as those described under Alternative 2 (Table 3.4-4).

Colorado Pikeminnow and Razorback Sucker

Alternative 3 would not have impacts to Colorado pikeminnow and razorback sucker beyond those discussed that are common to all action alternatives.

Knowlton Cactus

Alternative 3 would not have impacts to Knowlton cactus beyond those discussed that are common to all action alternatives.

Other Special Status Species

Peregrine Falcon, Ferruginous Hawk, Northern Harrier, Brazilian Free-Tailed Bat, Townsend's Big-Eared Bat, Roundtail Chub, Abajo Penstemon, Missouri Milkvetch, Pagosa Phlox, and San Rafael Milkvetch

Alternative 3 would not have anticipated impacts to these species beyond those discussed that are common to all action alternatives.

Gray Vireo

In addition to those impacts described under Impacts Common to All Action Alternatives, Alternative 3 would impact an additional 49.81 acres of Gray vireo habitat for a total impact of 51.99 acres (Table 3.4-4).

Northern Leopard Frog

In addition to those impacts described under Impacts Common to All Action Alternatives, Alternative 3 would impact an additional 0.63 acre of northern leopard frog habitat. As a result, the total temporary impact to northern leopard frog habitat would be 2.74 acres (Table 3.4-4) (these wetlands would be replaced in accordance with mitigation requirements under the CWA).

3.4.3 Mitigation Measures (Preferred Alternative)

The following mitigation actions are recommended for species that may be affected by the proposed US 550 improvements.

Federal and State-Listed Threatened, Endangered, and Candidate Species

The project is unlikely to adversely affect the yellow-billed cuckoo and no mitigations are required.

Bald Eagle

Issue TE-1: The project is expected to have limited adverse effects on bald eagles wintering or nesting within 0.5-mile of the study area due to construction activities causing increased stress during wintering and nesting periods. Removal of mature riparian trees for roadway widening and construction of the Animas River Bridge would reduce the number of roosting opportunities for bald eagles along the Animas River and the loss of 0.087 acre of Gunnison's prairie dog habitat would reduce foraging opportunities within the study area. Additionally, destruction or disturbance of bald or

golden eagle nests or eggs is a violation of the Bald and Golden Eagle Protection Act of 1940 (As amended) 16 USCA 668.

Mitigation Measure TE-1A: Raptor nest surveys will be conducted within 0.5 mile of the construction area prior to starting construction of specific highway segments. If an active or inactive bald eagle nest is identified, a 0.5-mile buffer will be required around the nest, and seasonal restrictions (November 15 to July 31) of no human encroachment will occur within the 0.5-mile radius of the nest.

Mitigation Measure TE-1B: Surveys for nocturnal bald eagle roosts will be conducted prior to starting construction. If a roost is identified, restrict construction activity within 0.25 mile of active nocturnal roost sites between November 15 and March 15.

Mitigation Measure TE-1C: Cottonwood (*Populus* sp.) and other riparian woodland trees removed by construction activities will be replaced at a 2:1 ratio with an appropriate tree species, such as cottonwood (*Populus* sp.).

Effectiveness: The above listed mitigations plus the addition of perch poles listed as mitigation for all birds (see Section 3.2.3), should be effective in preventing adverse effects to key habitat features (if they are found to occur) and should prevent nest abandonment, or disturbance of wintering bald eagles nesting within 0.5-mile of the study area.

Burrowing Owl

Issue TE-2: Should burrowing owls be present in the construction area, there is a potential for loss of nests and mortality of eggs and young.

Mitigation Measure TE-2: Surveys for nesting burrowing owls will be conducted annually and prior to construction between May 1 and July 31 to determine presence or absence in the study area. If burrowing owls are determined to be present in the study area, implement seasonal restrictions will be implemented on construction activities from April 15 through July 15 to avoid impacts to nesting birds. A 225-foot buffer will be required around active nest areas (Craig 2001b).

Effectiveness: The above-listed mitigation measure will prevent loss of nests and mortality of eggs and young.

Southwestern Willow Flycatcher

Issue TE-3: The potential exists for disturbance of breeding Southwestern willow flycatchers and loss of their eggs or young if willow patches are removed during the breeding season. Removal of willow patches suitable for nesting will reduce nesting opportunities.

Mitigation Measure TE-3A: To confirm that no southwestern willow flycatchers are nesting in the study area, additional presence/absence surveys will be conducted one breeding season prior to construction following the most recent survey protocol provided by USFWS. The current USFWS protocol requires presence/absence surveys of willow patches that are 30 feet in diameter and 6 feet high, within 0.25 mile of ROW. These surveys will be conducted during the bird's breeding season, between May 1 and August

15. Buffers will be required during construction around active nest areas or within 0.25 mile of an occupied willow patch (Powell 2003).

Mitigation Measure TE-3B: Willow patches located within the ROW that have potential for supporting breeding southwestern willow flycatchers (those 30 feet in width, length and in height) will be removed before or after the breeding season (i.e., prior to May 1 and after August 15).

Effectiveness: Mitigation measures TE-3A and TE-3B would prevent loss of individual southwestern willow flycatcher and disturbance to eggs and young during construction. Loss of willow patches suitable for nesting would reduce nesting opportunities along the Animas River.

Knowlton Cactus

Issue TE-4: Although no Knowlton cactus are known to currently exist within the ROW, suitable habitat exists and there is the potential for Knowlton cactus to be destroyed by the project because construction may not proceed for several growing seasons.

Mitigation Measure TE-4: Preconstruction presence/absence surveys will be conducted in piñon-juniper and sagebrush habitats between late April and early May. If Knowlton cactus is found within areas scheduled to be impacted, CDOT will consult with USFWS to develop measures to avoid, take, and/or transplant any Knowlton cactus individuals identified.

Effectiveness: Mitigation measure TE-4 would identify Knowlton cactus located within the project area so necessary avoidance and/or mitigation techniques can be implemented to promote the survival of the species.

Other Special Status Species

The project is unlikely to adversely affect special status species, including ferruginous hawk and northern harrier. Foraging activities for peregrine falcon, Brazilian free-tailed bat, and Townsend's big-eared bat may be adversely affected, but no mitigations are required.

Gray Vireo

Issue TE-5: During construction the potential for losses of active gray vireo nests exists.

Mitigation Measure TE-5: Piñon-juniper vegetation in the ROW will be cleared prior to April 1 to prevent gray vireo (and other birds) from nesting within the ROW and avoid take of or disturbance to active nests during breeding season.

Effectiveness: Clearing piñon-juniper vegetation prior to April 1 would prevent gray vireo from nesting within the ROW prior to construction and avoid impacts to active gray vireo nests.

Roundtail Chub

Issue TE-6: During construction of the Animas River Bridge roundtail chubs will be disturbed and adversely impacted by a decrease in water quality caused by an increased sediment load downstream from the construction area.

Mitigation Measure TE-6: Construction activities in the Animas River will take place only during low flows (July to October). If flowing water is present, it will be diverted around active construction areas.

Effectiveness: Mitigation measure TE-6 should minimize impacts to roundtail chub during construction. In addition to mitigation measure TE-6, stormwater best management practices (BMPs) used during construction (which are required by the CWA and CDOT's Stormwater Management Plan) would reduce the potential for downstream impacts to fish from sedimentation and erosion.

Sensitive Plant Species

Issue TE-7: Clearing, grading, and other earth-moving activities have the potential to destroy sensitive plant species located within the construction zone. These species include: Abajo penstemon, Missouri milkvetch, Pagosa phlox, San Rafael milkvetch, Philadelphia fleabance, and wood lily.

Mitigation Measure TE-7: Prior to construction, presence/absence field surveys will be conducted during the flowering season in habitats potentially containing sensitive plants that will be impacted by ROW construction. Soil seed beds of populations that cannot be avoided by construction activities will be transplanted to areas of appropriate soils and vegetation.

Effectiveness: Mitigation measures TE-7 would minimize impacts to individuals and populations of sensitive plant species present within the construction area.

3.4.4 Residual Adverse Impacts

Federal and State-Listed Threatened, Endangered, and Candidate Species

With the mitigations described above, the proposed action would be unlikely to adversely affect bald eagle, western burrowing owl, southwestern willow flycatcher, and Knowlton cactus. The project would have no effect on yellow-billed cuckoo and no mitigations are required. An estimated 2.56 acres of bald eagle roosting habitat would be temporarily impacted from the loss of riparian cottonwood trees until replacement trees reach maturity, and an estimated 0.087 acre of foraging habitat would be lost due to the loss of Gunnison's prairie dog habitat. Western burrowing owls would be affected by the loss of 0.014 acre of potential nesting habitat. Southwestern willow flycatchers would have residual impacts from the loss of 0.47 acre of nesting habitat along the Animas River Corridor. Colorado pikeminnow and razorback sucker would have residual impacts from construction water depletions of 62.78 acre-feet in the San Juan River Basin.

Other Special Status Species

Foraging activities for peregrine falcon, Brazilian free-tailed bat, and Townsend's big-eared bat may be temporarily adversely affected by construction activities. Impacts to foraging activities are not expected to adversely affect populations of these species. The proposed action is unlikely to adversely affect nesting gray vireo, but would cause a net loss of 22.48 acres of nesting habitat. The amount of habitat lost would be small compared to overall areas of available habitat in the surrounding area, but would contribute incrementally to cumulative effects. The proposed action is also unlikely to adversely affect roundtail chub. Northern leopard frogs would have temporary losses of 2.71 acres of habitat and potential direct mortality of individuals during construction. These impacts are not expected to adversely affect populations of northern leopard frogs.

No sensitive plants are currently known to occur in the construction area, and the project is not expected to have adverse impacts. If currently unknown individuals or populations are present, residual impacts may include losses of those individuals or populations if they cannot be avoided. Transplanting of seed banks would not be 100 percent effective and individuals are likely to be lost if they cannot be avoided.

3.5 SOILS AND GEOLOGY

The potential impacts to soils and geology as a result of the US 550 highway improvements project are discussed in this section along with mitigation measures.

3.5.1 Affected Environment

The project area is located within the San Juan Basin, which straddles the Southern Rocky Mountain and the Colorado Plateau Physiographic provinces. The topography in this area consists of mesas, foothills, and valleys with elevations ranging from 6,000 to 8,000 feet above mean sea level. The Animas and Florida rivers are the main drainages in the project area. The surficial geology in the area consists of Upper Cretaceous and Palocene sedimentary rocks and deposits, which are overlain by several soils types. There are approximately 12 soil types and 6 major geologic rock/deposit rock types in the project area, which are described in the following sections.

Soils

Soils in the project area are distributed over varying landforms including foothills, ridges, drainages, floodplains, valley bottoms, low terraces, mesa tops, and sideslopes (USDA SCS [now NRCS] 1982). Twelve soil types found within the project area are described in Table 3.5-1. All descriptions were taken from the *Soil Survey of La Plata County Area, Colorado* (USDA SCS [now NRCS] 1982). These soils are categorized into two general map units.

- **Falfa-Ustic Torriothentus** is the predominant soil type in the project area. In general, these soils are deep, well- to excessively-drained soils found on mesas and breaks.

- **Shalona-Sedillo-Mikim** is typically found along the Animas and Florida rivers in the southern portion of the project area. In general, these soils are well-drained, level to sloping, and found on river terraces and alluvial fans.

Table 3.5-1
Summary of Soil Types, Characteristics, and Uses

Soil Type	Slope (percent)	Erosion Hazard (Runoff)	Uses	Characteristics
Arboles Clay	3 to 12	Moderate	Irrigated field crops (pasture and rangeland)	Deep, well-drained with low soil strength and high-shirk-swell potential.
Dulce-Travessilla-Rock Outcrop Complex	6 to 50	Moderate	Livestock grazing and wildlife habitat	Shallow, well-drained limited by depth to bedrock and steep slopes.
Falfa Clay Loam	1 to 8	Moderate	Irrigated crops, non-irrigated crops, rangeland, homesites	Deep, well-drained with low soil strength and high shrink-swell potential.
Harlan Cobbly Loam	1 to 3	Slight	Irrigated crops, non-irrigated crops, rangeland, pasture	Deep, well-drained with cobbles and gravel, difficult to excavate.
Mikim Loam	3 to 12	High	Irrigated crops, non-irrigated crops, rangeland, pasture	Deep, well-drained soil suited for urban development.
Nehar Stony Sandy Loam	1 to 6	Slight	Rangeland, wildlife habitat	Deep, well-drained soil with high shrink-swell potential, large stones and low soil strength, cobbles and gravel, limited excavation.
Pescar Fine Sandy Loam	0 to 2	Slight	Irrigated pasture and hay, rangeland	Deep, somewhat poorly drained with frequent flooding, high water table and seepage.
Sedillo Gravelly Loam	0 to 3	Slight	Rangeland, wildlife habitat	Deep, well-drained with cobbles and gravel, difficult to excavate.
Syscle Fine Sandy Loam	1 to 3	Slight	Irrigated cultivated crops, pasture, rangeland	Deep, well-drained with cobbles and gravel, difficult to excavate.
Tefton Loam	1 to 3	Moderate	Irrigated cultivated crops, pasture, rangeland	Deep, somewhat poorly drained with flooding, wetness, and fluctuating groundwater table.
Ustic Torriorthents-Ustollic Haplargids Complex	12 to 60	High	Wildlife habitat, rangeland, source of construction material	Deep, somewhat excessively drained with cobbles and gravel, difficult to excavate.
Witt Loam	1 to 8	Moderate	Irrigated crops, non-irrigated crops, rangeland	Deep, well-drained soil with low soil strength and moderate shrink-swell potential.

Geology

Table 3.5-2 summarizes each geologic formation that has been identified and the extent of the formation in the project area. Resources used to identify the present include the *Ground Water Atlas of the United States* (USGS 2004) and the *Geologic Map for the Durango Quadrangle* (USGS 1974).

Table 3.5-2
Summary of Geologic Formations Extent

Geologic Formation	Age	Characteristics	Thickness	Extent
Alluvial Deposits (Qa)	Quaternary	Unconsolidated alluvium, terrace gravels, and alluvial fan deposits. Silt, sand, and gravel are typically in these deposits that can be locally cemented in places.	Vary depending on bedrock topography altered by multiple drainages.	Entire Project Area
Animas Formation (TKa)	Tertiary to Upper Cretaceous	Sedimentary rock type typically dark varicolored sandstone, shale, and conglomerate. Often found containing abundant volcanic and arkosic detritus. Highly weathered at the surface.	2,700 feet	Entire Project Area
Nacimiento and Animas Formations (TKna)	Tertiary to Upper Cretaceous	See Animas and Nacimiento characteristics.	See Animas and Nacimiento thickness descriptions.	Bondad Hill to New Mexico-Colorado State Line
Nacimento Formation (Tn)	Tertiary	Sedimentary rock typically gray and varicolored shale and gray to yellow sandstone. Highly weathered at the surface.	500 feet	Bondad Hill to New Mexico-Colorado State Line
San Jose Formations (Tsbt)	Tertiary	Sedimentary rock type typically light-gray to brown arkosic sandstone and conglomerate interbedded with red, brown, and light-gray claystone and sandstone. Weathering can vary substantially.	2,500 feet	Bondad Hill to New Mexico-Colorado State Line
McDermott Member (Kam)	Upper Cretaceous	Sedimentary rock typically reddish-brown to purple sandstone, breccia, conglomerate, and shale containing abundant volcanic detritus.	Thin outcrops	Farmington Hill

Other important geologic formations in the project area include the Fruitland, Kirtland, and Pictured Cliffs formations. However, these formations are not exposed in the project area and are found at depths greater than the depths that would likely be reached during construction activities.

The surficial geology varies across the project area. The geologic formations present in the vicinity of the intersection of US 160 and US 550 at Farmington Hill includes McDermott Member, Animas Formation, and Alluvial Deposits. From Farmington Hill to Bondad Hill, the geologic formations most likely to be encountered are the Animas Formation and Alluvial Deposits. From Bondad Hill to the New Mexico-Colorado state line, geologic formations most likely to be encountered include Alluvial Deposits, Animas Formation, Nacimiento Formation, Nacimiento and Animas formations, San Jose Formation, and McDermott Member.

Minerals

The project area is located in a physiographic region that has high-yield natural gas and coalbed methane production. The Fruitland Formation is an important gas-producing formation. Near outcrop locations, the Fruitland Formation can seep out methane with high concentrations of hydrogen sulfide. However, outcrops of the Fruitland Formation are not anticipated to be encountered. Gas production wells along the project ROW are further discussed in Section 3.18, *Hazardous Materials*. There are no known surface or subsurface mines in the project area (Colorado Geological Survey [CGS] 2004).

Geologic Hazards

The project area, according to the Federal Emergency Management Agency (FEMA) Multihazard Mapping Initiative (MMI) (2004), is susceptible to infrequent landslides and severe weather. There is less than a 10 percent chance that an earthquake of sufficient magnitude to cause appreciable damage would occur in a 50-year period (peak ground acceleration of 0 to 6 percent). There are no faults of significance in the vicinity of the project area. However, soil faulting and/or bedrock faulting are possible in areas that are seismically dormant or typically not prone to seismic activity.

According to the USGS National Karst Map Project, there are no karst areas of significance in the project area (USGS 2002). Susceptibility for slumping and landslides are low to moderate in the general project area vicinity. However, no known areas of slope instability are located on the compression station sites. In addition, the project areas are susceptible to infrequent flash flooding (FEMA MMI 2004).

The hazards associated with coalbed methane and secondary hydrogen sulfide gas include unexpected releases, explosions, and fires.

3.5.2 Environmental Consequences

Impacts Specific to No Action

The No Action Alternative would have no impacts to the geology or soils within the study area.

Impacts Common to All Alternative Impacts

The potential for soil and geologic impacts would be similar for each of the action alternatives given the construction requirements of a roadway in the study area. The majority of construction and operation activities, and associated impacts, would occur within the first 10 feet of the surface. The soils and surficial geology (rock outcrops) of the study area would be impacted by roadway construction activities that remove vegetation, excavate and compact soils, and blast rock formations to allow for roadway widening. Specific impacts associated with these activities include the following:

- Increased wind and runoff-related soil erosion due to the loss of vegetation cover in construction areas;
- Soil compaction that impairs soil function; and
- Decreased stability of rock outcrops in areas where blasting would be required (i.e. the Bondad Hill area).

Impacts Specific to Alternative 1

Alternative 1 would not have impacts to soils and geology beyond those discussed as impacts common to all alternatives, with the exception of impacts to depths up to an additional 60 feet for retaining wall construction in the vicinity of Bondad Hill.

Impacts Specific to Alternative 2 (Preferred Alternative)

Alternative 2 would not have impacts to soils and geology beyond those discussed for Alternative 1.

Impacts Specific to Alternative 3

Alternative 3 would impact an additional 16 to 20 acres of land, which would increase the potential for wind and runoff-related soil erosion as compared to Alternatives 1 and 2.

3.5.3 Mitigation Measures (Preferred Alternative)

Issue S-1: Construction activities would cause increased wind and runoff-related soil erosion due to the loss of vegetation cover in construction areas.

Mitigation Measure S-1: In addition to the temporary stormwater BMPs that will be installed during construction as part of CDOT's mandatory stormwater permit (Section 2.4.3 *Stormwater Management*), permanent engineering controls to limit soil erosion will be installed as early in the project as possible and remain after project completion. Permanent engineering controls will include using soil berms (check dams), water bars on soil slopes steeper than 3:1, and sediment basins. Additionally, reclamation activities (mulching and reseeding disturbed areas) will take place within 20 days of completion of construction activities.

Effectiveness: Measure S-1 would reduce wind and runoff-related soil erosion both during construction activities and post-construction.

Issue S-2: Construction activities would cause soil compaction that impairs soil function.

Mitigation Measure S-2: Topsoil will be stripped and stored separately during construction activities. Topsoil will be placed on areas to be reclaimed just prior to mulching and reseeding to minimize compaction from construction equipment.

Effectiveness: Measure S-2 would decrease soil compaction and preserve soil function in areas that would be reclaimed.

Issue S-3: Blasting for roadway widening in the Bondad Hill area would decrease the stability of rock outcrops.

Mitigation Measure S-3: Rock fall mesh, rock bolts, and other engineering controls will be incorporated in the final rock cut design to increase slope stability.

Effectiveness: Measure S-3 would increase slope stability in areas where blasting rock outcrops is required.

3.5.4 Residual Adverse Impacts

Some wind- and runoff-related soil erosion would continue to occur during and after construction. Soil function would be impaired long-term in areas compacted and covered by roadway facilities.

3.6 VEGETATION

3.6.1 Affected Environment

Methods

The study area included all areas within 500 feet of the centerline of each alternative evaluated in this EA. Field surveys were performed in May 1999, June 2001, and October 2003.

The distribution of piñon pine-juniper woodland, sagebrush shrubland, riparian areas, and wetlands communities in the project area are shown in Figures 3.2-1 through 3.2-5. Details of each community type are discussed in the following sections.

Vegetation Communities

Piñon Pine-Juniper Woodland. Piñon pine (*Pinus edulis*)-juniper (*Juniperus osteosperma, J. scopulorum*) woodland dominates the west slopes of the Florida Mesa (MPs 13.5 to 15.4), the Bondad Hill area (MPs 4.5 to 7.5), and the western slopes of the Animas River Valley (MPs 0 to 2.5). This vegetation type contains a diverse understory of shrubs, forbs, and grasses; however, much of the ground surface is bare. Shrub species found in these areas include big sagebrush (*Artemisia tridentata*) and mountain mahogany (*Cercocarpus montanus*). Some areas are codominated by a mixture of Gambel oak (*Quercus gambellii*), piñon pines, and junipers. Forbs and succulent species present include knotweed (*Polygonum* spp.), fleabane daisy (*Erigeron divergens*), banana yucca (*Yucca baccata*), plains prickly pear (*Opuntia polyacantha*), desert prickly pear (*Opuntia phaeacantha*), plateau cholla (*Opuntia whipplei*), and claret cup cactus (*Echinocereus triglochidiatus*). Common grasses in this community are blue grama (*Bouteloua gracilis*), Indian ricegrass (*Oryzopsis hymenoides*), and western wheatgrass (*Agropyron smithii*).

Sagebrush Shrubland. Sagebrush shrub is found mostly at the southern end of the Florida Mesa (MPs 6 to 7.5) and the northern portion of the Animas River Valley (MPs 3.7 to 4.2). The community is dominated by big sagebrush. Secondary dominant shrub species include rubber rabbitbrush (*Chrysothamnus nauseousus*) and antelope bitterbrush (*Purshia tridentata*). Previously undisturbed or relatively undisturbed areas of sagebrush shrub that have experienced disturbance (e.g., disking, clearing) are often characterized by higher numbers of rabbitbrush due to this species' ability to recover from disturbance at a faster rate.

The open portions of sagebrush shrub are inhabited by a variety of grass species. Undisturbed sagebrush shrub often contains native grass species including blue grama (*Bouteloua gracilis*), Indian ricegrass, western wheatgrass, slender wheatgrass (*Elymus*

trachycaulus), sand dropseed (*Sporobolus cryptandrus*), and prairie junegrass (*Koeleria macratha*). Forbs commonly observed in this community include penstemon (*Penstemon* spp.), hairy goldenaster (*Heterotheca villosa*), and alyssum (*Alyssum* spp.). Disturbed sagebrush areas are characterized by the presence of non-native annual grasses including cheatgrass (*Bromus tectorum*) and smooth brome (*Bromus inermis*), as well as some native species, with non-natives dominating areas of more recent or considerable disturbance.

Riparian Areas

Riparian plant communities are those developed in response to favorable soil moisture, organic carbon, and nutrients plus microclimatic regimes caused by streams and rivers. The riparian ecosystem is considered valuable for providing wildlife and fisheries habitat, maintaining water quality, stabilizing stream banks, providing flood control, and enhancing scenic and aesthetic values.

The two principal riparian plant communities in the US 550 project area are riparian woodland and riparian shrubland. Riparian areas within the project area exist primarily at the Animas River crossing with some small additional areas at the Deer Creek crossing.

Riparian woodland is dominated by narrowleaf cottonwood (*Populus angustifolia*), broadleaf cottonwood *(Populus deltoides),* box elder *(Acer negundo),* chokecherry *(Prunus virginiana),* Russian olive (*Elaeagnus angustifolia),* and alder (*Alnus incana*). Understory vegetation includes shrubs such as wild rose (*Rosa woodsii*), skunkbush sumac (*Rhus trilobata*), hawthorn (*Crataegus rivularis*), and sandbar willow (*Salix exigua*); and forbs and grasses such as dogbane (*Apocynum cannibinum*), dandelion (*Taraxacum officinale*), English plantain (*Plantago lanceolata*), Kentucky bluegrass (*Poa pratensis),* smooth brome (*Bromus inermis*), foxtail barley (*Hordeum jubatum*), and redtop (*Agrostis stolonifera*).

Riparian shrubland is dominated by sandbar willow and often extends outside of adjacent wetland boundaries, especially in areas where there is a gradual change in elevation from wetland to upland. Riparian shrubland also may persist in areas where there has been a loss in wetland hydrology. Shrub wetlands are discussed in more detail in Section 3.2.

Wetlands

Wetlands are those areas that are inundated or saturated with water at or near the surface of the soil for a sufficient duration during the growing season to develop characteristic soils and vegetation. Many wetlands are protected under the CWA (Section 404) as waters of the United States and "special aquatic sites," and are under the jurisdiction of the Corps. Wetlands occur throughout the project area, with their distribution closely linked to irrigation practices and the presence of rivers and perennial streams. Wetlands are discussed in detail in Section 3.3, *Wetlands.*

Other Habitats

Other habitats in the project area include areas that are disturbed, active or inactive agriculture, and developed. Disturbed habitat is land on which the native vegetation has been considerably altered by agriculture, construction, or other land-clearing activities.

Such habitat is typically found in vacant or cleared lots, roadsides, construction staging areas, and abandoned fields, and is usually dominated by non-native annual species and perennial broad-leafed species. Agricultural areas are found throughout the project area, but mostly on Florida Mesa (MPs 6.0 to 15.4). The agricultural areas primarily consist of irrigated grasses and/or alfalfa hay and pasture. Developed areas support little or no native vegetation and may be additionally characterized by the presence of manmade structures such as buildings or roads. Developed areas are found in various densities throughout the project area, with highest densities at Sunnyside.

3.6.2 Environmental Consequences

Impacts Specific to No Action

There would be no impacts to native vegetation resulting from the No Action Alternative.

Impacts Common to All Action Alternatives

The primary direct impact to vegetation would be removal of existing vegetation within the limits of construction. All of the alternatives would affect native vegetation communities including piñon-juniper woodlands, sagebrush shrubland, riparian areas, and wetlands. Impacts to wetlands are discussed in detail in Section 3.3, *Wetlands*. Impacts to native vegetation communities were assessed by overlaying the highway construction footprint and the mapped community areas.

Direct impacts to native vegetation common to all action alternatives are summarized in Table 3.6-1 as well as temporary and permanent impacts. Areas of temporary disturbance would be seeded with native grasses for soil stabilization and not necessarily restored to the original native vegetation (including trees and shrubs). Therefore, all areas of disturbance to native vegetation communities within the construction footprint are considered to be long-term impacts.

Impacts would be the same for each alternative except in the Bondad Hill area (MP 3.1 to 6.6). Total impacts by alternative are described in subsequent sections.

Table 3.6-1
Impacts to Native Vegetation Communities
Common to All Action Alternatives by Road Segment in Acres

Community Type	Piñon-Juniper	Sagebrush Shrubland	Riparian	Total*	Temporary Impact	Permanent Impact
MP 0.0 – 3.1	0.73	0.00	0.04	0.77	0.739	0.001
MP 6.6 – 10.5	0.80	0.19	0.00	0.99	0.99	0.0
MP 10.5 – 15.4	0.69	0.00	0.06	0.74	0.47	0.27
Total	**2.2**	**0.19**	**0.09**	**2.50**	**2.02**	**0.45**

* Impacts do not include already disturbed areas.

Impacts to native vegetation may also occur from noxious weeds and from erosion and sedimentation. Noxious weeds are likely to invade areas disturbed during construction, and may spread into adjacent native habitats and agricultural lands. Impacts and proposed mitigation associated with noxious weeds are described separately in Section

3.7, *Noxious Weeds*. Clearing and grading would remove vegetation and soil crusts that stabilize the soil surface, leading to increased erosion within and adjacent to the construction area, and deposition of sediment on downstream vegetation. Soil erosion and sedimentation reduces vegetation cover and productivity, and can have long-term effects on vegetation structure and composition in affected areas. Erosion and sedimentation would be controlled by the erosion control practices required by CDOT's National Pollutant Discharge Elimination System (NPDES) permit and stormwater management plan described in Chapter 2.

Impacts Specific to Alternative 1

Table 3.6-2 summarizes total impacts associated with Alternative 1.

Table 3.6-2
Total Impacts to Native Vegetation
Communities Under All Action Alternatives

Community Type	Piñon-Juniper	Sagebrush Shrubland	Riparian	Total[1]
Alternative 1				
MP 3.1 – 6.6	27.1	20.71	2.01	49.82
Total Impacts Common to All Alternatives	2.2	0.19	0.09	2.48
Total	**29.32**	**20.9**	**2.10**	**52.3**
Alternative 2 (Preferred Alternative)				
MP 3.1 – 6.6	29.3	23.31	2.05	54.66
Total Impacts Common to All Alternatives	2.2	0.19	0.09	2.48
Total	**31.5**	**23.5**	**2.14**	**57.14**
Alternative 3				
MP 3.1 – 6.6	49.8	20.61	2.08	72.49
Total Impacts Common to All Alternatives	2.22	0.19	0.09	2.48
Total	**52.0**	**20.8**	**2.17**	**74.97**

[1]Numbers may not add to total due to rounding error.

Piñon Pine-Juniper Woodland

Approximately 29.3 acres of piñon-juniper woodland would be removed during roadway construction, with the greatest impact (27.1 acres) being between MPs 3.1 and 6.6 in the area surrounding Bondad Hill. The impact in this area would be the result of straightening the curve around Bondad Hill.

Sagebrush Shrubland

A total of 20.9 acres of sagebrush shrubland within the project area would be impacted. Most of this impact would occur on the south side of Bondad Hill (20.71 acres).

Riparian Areas

A total of 2.1 acres of riparian area would be impacted at the Animas River and Deer Creek crossings. Riparian areas bordering the Animas River would be impacted by reconstruction and expansion of the bridge. Deer Creek riparian areas would be reduced by installing an expanded box culvert at the road crossing.

Impacts Specific to Alternative 2

Table 3.6-2 summarizes total impacts associated with Alternative 2.

Piñon Pine-Juniper Woodland

Impacts to the piñon-juniper woodland community would be similar to those described in Alternative 1. There would be an increase of approximately 2 acres of impact resulting from an alignment shift further east over Bondad Hill.

Sagebrush Shrubland

The impacts to the sagebrush shrubland community would be similar to those described in Alternative 1. There would be approximately 3 additional acres of impact resulting from an alignment shift from east to west on the southern end of Bondad Hill.

Riparian Areas

Impacts to riparian areas would be nearly the same as those described in Alternative 1. An addition of 0.04 acre of impact would result from minor design variations at the Animas River crossing.

Reclaimed Roadway

Approximately 6,800 linear feet of roadway would be realigned at Bondad Hill. All of it would be within 200 feet of the existing roadway, and much of it would be immediately adjacent.

Impacts Specific to Alternative 3

Table 3.6-2 summarizes total impacts associated with Alternative 3.

Piñon Pine-Juniper Woodland

Alternative 3 would result in the loss of approximately 52 acres of piñon-juniper woodland. The greatest loss of contiguous piñon-juniper woodland (49.8 acres) would result from the alignment shifting to the east side of Bondad Hill. Other losses of this community would be similar to Alternatives 1 and 2.

Sagebrush Shrubland

The impacts to the sagebrush shrubland community would be similar to those described in Alternative 1.

Riparian Areas

Impacts to riparian areas would be nearly the same as those described in Alternative 1. An additional 0.07 acre of impact would be the result of minor design variations at the Animas River crossing.

Reclaimed Roadway

About 8,000 feet of US 550 would be relocated east of Bondad Hill, and about 2,800 feet of the existing roadway would be maintained as a local road after relocating US 550. The abandoned road and shoulders occupy about 6.3 acres and are mostly bordered on both sides by native piñon-juniper woodland.

3.6.3 Mitigation Measures (Preferred Alternative)

Issue V-1: Loss of riparian vegetation and potential long-term loss of habitat values, due to roadway construction.

Mitigation Measure V-1A: The construction ROW will be fenced where it passes through riparian vegetation to prevent temporary disturbance outside the construction limits. Construction staging areas will not be placed in riparian areas.

Mitigation Measure V-1B: All disturbed areas within riparian areas not occupied by permanent facilities will be revegetated with appropriate native species. Riparian areas disturbed during construction will be stabilized as soon as possible.

Mitigation Measure V-1C: In riparian areas, trees removed during construction will be replaced at a 1:1 ratio based on a stem count of all trees with a diameter at breast height of 2 inches or greater. Riparian shrubs will be replaced based on their preconstruction aerial coverage. All replacement trees and shrubs will be native species.

Effectiveness: These actions would reduce the area of direct disturbance to riparian areas, and would restore 0.65 acres of riparian vegetation temporarily impacted by construction activities. Complete restoration of riparian areas temporarily impacted by construction activities may take 10-50 years.

Issue V-2: Potential long-term loss of other native vegetation communities.

Mitigation Measure V-2: Abandoned and reclaimed road and ROW will be revegetated with native vegetation. Revegetation will include planting or seeding of piñons and junipers where bordered by piñon-juniper woodland, and sagebrush where bordered by sagebrush shrubland.

Effectiveness: This measure would restore native vegetation on 31 acres where the existing roadway would be abandoned. Complete restoration of piñon-juniper woodland may take up to 50 years.

3.6.4 Residual Adverse Impacts

Up to 2.14 acres of existing riparian vegetation would be removed during construction. Replacement of riparian trees at a 1:1 ration and riparian shrubs based on pre-construction aerial coverage would replace 0.65 acre of riparian vegetation temporarily impacted by construction activities, but there would be a long-term loss of riparian habitat values in revegetated areas during the time that it takes shrubs and trees to reach mature size (approximately 3-10 years for shrubs, 10-50 years for trees). Additionally, approximately 1.47 acres of riparian vegetation would be permanently lost to roadway facilities.

About 31.5 acres of piñon-juniper woodland and 23.5 acres of sagebrush would be permanently lost. Revegetation of the old roadbed would replace 10.5 acres of sagebrush shrubland and 20.5 acres of piñon-juniper woodland. There would be a long-term loss of sagebrush shrubland and piñon-juniper woodland habitat values in revegetated areas during the time that it takes shrubs and trees to reach mature size.

3.7 NOXIOUS WEEDS

3.7.1 Affected Environment

Noxious weeds are plant species that have been officially designated as such by the State of Colorado and/or individual counties. Noxious weeds are not native to Colorado and have negative impacts on crops, native plant communities, livestock, and/or the management of natural or agricultural systems. Management of noxious weeds is required under Federal Executive Order 13112 *Invasive Species, State of Colorado* Executive Order D 0-6 99-*Development and Implementation of Noxious Weed Management Programs, and the Colorado Noxious Weed Management Act* (Colorado Revised Statutes [CRS] 35-5.5).

The La Plata County Weed Office maintains a list of noxious weeds that are a priority for the county. The list of weeds eligible for the cost share program is more inclusive than the list of high priority weeds identified by the county. Table 3.7-1 presents a list of the noxious weeds managed by La Plata County and that were observed along US 550, and/or likely to be present based on Colorado Department of Agriculture quarter quadrant weed maps (Colorado Department of Agriculture, 2002). Other state-listed noxious weed species are also included. The noxious weed species listed in Table 3.7-1 were observed during field studies in the project area.

Table 3.7-1
Noxious Weeds Observed in the US 550 Project Corridor

Plant Name	Species	La Plata County Weed List	La Plata County Cost Share List	Colorado Noxious Weed List
Canada thistle	*Cirsium arvense*	X	X	X
Chicory	*Chicorium intybus*			X
Common burdock	*Arctium minus*			X
Curly dock	*Rumex crispus*	X	X	
Downy brome, cheatgrass	*Bromus tectorum*			X
Field bindweed	*Convolvulus arvensis*	X		X

Plant Name	Species	La Plata County Weed List	La Plata County Cost Share List	Colorado Noxious Weed List
Hoary cress, whitetop	*Cardaria draba*	X	X	X
Houndstongue	*Cynoglossum officinale*	X	X	X
Musk thistle	*Carduus nutans*	X		X
Quackgrass	*Elytrigia repens*			X
Redstem filaree	*Erodium cicutarium*			X
Russian knapweed	*Centaurea repens*	X	X	X
Russian olive	*Elaeagnus angustifolia*			X
Spotted knapweed	*Centaurea maculose*	X	X	X
Salt cedar, tamarisk	*Tamarix parviflora, T. ramosissima*			X

3.7.2 Environnemental Consequences

Impacts Specific to No Action

The No Action Alternative would neither increase nor decrease the distribution and abundance of noxious weeds in the study area.

Impacts Common to All Action Alternatives

Various construction activities have the potential to increase the abundance of existing noxious weeds or to introduce new noxious weeds into the project area. These activities include mobilizing construction vehicles, excavating and moving borrow materials and topsoil, land clearing, and reclamation. Removing existing vegetation and disturbing soils would encourage germination of seed and allow spread of weeds from airborne seeds.

After construction, noxious weeds can persist or become established on road edges and in reclaimed areas, and vehicle traffic can spread or introduce weeds along the road ROW. Noxious weeds that establish in construction areas and along the road ROW may spread into adjacent lands, resulting in degradation of habitat quality in riparian areas and other natural habitats, along with decreased value and increased management costs in agricultural and developed areas.

Impacts Specific to Alternative 1

Alternative 1 would not have impacts to noxious weeds beyond those discussed as impacts common to all alternatives. Impacts would occur along the existing highway alignment. Approximately 52.3 acres of native vegetation would be impacted and become vulnerable to noxious weed introduction under Alternative 1.

Impacts Specific to Alternative 2 (Preferred Alternative)

Alternative 2 would not have impacts to noxious weeds beyond those discussed as impacts common to all alternatives. Impacts would occur along the existing highway alignment. Approximately 57.14 acres of native vegetation would be impacted and become vulnerable to noxious weed introduction under Alternative 2.

Impacts Specific to Alternative 3

Impacts from Alternative 3 would occur both along the existing highway alignment and along the new alignment at Bondad Hill. Dry land weeds such as musk thistle and spotted knapweed may invade along the new cleared corridor and spread to adjacent habitats. Approximately 74.97 acres of native vegetation would be impacted and become vulnerable to noxious weed introduction under Alternative 3. This alternative would disturb about 16 to 20 acres more land than the other alternatives.

3.7.3 Mitigation Measures (Preferred Alternative)

Issue NW-1: Mobilizing construction vehicles, excavating and moving borrow materials and topsoil, land clearing, and reclamation may bring noxious weeds or introduce new noxious weeds into the project area.

Mitigation Measure NW-1A: Monthly noxious weed surveys will take place during the growing season to identify and treat noxious weeds.

Mitigation Measure NW-1B: Contractors' vehicles will be washed before being brought onto the project site to ensure that they are free of soil and debris capable of transporting noxious weed seeds or roots from other areas.

Mitigation Measure NW-1C: Disturbed areas will be reclaimed. Certified weed-free mulch will be used for reclamation, and weed-free straw bales will be used for sediment barriers during construction. Topsoil sources used in reclamation will be examined for noxious weeds prior to being brought on site.

Effectiveness: The proposed mitigation would limit the spread of existing noxious weeds and reduce the likelihood of introducing new noxious weeds into the project area.

Issue NW-2: New weed infestations may occur after the project is completed. Noxious weeds that establish in construction areas and along the road ROW may spread into adjacent lands, resulting in degradation of habitat quality in riparian areas and other natural habitats.

Mitigation Measure NW-2: Post-construction monitoring will be used to identify new weed infestations and to evaluate the effectiveness of weed control methods. Monitoring and weed controls will be implemented for 3 years after construction.

Effectiveness: The proposed post-construction monitoring and weed control would prevent new weed infestations from getting established after construction activities are completed.

3.7.4 Residual Adverse Impacts

Noxious weeds would continue to occur in the project area, but at levels of abundance that should not adversely affect neighboring lands and resource values. Some noxious weeds may be very difficult to control. New noxious weed species may appear after the 3 year post-construction monitoring period because of transport by vehicles along the highway or wind.

3.8 WATER RESOURCES

This section describes surface water resources that occur in the study area, including floodplains and water quality. Wetlands and riparian areas are discussed separately in Section 3.3, *Wetlands*.

The entire study area is located within the San Juan River Basin and within the watershed of one of its principal tributaries, the Animas River. The Animas River extends from the headwaters near Silverton, Colorado, south beyond the New Mexico border to Farmington, where it confluences with the San Juan River. The existing US 550 alignment crosses the Animas River once within the study area, near Bondad, Colorado.

3.8.1 Affected Environment

Floodplains

The Animas River, in the general area of the existing US 550 river crossing, is a well-defined channel that flows from the north to the south and parallels US 550. The channel banks range from steep rock banks to shallow areas with sediment deposits. The channel meanders upstream of the crossing locations and then straightens out downstream.

Floodplains are defined as the land on either side of a river that is inundated with floodwaters that exceed the capacity of the river channel during a specific storm event. Changes in the floodplain such as adding fill material, constructing buildings, or in any way limiting the natural conveyance of floodwaters can cause a rise in the 100-year storm water surface and can subsequently impact properties not originally impacted by a 100-year storm event.

Executive Order 11988, *Floodplain Management* (1977), was authorized to direct federal agencies to "provide leadership and take action to reduce the risk of flood loss, to minimize the impacts of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains." This Executive Order was authorized to assist in the furtherance of the NEPA of 1969 (amended), National Flood Insurance Act of 1968 (amended), and the Flood Disaster Protection Act of 1973.

CFR, Title 23 - Highways, Chapter I – FHWA, DOT, Part 650 – Bridges, Structures, and Hydraulics, prescribes the policies and procedures that FHWA are directed to implement in the "location and hydraulic design of highway encroachments on floodplains." Part 650 requires that a new or revised water crossing would be sized to not produce a rise in the upstream water surface by more than 1.0 foot. This provides guidance for the sizing of a new structure at the Animas River.

CFR, Title 44 – Emergency Management and Assistance, Chapter I – FEMA contains the basic policies and procedures of FEMA to regulate floodplain management and to analyze, identify, and map floodplains for flood insurance purposes. The portion of the Animas River located in the study area is not identified in the La Plata County, Colorado FEMA Flood Insurance Study and therefore is not required to meet the requirements of CFR, Title 44. However, the Animas River crossing will need to meet the CFR, Title 23 requirements.

Water Quality

Under the Colorado Department of Health and Environment (CDPHE), Water Quality Control Commission (WQCC), the classification and numeric water quality standards for the San Juan River Basin, including the Animas River have been established. The portion of the Animas River that parallels the study area is Segment 5b of the Animas and Florida River Basin "Mainstem of the Animas River, including wetlands, from the Southern Ute Indian Reservation boundary to the Colorado/New Mexico border"). The water quality classifications for Segment 5b (CDPHE 2004) are as follows:

- Cold Water Aquatic Life Class 1
- Recreation 1a
- Water Supply
- Agriculture

These classifications are defined by the Colorado WQCC as follows (CDPHE 2004):

- **Cold Water Aquatic Life Class 1** – Waters capable of sustaining a wide variety of cold water biota, including sensitive species.
- **Recreation Class 1a** – Waters in which primary contact uses have been documented or are assumed to be present.
- **Water Supply** – Waters suitable for potable water supplies after standard treatment.
- **Agriculture** – Waters suitable for irrigation of crops and watering livestock.

Section 303(d) of the CWA requires states to develop a list of impaired (i.e., not meeting water quality standards) every two years. WQCC Regulation No. 93 includes the 2004 303(d) list of impaired stream segments, which does not include the stream segment in the study area (CDPHE 2004). The San Juan Basin generally has high water quality except for some segments affected by mine waste and some segments with high concentrations of total suspended solids (TSS) and total dissolved solids (TDS). The segments of the Animas River affected by these high TSS and TDS concentrations areas are near the headwaters.

Standard CDOT winter maintenance practices along US 550 within the study area includes road plowing the entire study area segment, applying sand from the New Mexico-Colorado border to MP 9 (near Sunnyside School), and applying magnesium chloride from MP 9 to the US 160 to US 550 junction (CDOT 2003). The sand hasmade its way to surface waters, contributing to stream sediment load. The area that may be affected the most under existing conditions is near MP 4, where the highway crosses the Animas River.

3.8.2 Environmental Consequences

Impact Assessment Methodology

The entire US 550 corridor was evaluated as a whole for water resources. Project alternative impacts were assessed both qualitatively and quantitatively for water resources. The qualitative analysis was performed by reviewing existing water quality

data. The quantitative analysis included the Driscoll Model to assess existing versus future water quality conditions in the Animas River as a function of each of the proposed alternatives, and performing a hydrologic and hydraulic analysis of the Animas River crossing to determine existing and future floodplain elevations.

Floodplains and Hydrology

Location Hydraulic Study

A Location Hydraulic Study (Study) was conducted as outlined in 23 CFR 650, Subpart A is to identify areas within natural stream channels that are being encroached upon by the proposed improvements for each of the action alternatives. A floodplain encroachment analysis was performed for the Animas River for the location where US 550 crosses the floodplain. No additional studies discussing the Animas River's floodplain, hydraulics, or hydrology were identified for the study area. No drainage issues have been identified within the study area, and no roadside flooding or roadway overtopping has been documented within the study area.

There are no FEMA maps defining floodplain boundaries for the Animas River. The study area is associated with Flood Insurance Rate Map (FIRM) Panel 0800970675B, which is identified as the Southern Ute Indian Reservation and has not been included as part of FEMA's La Plata County regulatory floodplain delineations.

Hydraulic Analysis

The 100-year flood event flow rates used for the hydraulic analysis of the Animas River were obtained by analyzing two USGS stream gages. There is a downstream stream gage (USGS 09363500) in the Animas River Near Cedar Hill, New Mexico. The second stream gage used is the USGS 09363200 Florida River at Bondad, Colorado located just upstream from the confluence with the Animas River. A Log-Pearson analysis was performed for each gage to determine flow rates for given return periods. An approximation approach to estimate the flow rates at the roadway crossing was performed by taking the difference in the flow rates between the two gages to determine the flow rate passing through the crossing location. The 100-year flood event flow rate for the US 550 crossing of the Animas River has been estimated as 12,542 cubic feet per second (cfs).

A one-dimensional gradually varied steady-state hydraulic model was prepared for the existing and proposed US 550 crossings of the Animas River using the Corps HEC-RAS model. A No Action, or existing conditions, hydraulic model of the Animas River was prepared to determine approximate water surface elevation along the river both upstream and downstream from the existing US 550 river crossing. A description of the model and model output is included in Appendix H. The existing bridge is a 5 span, 352 foot long by 30-foot wide, two-lane bridge on a 30 degree skew. The bridge piers are 20 feet wide at the bottom and 5 feet wide at the tops.

Water Quality

In general there are two main sources of pollution, non-point and point sources. Non-point source pollution typically originates from activities such as construction and stormwater runoff. Point sources of pollution typically originate from a single,

recognizable source such as a pipe or outfall where an industry or wastewater treatment plant discharges treated effluent, but can also include construction dewatering and runoff.

There are a number of water quality issues associated with highway stormwater runoff both during and after construction, such as:

- Sediment Loading (Total Suspended Solids) – from road sanding and maintenance activities and construction
- Heavy metals (zinc and copper) from automobiles on the roadway
- Magnesium chloride – road de-icer
- Oil and grease from automobiles on the roadway

As outlined in Chapter 2, *Alternatives*, pollutants would be controlled through both temporary (during construction) and permanent BMPs minimizing the impacts to the existing water quality condition. As outlined below, in some cases BMPs may actually provide improvements to the existing conditions.

Driscoll Method

The Driscoll Model was used to estimate the water quality impacts associated with the Existing Condition/No Action Alternative and the action alternatives, for total copper and total zinc. It is assumed that these two pollutants provide an overall picture of the water quality impacts associated with the highway improvements. Most other water quality impacts that can occur with highway improvements (magnesium chloride and oil and grease, etc.) are minor when compared to TSS and heavy metals. Due to the limitations of the model and the lack of site-specific data, the Driscoll Model was used only as a screening tool to identify potential water quality problems.

The Driscoll Method is a procedure for estimating the impacts of highway runoff on the water quality of receiving waters such as streams, rivers, and lakes. This methodology was applied to the US 550 study area to assess the water quality impacts from the various alternatives. Details of this procedure are provided in the four volumes of *Pollutant Loadings and Impacts from Highway Stormwater Runoff* (Driscoll et al. 1989, 1990a, 1990b, 1990c).

The concentration from the Driscoll model only reflects the contribution to the stream from a highway runoff event. The model assumes the background water to be distilled water. This method can indicate if the highway pollutants have the potential to exceed the regulatory standards. The in-stream concentrations calculated from the Driscoll model were over an order of magnitude less than the regulatory values and indicate that all alternatives will not likely cause a toxicity problem.

Table 3.8-1 summarizes CDPHE and USEPA standards and effect levels used in the analysis for the metals in dissolved form. The CDPHE acute standards (CDPHE 2002) are based on short-term, continuous-exposure contact with safety factors. However, minor or infrequent exceedances of these values may not result in adverse impacts. Therefore, the less conservative thresholds from the NURP (USEPA 1983), which do not have safety factors applied and for which short-duration intermittent exposures are likely to have adverse impacts, are also used in the analysis.

Table 3.8-1
Water Quality Standards and Effect Levels

Constituents (dissolved)	CDPHE Acute Standards (µg/L)	USEPA Threshold Effect Level (µg/L)
Copper	26	80
Zinc	211	1,200

µg/L = micrograms per liter

The methodology in *Pollutant Loadings and Impacts from Highway Stormwater Runoff, Design Procedures, Volume I* (Driscoll et al. 1990a) was used to estimate pollutant loading before and after the proposed US 550 improvements. Using the Driscoll model as a screening tool, the additional loadings from this highway project will not exceed the acute criteria. This segment of the Animas River has not been identified as an impaired stream and the additional loadings will not likely cause a toxicity problem.

Table 3.8-2 and 3.8-3 summarize the Driscoll Model results and the anticipated reduction in loading that can be achieved through the implementation of various BMPs.

Table 3.8-2
Summary of Annual Mass Loading of Heavy Metals

Alternative	Total Copper (pounds)	Total Zinc (pounds)	Percent increase in loading from Existing/No Action
Existing/No Action	0.011	0.041	--
Alternative 1	0.035	0.127	211%
Alternative 2	0.037	0.135	230%
Alternative 3	0.035	0.130	218%

Overall, the estimated annual increase in mass loading for any of the action alternatives is substantial without the installation of permanent BMPs, however, with the implementation of permanent BMPs as described in Section 2.3.2.1 (removal of 80% of the average annual TSS), the action alternatives would have no impact when compared to the existing condition. Since copper and zinc have relatively low solubility in stormwater, it is assumed that removal of TSS would also remove copper and zinc. Table 3.8-3 provides a summary of BMP removal ranges for Total Zinc [the source of this information did not provide values for copper removal rates, however it is assumed that since copper is easier to drop out of solution than zinc, the removal ranges are conservative in predicting copper removals (Huyck, 2004)].

Table 3.8-3
BMP Removal Ranges (%) for Total Zinc in
Stormwater Runoff and Most Probable Range for BMPs (CDOT, 2004, Table 4.7)

BMP	Zinc	
-----	Literature Reported Range	Expected Probable Range (UDFCD Volume 3 BMPs)
Grass Buffer	0-10	0-10
Grass Swale	0-40	0-20
Modular Block Porous Pavement	98	40-80
Porous Pavement Detention	10-98	40-80
Porous Landscape Detention	10-98	50-80
Extended Detention Basin	30-60	30-60
Constructed Wetland Basin	-29-82	30-60
Retention Pond	0-71	20-60
Sand Filter Extended Detention	10-98	50-80
Constructed Wetland Channel	0-40	20-40

Tables 3.8-4 and 3.8-5 depict the amount of annual mass loading of total copper and total zinc that can be removed at a range of removal efficiencies.

Table 3.8-4
Summary of BMP Removal Efficiencies for Total Copper

Percent Removal	Existing/No Action 0.011 pounds/year	Alternative 1 0.035 pounds/year	Alternative 2 0.037 pounds/year	Alternative 3 0.035 pounds/year
10	0.010	0.031	0.033	0.031
20	0.009	0.028	0.029	0.028
30	0.008	0.024	0.026	0.024
40	0.007	0.021	0.022	0.021
50	0.006	0.017	0.018	0.017
60	0.004	0.014	0.015	0.014
70	0.003	0.010*	0.011*	0.010*
80	0.002	0.007	0.007	0.007
90	0.001	0.003	0.004	0.003

*Indicates the removal efficiency needed for a particular BMP to achieve the existing water quality condition.

Table 3.8-5
Summary of BMP Removal Efficiencies for Total Zinc

Percent Removal	Existing/No Action 0.041 pounds/year	Alternative 1 0.127 pounds/year	Alternative 2 0.135 pounds/year	Alternative 3 0.130 pounds/year
10	0.037	0.114	0.121	0.117
20	0.033	0.102	0.108	0.104
30	0.029	0.089	0.094	0.091
40	0.024	0.076	0.081	0.078
50	0.020	0.063	0.067	0.065
60	0.016	0.051	0.054	0.052
70	0.012	0.038*	0.040*	0.039*
80	0.008	0.025	0.027	0.026
90	0.004	0.013	0.013	0.013

*Indicates the removal efficiency needed for a particular BMP to achieve the existing water quality condition.

As indicated in the above tables, the existing water quality conditions can be met by implementing a BMP strategy that has about 70% removal efficiency.

Impacts Specific to No Action

Floodplains and Hydrology

The No Action Alternative would have no additional impacts on the Animas River Floodplain.

A No Action Alternative hydraulic model of the Animas River was prepared to determine approximate water surface elevation along the river both upstream and downstream from the existing US 550 river crossing. The existing bridge is a five-span, 352-foot-long by 30-foot-wide, two-lane bridge on a 30-degree skew. The bridge piers are 20 feet wide at the bottom and 5 feet wide at the tops.

The hydraulic analysis for the No Action Alternative shows the existing bridge would pass the 100-year storm under the bridge, but it appears to be very inefficient. The backwater effects caused by the bridge, the difference between the upstream and downstream water surface elevation at the bridge, is more than 16 feet.

Water Quality

The No Action Alternative would have no construction-related impacts to surface water quality, but it would have impacts from continued traffic use and highway maintenance. The No Action Alternative would result in less surface runoff than an action alternative because there would be less paved surface area.

Continued increases in traffic would result in proportional long-term increases in runoff contaminants. The amounts of traction sand used would probably remain the same as currently used and would be less than the proposed alternatives. There is a potential for spills of chemicals or hazardous materials in accidents, which would increase with increasing traffic rates. The potential for spills and released under the No Action Alternative would be higher than with the action alternatives because of poorer safety conditions.

Impacts Common to all Action Alternatives

Floodplains and Hydrology

Impacts to the floodplain at the Animas River crossing were determined based on the change in upstream water surface elevation taken at the upstream bridge face. The upstream water surface elevation was allowed to rise up to 1 foot above the No Action water surface according to CFR, Title 23, Part 650. All alternatives cross the Animas River at the same location. This produces the same impact for all alternatives.

The No Action hydraulic model was used to create an action alternatives hydraulic model. The alternatives model includes a proposed bridge sized for the four-lane facility. The proposed bridge size is two bridges, each being a three-span, 372-foot by 45-foot bridge on a 30-degree skew parallel to each other. The bridge piers were analyzed as 5 feet wide from top to bottom.

The proposed US 550 Animas River crossing would be hydraulically improved by constructing a bridge that creates less upstream ponding during the 100-year flood event. The hydraulic analysis results for the bridge under all action alternatives shows that the bridge would only create approximately 6 inches of backwater. This bridge would reduce the upstream 100-year water surface elevation by more than 15 feet over the No Action Alternative. This is an improvement and would not impact the Animas River. By reducing the water surface, bridge scour and upstream channel stability would be improved. The hydrology and floodplain of the Animas River would not be impacted by any of the build alternatives, and no floodplain mitigation is anticipated for the Animas River.

Water Quality

Without permanent BMPs, the increase in the hydrologic demand due to roadway widening and associated activities would result in the degradation of water quality by transporting pollutants to the Animas River. While toxicity effects are unlikely, without the use of appropriate BMPs water quality impacts would occur during construction. Construction activities, including excavating and grading, would alter local surface drainage patterns, and contribute sediment and associated metals, such as copper and zinc to the Animas River.

The results of the Driscoll Method for the action alternatives are summarized in Tables 3.8-1 through 3.8-5, and are provided in their entirety in Appendix H. Results show that for the existing and future conditions, pollutant loadings would increase substantially without the use of permanent BMPs; however, with the implementation of permanent BMPs designed to remove 70% of the pollutant loading (as measured by total zinc and copper loading), there would be no water quality impacts beyond existing conditions. As part of the project design for any of the action alternatives CDOT would install BMPs designed to remove at least 80% of the average annual TSS loading from the average storm event (see Section 2.3.2.1, *Design Features Common to All Action Alternatives*).

Impacts Specific to Alternative 1

Alternative 1 would not have floodplain, hydrology or water quality impacts beyond those discussed that are common to all action alternatives.

Impacts Specific to Alternative 2

Alternative 2 would not have floodplain or hydrology impacts beyond those discussed that are common to all action alternatives.

Impacts Specific to Alternative 3

Alternative 3 would not have floodplain or hydrology impacts beyond those discussed that are common to all action alternatives.

3.8.3 Mitigation Measures (Preferred Alternative)

Due to the temporary BMPs that will be installed during construction, and the permanent BMPs that will be installed as part of the Preferred Alternative project design to remove 80% of the average annual TSS loading from the average storm (see Section 2.3.2.1 *Design Features Common to All Action Alternatives)*, no additional mitigation is required.

3.8.4 Residual Adverse Impacts

There would be some residual pollutant loading from the roadway, however, water quality would improve over existing conditions as a result of implementation of permanent BMPs.

3.9 AIR QUALITY

3.9.1 Affected Environment

"Air pollution" is a general term that refers to one or more substances that degrade the quality of the atmosphere and environment. Individual air pollutants degrade the environment by reducing visibility, damaging property, reducing the productivity or vigor of crops and natural vegetation, and adversely affecting human and animal health. Regulations for air pollutant emissions exist to protect human health and welfare and the environment.

USEPA is charged with developing and enforcing regulations that govern air quality in accordance with the 1970 Federal Clean Air Act (CAA). In Colorado, USEPA delegates authority to the Colorado Air Quality Control Commission (CAQCC), which has adopted regulations in accordance with Sections 24-4-103(1) and 25-7-105(1)(a)(II) of the CRS. The lead air quality planning agency for La Plata County is CDPHE.

Ambient Air Standards

The CAA established National Ambient Air Quality Standards (NAAQS) designed to protect public health. Seven criteria air pollutants have been identified by USEPA as being of concern nationwide: carbon monoxide (CO), sulfur dioxides (SO_2), nitrogen dioxides (NO_2), ozone (O_3), particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$), particulate matter less than ten micrometers in diameter (PM_{10}), and lead (Pb). The State of Colorado has adopted the federal NAAQS standards for regulatory purposes.

The pollutants that are most relevant for this air quality impact analysis are those that can be traced principally to motor vehicles and construction activities. In the study area, ambient concentrations of CO and O_3 are predominantly influenced by motor vehicle activity. Ozone is not emitted directly from vehicles but is formed from the photochemical reaction of other pollutants, namely NO_2 and volatile organic compounds (VOCs). Emissions of hydrocarbons (HC), NO_2, and PM_{10} come from both mobile and stationary sources. Emissions of SO_2 and Pb are associated mainly with stationary sources.

Criteria pollutants measured in La Plata County as well as their corresponding NAAQS are shown in Table 3.9-1.

Table 3.9-1
2003 Criteria Pollutants Measured in La Plata County

Criteria Pollutant	CO		NO_2	O_3		SO_2[1]	
Period	**1-hr**	**8-hr**	**Annual**	**1-hr**	**8-hr**	**24-hr**	**Annual**
Units	**(ppm)**	**(ppm)**	**(ppm)**	**(ppm)**	**(ppm)**	**(ppm)**	**(ppm)**
Standard	35	9	0.053	0.12	0.08	0.14	0.03
La Plata County	---	---	0.009	0.074	0.062	---	---
Criteria Pollutant	$PM_{2.5}$		PM_{10}		Pb		
Period	**24-hr**	**Annual**	**24-hr**	**Annual**	**Quarterly Average**		
Units	**($\mu g/m^3$)**	**($\mu g/m^3$)**	**($\mu g/m^3$)**	**($\mu g/m^3$)**	**($\mu g/m^3$)**		
Standard	65	15	150	50	1.5		
La Plata County	14	6.3	72	37	---		

Acronyms: [1] SO_x is measured as SO_2 in the table ppm: parts per million $\mu g/m^3$: Micrograms per cubic meter

Currently, La Plata County is in attainment for all USEPA criteria pollutants.

Air Toxics

In addition to the NAAQS set forth by USEPA for the six criteria pollutants, USEPA has also identified 188 chemicals and compounds known as Hazardous Air Pollutants (HAPs). These HAPs pose a threat to human health in the largest urban areas; however, unlike the NAAQS, there are no federal or state standards regulating the concentrations of HAPs in ambient air. Included in the list of 188 HAPs are 21 compounds known as Mobile Source Air Toxics (MSATs) because they are emitted by on-highway vehicles and off-road or non-road engines. The MSATs are shown in Table 3.9-2.

Table 3.9-2
Mobile Source Air Toxics

Acetaldehyde	Diesel Particulate Matter + Diesel Exhaust Organic Gases (DPM + DEOG)	MTBE
Acrolein	Ethylbenzene	Naphthalene
Arsenic Compounds	Formaldehyde	Nickel Compounds
Benzene	n–Hexane	POM
1,3-Butadiene	Lead Compounds	Styrene
Chromium Compounds	Manganese Compounds	Toluene
Dioxin/Furans	Mercury Compounds	Xylene

Acronyms: MTBE: Methyl Tertiary Butyl Ether POM: polycyclic organic matter

These HAPs, also known as urban air toxics, are those pollutants that cause or may cause cancer, reproductive, developmental, respiratory, and immunological problems, as well as other serious health problems and adverse ecological effects. Most air toxics originate from human-made sources, including on-road mobile sources (e.g., cars, trucks, buses), non-road mobile sources (e.g., airplanes, lawnmowers, etc.), and stationary sources (e.g., factories, refineries, power plants), as well as indoor sources (e.g., building materials). Some air toxics are also released from natural sources such as volcanic eruptions and forest fires.

Colorado has 7 HAP monitoring sites, mostly in the Denver metro area. As with the criteria pollutants, not all HAPs or MSATs are monitored at each location. The 2003 monitored values for the available MSATs in Colorado Springs and Denver are shown in Table 3.9-3. Concentrations of MSATs in La Plata County would not be expected to be greater than these two areas.

Table 3.9-3
2003 MSATs Monitored in the Denver Area

	Colorado Springs			Denver Metro		
Pollutant	Max	Mean	Units	Max	Mean	Units
Acetaldehyde			PpbC	6.1	3.87	ppbC
Arsenic (TSP)	0.004	0.0014	µg/m3	0.01	0.001	µg/m3
Benzene (including benzene from gasoline)	---	---	PpbC	9.8	5.14	ppbC
1,3-Butadiene			PpbC	1	0.46	ppbC
Chromium (TSP)	0.007	0.0013	µg/m3	0.01	0.005	µg/m3
Ethylbenzene	---	---	PpbC	4.3	2.23	ppbC
Formaldehyde	---	---	PpbC	8.2	5.06	ppbC
Lead (TSP)	0.03	0.008	µg/m3	0.08	0.021	µg/m3
Manganese (TSP)	0.052	0.0036	µg/m3	0.11	0.031	µg/m3
Methyl tert-butyl ether	---	---	PpbC	0.25	0.25	ppbC
Mercury	0.006	0.0025	µg/m3	---	---	µg/m3
Nickel (TSP)	0.002	0.0008	µg/m3	0	0	µg/m3
Styrene	---	---	PpbC	2.7	0.66	ppbC
Toluene	---	---	PpbC	30.1	13.12	ppbC
o-Xylenes	---	---	PpbC	5.4	2.93	ppbC

Acronyms: $\mu g/m^3$: Micrograms per cubic meter TSP: total suspended particulates ppbC: parts per billion carbon

In March 2001, USEPA issued regulations for the producers of urban air toxics to decrease the amounts of these pollutants by target dates in 2007 and 2020. Under these regulations, between 1990 and 2020, on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde would be reduced by 67 to 76 percent, and on-highway diesel particulate matter emissions would be reduced by 90 percent. These reductions are attributable to several national mobile source emissions control programs, including the reformulated gasoline program, a new cap on the toxics content of gasoline, the national low-emission vehicle standards, the Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and the heavy-duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. These are net emissions

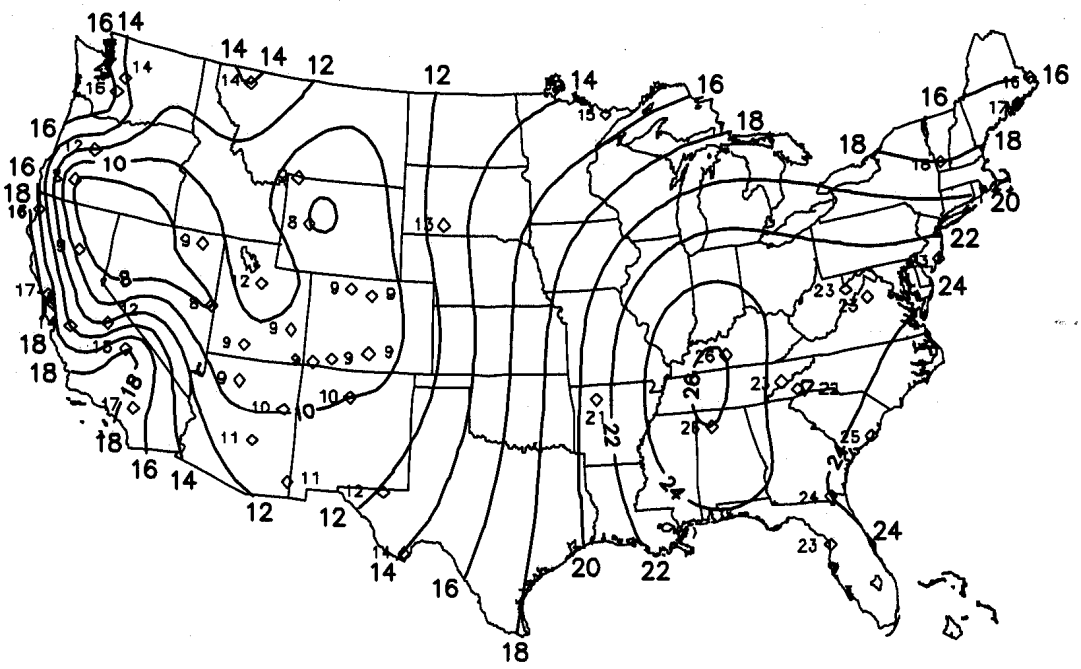
reductions that would be experienced even after growth in nationwide vehicle miles traveled (VMT) is taken into account.

Regional Haze/Visibility

Emissions from mobile sources, including highway motor vehicles, trains, aircraft, and non-road vehicles such as snowmobiles and all-terrain vehicles (ATVs), contribute to visibility degradation throughout the country. The CAA requires states to protect visibility and reduce visibility impairments in 156 "Class I" areas in the United States. Class I areas are defined as National Parks and Wilderness Areas over a certain size that were in existence as of August 1997. There are 12 Class I areas in Colorado; the closest to this project are the Mesa Verde National Park (40 miles west) and Weminuche Wilderness Area (20 miles northeast).

Figure 3.9-1 shows average deciview values in the United States taken over a period from March 1996 through February 1999. By using the deciview scale, the effect of light extinction on visibility is portrayed in a way that is approximately linear with respect to perceived visual air quality.

Figure 3.9-1 - Averages of Deciview Values



Source: Spatial and Seasonal Patterns and Temporal Variability of Haze and its Constituents in the United States: Report III

Pristine conditions correspond to a deciview value of zero. The data is currently updated every three years.

3.9.2 Environmental Consequences

Impacts Specific to No Action

Ambient Air Standards

Traffic projections indicate doubled traffic volumes within the project area between present day and 2025. Although traffic volumes and congestion of US 550 are projected to increase by the year 2025 with or without roadway improvements, motor vehicle emissions would continue to decrease as older vehicles are replaced with newer, less-polluting vehicles.

The NAAQS for PM_{10} is both an annual standard of 50 $\mu g/m^3$ and a 24-hour standard of 150 $\mu g/m^3$. As shown in Table 3.9-1, La Plata County's current PM_{10} concentrations are 72 and 37 $\mu g/m^3$ for the annual and 24-hour standards respectively. No violations of the annual or 24-hour PM_{10} standards are anticipated in the project area under the No Action Alternative.

Air Toxics

Unlike the NAAQS, there are no federal standards regulating the concentrations of HAPs or MSATs in ambient air. USEPA has not yet determined how to evaluate the impacts of roadways on ambient concentrations of urban air toxics. Currently, there are no established models or accepted techniques to determine the significance of localized concentrations of MSATs near roadways or of changes in MSAT emissions due to changes in VMT associated with new roadways. However, under the No Action Alternative, ambient concentration of urban air toxics in the project area should decline over time per implementation of USEPA's national MSAT control programs.

Regional Haze/Visibility

Visibility in the project area has been measured at 9 deciview as shown in Figure 3.9-1. Although traffic volumes and congestion of US 550 are projected to increase by the year 2025 USEPA-mandated improvements in vehicle emissions technology over the next 20 years would reduce emissions regardless of the alternative chosen, resulting in visibility improvements.

Impacts Common to All Action Alternatives

Ambient Air Standards

Similar to the No Action Alternative, despite increased traffic volumes on US 550, levels of CO and other criteria pollutants would continue to decrease as older vehicles are replaced with newer, less-polluting vehicles. The proposed US 550 road improvements are expected to lead to decreased congestion, decreased idling times, and fewer potential CO "Hot-Spots." No violations of the CO standard are anticipated.

The NAAQS for PM_{10} is both an annual standard of 50 $\mu g/m^3$ and a 24-hour standard of 150 $\mu g/m^3$. Increased particulate matter emissions would result from construction activities. However, PM_{10} emissions resulting from construction activities would be of a

temporary nature and end once construction activities cease. Particulate emissions from construction activities are not expected to violate the annual or 24-hour PM_{10} standard.

Air Toxics

Without established USEPA standards and accepted analytical methods, it is difficult to determine the specific impacts or contribution of the proposed US 550 improvements to urban air toxics. With the information currently available, FHWA and CDOT can conclude that: (1) localized concentrations of MSATs in the vicinity of the US 550/CR 220 intersection and along US 550 would be similar to those experienced by individuals, residences, businesses, and other facilities located at similar distances from similar corridors; and (2) regardless of the alternative selected, MSAT emissions in the project area should decrease over time as a result of USEPA's national MSATs control programs.

Regional Haze/Visibility

Increased emissions from travel on US 550 in future years are incorporated into the state's visibility plan, which is required by federal law to demonstrate the necessary visibility improvements in Class I areas. Given the small incremental impact of this project and the large-scale nature of visibility transport, it is not practical to model the regional haze and visibility impact differences of the individual action alternatives. However, due to the distance, location, and terrain between the Class I areas and the US 550 project, none of the proposed action alternatives are expected to noticeably affect visibility or regional haze in the area. Additionally, USEPA-mandated improvements in vehicle emissions technology over the next 20 years would reduce emissions regardless of the alternative chosen, resulting in visibility improvements. Short-term localized visibility impacts adjacent to construction staging areas are likely to take place due to increased PM_{10} emissions during construction.

Impacts Specific to Alternative 1

Alternative 1 would not have air quality impacts beyond those discussed that are common to all action alternatives.

Impacts Specific to Alternative 2 (Preferred Alternative)

Alternative 2 would not have air quality impacts beyond those discussed that are common to all action alternatives.

Impacts Specific to Alternative 3

Alternative 3 would not have long-term air quality impacts beyond those discussed that are common to all action alternatives. However, due to approximately 16 to 20 acres of additional vegetation clearing and surface disturbance, Alternative 3 would have short-term increased fugitive dust emissions as compared to Alternatives 1 and 2.

3.9.3 Mitigation Measures (Preferred Alternative)

Issue A-1: Increased particulate emissions during construction activities may cause temporary localized visibility impacts.

Mitigation Measure A-1: Watering or other fugitive dust control methods will be employed to reduce fugitive dust. Additionally, construction staging areas will be located at least 200 meters from the nearest residence or business.

Effectiveness: This measure would reduce the particulate emissions approximately 25 to 50 percent, depending on the frequency of the application, during construction activities and locate fugitive dust sources at a distance from receptors sufficient to decrease the likelihood of localized impacts from fugitive dust (CDPHE Air Division).

3.9.4 Residual Adverse Effects

Fugitive dust and particulate matter emissions would occur from construction activities, but due to the use of established control methods and careful placement of staging areas, fugitive dust emissions are not anticipated to violate annual or 24-hour PM_{10} standards.

3.10 PALEONTOLOGY

3.10.1 Existing Environment

Paleontological files searches at the University of Colorado Museum and Denver Museum of Nature and Science were performed, records and geologic maps were reviewed, and a field reconnaissance was conducted for the US 550 study area. No significant paleontological localities were identified within the study area during any of these activities.

Four geologic units occur in the study area. The bedrock units include the Animas and Nacimiento Formations, both of Paleocene age. The surficial deposits include two terrace complexes of Pleistocene age. The rock outcrops are restricted to the southern part of the area. North of Bondad Hill the highway lies upon thick Quaternary deposits on Florida Mesa, and no outcrops occur along the ROW.

Three potentially fossiliferous geologic units occur in the study area. Two are the Paleocene Upper Animas Formation and its lateral equivalent, the Nacimiento Formation. The third is fine-grained deposits above Pleistocene gravel deposits.

A field survey of the rock outcrops of the Nacimiento Formation and exposed Pleistocene gravel deposits was made on October 21 and 22, 2003. All outcrops along road and stream cuts in and adjacent to the study corridor were examined for fossils. The route of Alternative 3 was also surveyed to determine if outcrops occurred along this route.

3.10.2 Environmental Consequences

Impacts Specific to No Action

There would be no impacts to paleontological resources under the No Action Alternative because no excavation would occur along the corridor.

Impacts Common to All Action Alternatives

None of the alternatives would likely impact any significant paleontological resources. However, due to the occurrence of fossiliferous geologic units within the project area there is a slight potential to encounter and impact paleontological resources during construction of any alternative.

Impacts Specific to Alternative 1

Alternative 1 would not have paleontological impacts beyond those discussed that are common to all action alternatives. Two retaining walls, one above the roadway and one below, would be included as part of the design for Alternative 1. These retaining walls would have impacts to depths up to an additional 60 feet for retaining wall construction in the vicinity of Bondad Hill. Due to the occurrence of fossiliferous geologic units within the project area there is a slight increased potential under Alternative 1, based on the depth of disturbance from the retaining wall, to impact paleontological resources during construction.

Impacts Specific to Alternative 2 (Preferred Alternative)

Alternative 2 would not have paleontological impacts beyond those discussed that are common to all action alternatives. Two retaining walls, one above the roadway and one below, would be included as part of the design for Alternative 2. These retaining walls would have impacts to depths up to an additional 60 feet for retaining wall construction in the vicinity of Bondad Hill. Due to the occurrence of fossiliferous geologic units within the project area there is a slight increased potential under Alternative 2, based on the depth of disturbance from the retaining wall, to impact paleontological resources during construction.

Impacts Specific to Alternative 3

Alternative 3 would not have paleontological impacts beyond those discussed that are common to all action alternatives. However, due to approximately 16 to 20 acres of additional excavation and surface disturbance, Alternative 3 would have increased potential for impacting paleontological resources as compared to Alternatives 1 and 2.

3.10.3 Mitigation Measures (Preferred Alternative)

Issue P-1: Paleontological resources may be impacted by excavation activities although none were found during field visits.

Mitigation Measure P-1: If paleontological resources are uncovered during the construction of the Preferred Alternative, construction operations in the area of the discovery shall cease and the CDOT staff paleontologist will be notified to assess their scientific importance. If the paleontological resources are found to be scientifically important, avoidance and collection procedures will be established prior to reinitiating construction activities in the area.

Effectiveness: Measure P-1 would result in the minimization of significant impacts to important palonotological resources that may be encountered during construction.

3.10.4 Residual Adverse Impacts

No residual adverse impacts are anticipated.

3.11 LAND USE

3.11.1 Affected Environment

Existing Conditions

Land Classifications

The project area has rural characteristics, with US 550 being utilized primarily by commuters between Aztec, New Mexico, and Durango, Colorado. Most of the land within or adjacent to the proposed action alternatives is classified as agricultural/rural residential or Southern Ute Indian Reservation Tribal land, with scattered commercial operations and utilities. Besides the Tribal lands, no other federal- or state-owned lands are located within the project area. Information on land use classifications was gathered from La Plata County Assessor records and planning documents, including the 1999 *La Plata County Comprehensive Traffic Study*, the 1998 *Florida Mesa District Land Use Plan*, the 2001 *La Plata County Comprehensive Plan*, the SUIT, and a local site reconnaissance. The following section was written based on the information contained in these reports.

Residential

Residential land is defined for this study as single-family homes and multifamily complexes (including apartment complexes, recreational vehicle (RV) parks, and mobile home parks). Lands classified as rural residential comprise a large portion of the project area. An area of Suburban Density Residential (maximum density of two lots per acre) exists near Sunnyside Elementary School, located near the intersection of US 550 and CR 218.

CR 215 provides access to five subdivisions west of US 550. A pocket of Medium Density Residential (up to six units per acre) exists at the Old Homestead Mobile Home Park, on the west side of US 550 near Sunnyside Elementary School. Sunnyside Apartments are also located on the Old Homestead Mobile Home Park property.

The Durango RV Park, located near MP 8.5 on the west side of US 550, contains 39 spaces and includes five mobile homes with permanent residents. Seasonal or transient residents, including construction workers and surveyors use the remainder of the RV park.

Commercial

Thirty-two businesses were identified along the US 550 highway corridor and other roads accessed from the highway. For this study, a "business" is considered to be an entity other than a single-family home or multifamily complex, including fire stations, schools, and various oil and gas operations. Businesses were identified through field

investigations (including advertising signs visible from the highway) and by examining La Plata County Assessor records.

Two small nodes classified as Local Commercial exist near Sunnyside Elementary School and Old Homestead Mobile Home Park. Several additional commercial buildings are scattered throughout the project corridor and include businesses such as retail stores and restaurants, fire district buildings, a school, and a church.

Federal and Indian Tribal Lands

Portions of the Southern Ute Indian Reservation are located within the project corridor. The reservation consists of scattered parcels throughout the southern portion of La Plata County and abuts US 550 in several locations along the southern half of the project corridor. The ROW for US 550 crosses part of the reservation at three locations between the New Mexico state line and the top of Bondad Hill. The SUIT does not have specific development plans for this area (SUIT 2003a).

Agricultural Lands

Historically, agriculture has been the predominant land use in the rural parts of La Plata County, although agriculture is a small component of the county's economy. According to the USDA National Agricultural Statistics Service's Colorado Agricultural Census for 1997 (Colorado Department of Agriculture 1997), there were 781 farms and ranches covering 580,135 acres of land in farms in La Plata County in 1997. This is a decrease of 1.2 percent from 587,339 acres in 1992. The average size of farms decreased 11.4 percent from 828 acres in 1992 to 743 acres in 1997. Crops include barley, corn for grain, dry beans, alfalfa hay, oats, potatoes, sorghum, sugar beets, sunflowers, and spring and winter wheat. Farmlands and associated agricultural impacts are discussed further in Section 3.11, *Farmland*.

Recreation/Education

There are several existing recreational or educational facilities or properties located in the US 550 corridor vicinity, including:

- Sunnyside Elementary School, which has a playground and ball field located in the back of the school, away from the US 550 project corridor.
- Southern Ute Tribal Waters, which provides access to the Animas River on Tribal land for Tribal fishing license holders. There are no SUIT facilities other than an interpretive sign adjacent to the highway and parking near the river.
- Durango Nature Studies, which owns a 140-acre parcel near the US 550 and CR 318 intersection and conducts interpretive nature tours. Facilities include a pavilion, portable toilet, "habitat" playground, and nature trails. Long-range plans include constructing an interpretive center building, an amphitheater, and interpretive gardens.
- A parcel northwest of the US 550 and CR 318 intersection, which is used by rafting companies and fishing guides as a takeout for boats on the Animas River as part of

all-day trips. Fishing guides occasionally launch boats at this site and takeout at Cedar Hill, New Mexico.

Future Conditions

Local land use plans and development trends would affect the future growth and use of land along the US 550 corridor from CR 220 at the top of Farmington Hill to the New Mexico state line. Future land use plans and trends are described in detail to provide a baseline from which project-specific and cumulative impacts from the highway project can be determined.

La Plata County completed and adopted land use plans for planning districts within the county. The *Florida Mesa District Land Use Plan* (La Plata County 1998) covers the entire project area. This land use plan designates land use categories such as Mixed Use, Office/Light Commercial, and Agricultural/Rural Residential. Defined within each of these categories are the allowable land uses such as retail businesses, mobile home parks, single-family or multi-family residences, warehouses, and schools, as well as residential density restrictions. La Plata County has prepared a comprehensive plan, adopted in December 2001, which links the various district plans together to form a countywide perspective.

Future land use plans and development trends are described for the immediate project area, within and adjacent to the highway corridor, and for the entire county.

Future Land Use in La Plata County

The population of La Plata County has increased substantially from 1980 to 2000, resulting in additional residential and commercial development. While some of the increased population would probably be housed in subdivisions not yet created, many new residences would be built on existing lots that have already been subdivided or on vacant agricultural lots. La Plata County has a large inventory of such lots, approximately 10,300, which should be more than enough to accommodate Colorado Demography Section (CDS)-projected population growth through 2025. Approximately 8,000 vacant lots are located within existing subdivisions. If a single-family residence, with an average household size of 2.5 people, were built on each of these lots, nearly 26,000 people could be accommodated.

Future commercial growth is projected to occur within or adjacent to the three municipalities – Durango, Bayfield, and Ignacio – with the exception of continued development near the Durango-La Plata County Airport. Urbanizing areas adjacent to these communities, including the Grandview area, are likely to be annexed as new commercial and higher density residential development occurs. The present mix of economic sectors, dominated by the retail trade and service sectors, is expected to remain relatively stable during the next 20 years. New square footage for commercial development is likely to expand in proportion to increased population.

Future Land Use Within and Adjacent to the Highway Corridor

Building on existing land use patterns, the *Florida Mesa District Land Use Plan* (La Plata County 1998) recommends the preservation of the rural character of the US 550

corridor. One of the stated goals of the *La Plata County Comprehensive Plan* (La Plata County 2001) is to "encourage growth hubs in the county that would provide opportunities for higher density commercial and residential development and employment centers." The plan identifies Bondad as a growth hub. The plan also encourages clustering as a method to preserve rural character and open space, including the use of significant minimum setbacks from roadways and vegetation to screen houses from view.

3.11.2 Environmental Consequences

Direct impacts were determined by overlaying the anticipated limit of construction disturbance onto the parcel maps within the corridor. Each of the properties was analyzed to determine if acquisition was necessary and if the acquisition would displace a residence, business, community facility, or other use. In addition, changes to existing access and ROW changes were evaluated. Land use impacts include full impacts (relocations and acquisitions) and partial impacts (ROW acquisitions and access changes). Indirect impacts caused by changed access and visibility from the highway may occur to all land use types. The following sections describe specific direct land use impacts for each highway segment and alternative.

Impacts Specific to No Action

Existing land uses would continue until they are altered or replaced by other land uses in response to market forces and community expansion pressures. Community expansion is likely to result in an increase in residential development on large lots (10 to 20 acres), which may replace some agricultural land, or on smaller lots that are already platted. No directs impacts to land use types as a result of the No Action Alternative are anticipated.

Impacts Common to All Action Alternatives

Property acquisition and relocation may be required when highway improvements necessary for safety or capacity cannot be built without affecting private or public property. However, during preliminary design of this project, efforts were made to avoid and minimize property impacts. For example the alignment is set east of the centerline in the northern segment to avoid impacts to homes. If the potential relocations described in this EA cannot be avoided during final design, CDOT would follow specific procedures to provide relocation assistance when real property acquisition is required for construction (see Section 3.11.3 *Mitigation Measures*).

The project would require relocating individual residences and business. While such relocations may affect individual property owners, the general land use patterns in the corridor would not change. While the use of some individual parcels would be altered under each of the three alternative alignments, the basic character of land uses adjacent to the ROW would not be directly impacted. Most of the highway corridor is likely to remain rural or agricultural.

All of the proposed impacts are compatible with current or proposed planning documents and policies. The *Florida Mesa District Land Use Plan* generally calls for a continuation of existing rural land uses along the highway corridor. As discussed above, impacts to residences and businesses would not alter the basic character of the highway corridor. Improvements to US 550 may have long-range indirect impacts on businesses, residences, agricultural operations, and vacant parcels.

Full-movement intersections would generally be located 1 mile apart. The existing two-lane highway allows direct access to most parcels from northbound and southbound directions. The proposed four-lane roadway, with a median or barrier separating northbound and southbound lanes, would allow right-in and right-out traffic only, except at full-movement intersections. Thus, access to some parcels would require a U-turn and "doubling back," depending on direction of travel, resulting in longer driving distances.

Table 3.11-1 shows the direct impacts to land use types for all action alternatives.

Table 3.11-1
Land Use Impacts – All Alternatives

Land use Type	Residential			Commercial			Vacant / undeveloped land	Tribal land
	Number of Relocations	**Acres of impact (no relocations)**	**Number of properties with access changes**	**Number of Relocations**	**Acres of impact (no relocations)**	**Number of properties with access changes**	**Acres of impact**	**Acres of impact**
Impacts Common to All Alternatives	**8**	**77**	**33**	**2**	**4**	**4**	**0.11**	**6**
Additional impacts from Alternative 1	4	17	21	1	2	4	20	3
Total Alternative 1	**12**	**94**	**54**	**3**	**6**	**8**	**20.11**	**9**
Additional Impacts from Alternative 2	4	17	21	1	2	4	19	4
Total Alternative 2	**12**	**94**	**54**	**3**	**6**	**8**	**19.11**	**10**
Additional Impacts from Alternative 3	2	24	23	1	1	3	37	18
Total Alternative 3	**10**	**101**	**56**	**3**	**5**	**7**	**37.11**	**24**

Recreation/ Educational Impacts

Under all action alternatives, proposed improvements to US 550 would generally have a beneficial impact on recreation facilities and activities as described below:

- Access to the Sunnyside Elementary School would become safer with turning lanes and acceleration/deceleration lanes. Construction of the highway improvements may provide an opportunity to construct a safe pedestrian crossing to the school from residences on the west side, and which includes a large concentration of children at Old Homestead Mobile Home Park.
- A limited-access highway would result in additional driving distances for northbound traffic to the SUIT fishing access on the Animas River. However, highway improvements are not expected to adversely impact visitation, as it is a destination only for individuals who have obtained a fishing license from the Tribe (SUIT 2003b).
- Access to Durango Nature Studies would be altered, as the US 550 and CR 318 intersection would be moved to the south, resulting in a safer and more efficient access for visitors, including children transported by school bus.
- An improved intersection at US 550/CR 318 would provide safer egress for vehicles transporting rafts from the takeout used by rafting companies and fishing guides. Also, a four-lane highway would allow other vehicles to safely pass these vehicles as they attempt to accelerate after entering the highway at the bottom of Bondad Hill.
- An improved highway with a wide shoulder that also serves as a bikeway would greatly improve safety for cyclists, who now share a roadway that has minimal or no shoulders with motorized traffic.

The following sections describe the direct impacts to land use types by alternative.

Impacts Specific to Alternative 1

Total impacts to land use from Alternative 1 are presented in Table 3.11-1. A total of 3 small businesses and 12 residential units would be relocated. Of the 12 residential units, 4 are on large lots, which may allow for relocating the residence on the same property, while the other 8 are on smaller parcels that do not allow of relocating residence on the same property.

Impacts Specific to Alternative 2

Alternative 2 differs from Alternatives 1 and 3 only between MPs 3.1 and 6.6. Total impacts to land use for Alternative 2 are presented in Table 3.11-1. A total of 3 small businesses and 12 residential units would be relocated. Of the 12 residential units, 4 are on large lots, which may allow for relocating the residence on the same property, while the other 8 are on smaller parcels that do not allow of relocating the residence on the same property.

Impacts Specific to Alternative 3

Alternative 3 differs from Alternatives 1 and 2 only between MPs 3.1 and 6.6. Total impacts to land use from Alternative 3 are presented in Table 3.11-1. A total of 3 small businesses and 10 residential units would be relocated. Of the 10 residential units, 4 are on large lots, which may allow for relocating the residence on the same property, while the other 6 are on smaller parcels that do not allow of relocating the residence on the same property.

3.11.3 Mitigation Measures (Preferred Alternative)

Issue L-1: Under the Preferred Alternative, 3 small businesses and 12 residential units would require relocation.

Mitigation Measure L-1: If the impacts described in this EA cannot be avoided during final design, acquisition and relocation will be conducted in accordance with will the Uniform Act. CDOT and FHWA will provide relocation assistance and payment for residential, businesses, farms, and nonprofit organizations displaced persons without discrimination. When applicable, all qualified relocatees shall receive monetary payments, which may include payments for moving expenses, business in lieu of payment, rent supplements, down payments, and increased interest payments.

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), as amended by the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17) (Uniform Act) requires that a property owner be notified of CDOT's interest in acquiring his or her property before a real property appraisal is completed. If an appraisal is conducted, each property owner shall be given the opportunity to accompany the appraiser during the inspection of his or her property. CDOT must then establish just compensation based on a current appraisal. The owner of real property acquired for ROW will be compensated at market value, in accordance with the Uniform Act, state statutes, and CDOT policies and procedures. No owner shall be required to surrender possession of the real property until paid the agreed purchase price or the amount deemed to be just compensation has been deposited with the court for the benefit of the owner.

Effectiveness: The relocation assistance described would minimize the disruption of moving and maximize the likelihood of successful relocations.

3.11.4 Residual Adverse Impacts

The project would require relocating 12 individual residences and 3 businesses. Additionally, 56 residences and 7 businesses would require changes in access. Twenty-four acres of Tribal lands would be affected.

3.12 FARMLAND

The Farmland Protection Policy Act (FPPA) of 1981, as amended, protects prime and unique farmlands from being converted to non-agricultural uses by requiring federal agencies to consider the adverse effects of federally-funded projects on these farmlands.

According to the FPPA, federal agencies must comply with local farmland programs and policies.

Prime and Statewide Important Farmland, as defined by the NRCS, were mapped within the extent of the alternatives, 500 feet from the centerline of the existing highway, plus an expanded study area at Bondad Hill. The prime farmland map supplied by NRCS and the soils survey for La Plata County (1981), supplemented with field observations of current conditions, was used to identify prime, unique, and irrigated farmland in the project area.

NRCS uses a land evaluation and site assessment system to establish a farmland conversion impact rating score on proposed sites of federally funded and assisted projects. This score is used as an indicator for the project sponsor to consider alternative sites if the potential adverse impacts on the farmland exceed the recommended allowable level.

The assessment is completed on form AD-1006, Farmland Conversion Impact Rating (included in Appendix J). The sponsoring agency completes the site assessment portion of the AD-1006, which assesses non-soil related criteria such as the potential for impact on the local agricultural economy if the land is converted to non-farm use and compatibility with existing agricultural use. Form AD-1006 was completed and sent to the NRCS office in Durango for determination of prime and statewide important farmland based on their knowledge of the area, including what land is currently being irrigated. Prime and Statewide Important Farmlands identified by NRCS were then mapped in GIS and impacts were calculated.

3.12.1 Affected Environment

NRCS has established four different classifications of farmlands, including Prime Farmlands, Statewide Important Farmlands, Unique Farmlands, and Local Important Farmlands. Of these, only Prime and Statewide Important Farmlands occur within the study area.

Prime Farmland is defined as:

> "…land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses (the land could be cropland, pastureland, rangeland, forest land, or other land, but not urban built-up land or water). It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks." (CEQ, 2003)

Statewide Important Farmland is defined as:

> "…land, in addition to prime and unique farmlands, that is of statewide importance for the production of food, feed, fiber, forage, and oilseed crops. Criteria for defining and delineating this land are to be determined by the appropriate State agency or agencies. Generally, additional farmlands of statewide importance include those that

> are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce as high a yield as prime farmlands if conditions are favorable" (CEQ, 2003).

La Plata County has more than 339,831 acres of irrigated cropland and pasture (NRCS 2004). A land use inventory of the study area revealed approximately 247.2 acres of Prime Farmland and 743.2 acres of Statewide Important (irrigated) Farmland scattered throughout the project area (Figures 3.12-1 to 3.12-5).

3.12.2 Environmental Consequences

Impacts Specific to No Action

There would be no impacts to farmlands as a result of the No Action Alternative since there would be no construction.

Impacts Common to All Action Alternatives

All action alternatives would result in the loss of approximately 14.74 acres of Prime Farmland or 6.0 percent of the total acreage of this type of land in the study area. In addition, the construction of any action alternative would result in the loss of approximately 64.18 acres of Statewide Important Farmland or 8.6 percent of the total acreage of this type of land in the study area. This acreage includes two farms irrigated by center-pivot irrigation; one farm is designated as Statewide Important Farmland and one farm is designated as Prime Farmland. Impacts to prime and irrigated farmlands have been minimized through the design of the proposed highway corridor, which has emphasized maintaining the existing alignment as much as possible while meeting the purpose and need of the project.

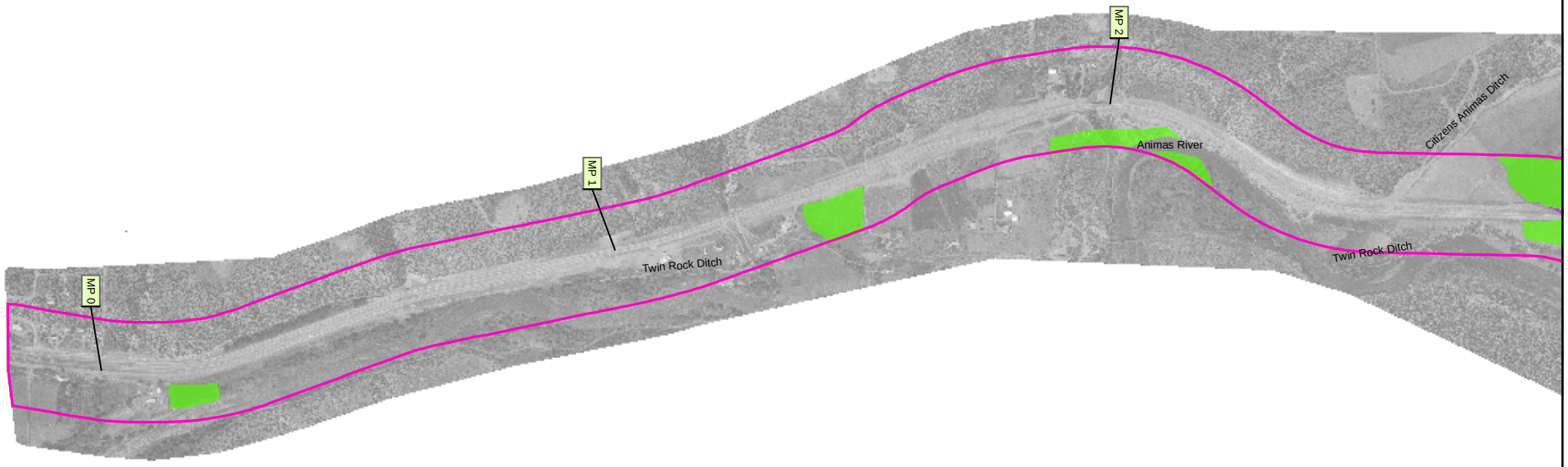
Farm accesses may be affected and moved, however no access would be lost. Future farm access would be permitted per the CDOT Access Code (CDOT 2002b).

Impacts Specific to Alternative 1

Under Alternative 1, an additional 14.6 acres of Prime Farmland (5.9 percent of total acreage of this type of land in the study area) would be impacted by construction of this alignment. Approximately 4.1 additional acres of Statewide Important Farmland (0.6 percent of total acreage of this type of land in the study area) of Statewide Important Farmland would be impacted by construction of this alignment. The total of 29.3 acres of Prime Farmland and 68.2 acres of Statewide Important Farmland potentially impacted by this alignment would have a negligible effect on overall resources of irrigated land when compared to the 339,831 acres in the region.

Impacts Specific to Alternative 2 (Preferred Alternative)

Under Alternative 2, an additional 14.6 acres (5.9 percent of total acreage in study area) of Prime Farmland would be impacted by construction of this alignment. Approximately 4.2 additional acres (0.6 percent of total acreage in study area) of Statewide Important Farmland would be impacted by construction of this alignment. The total of 29.3 acres of Prime Farmland and 68.4 acres of Statewide Important Farmland potentially impacted by



Legend

Farmland Study Area

Farmlands

Irrigated

Prime

1,000 500 0 1,000 2,000 Feet

US 550 EA

Prime and Irrigated Farmland from MP 0 to MP 2.9 Figure 3.12-1

02/04/05

To and From MP Distances Are Approximate

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Legend

Farmland Study Area

Farmlands

Irrigated

Prime

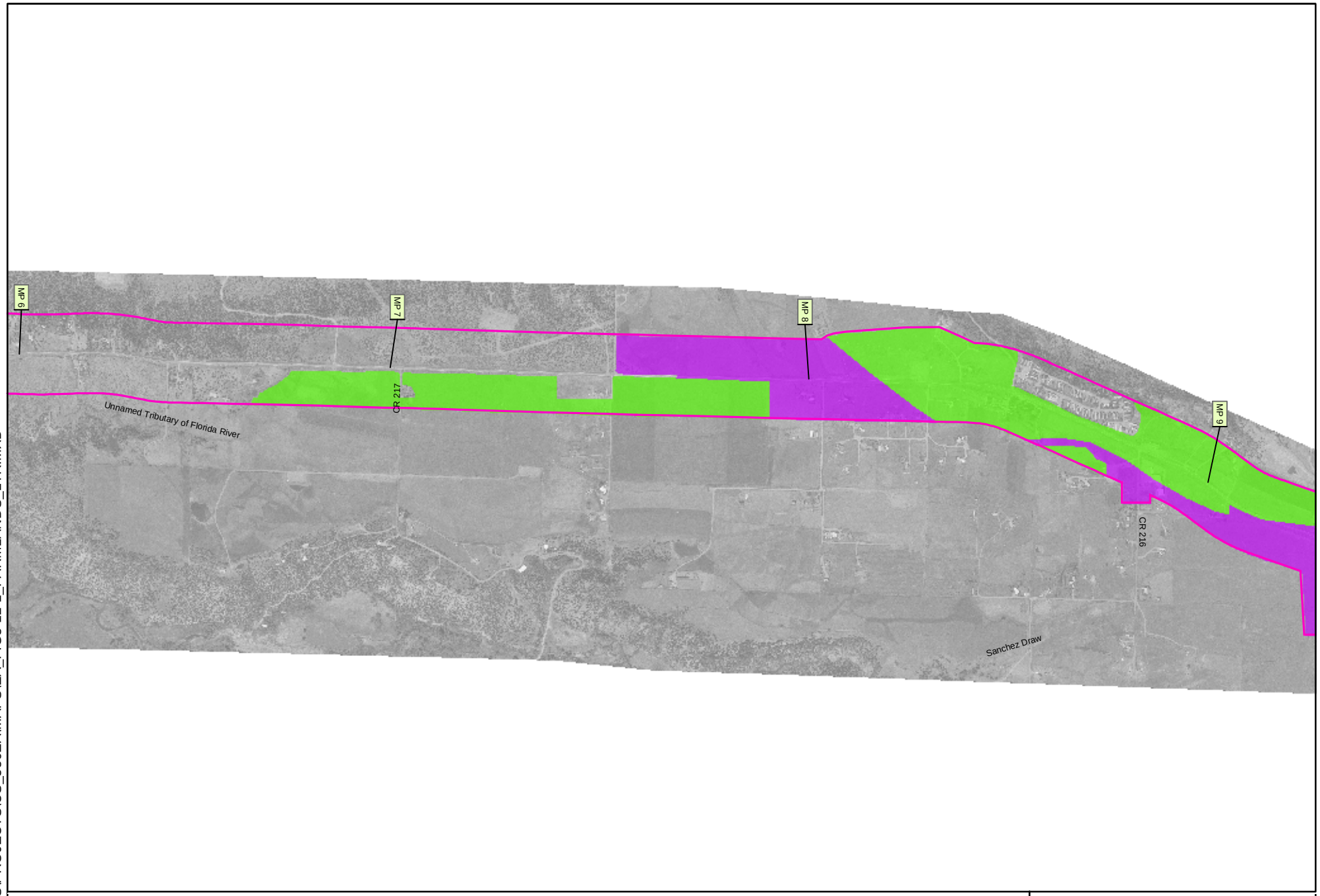
1,000 500 0 1,000 2,000 Feet

US 550 EA

Prime and Irrigated Farmland from MP 2.9 to MP 6.0 Figure 3.12-2

02/04/05

To and From MP Distances Are Approximate



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Legend

US 550

Farmland Study Area

Farmlands

Irrigated

Prime

1,000 500 0 1,000 2,000 Feet

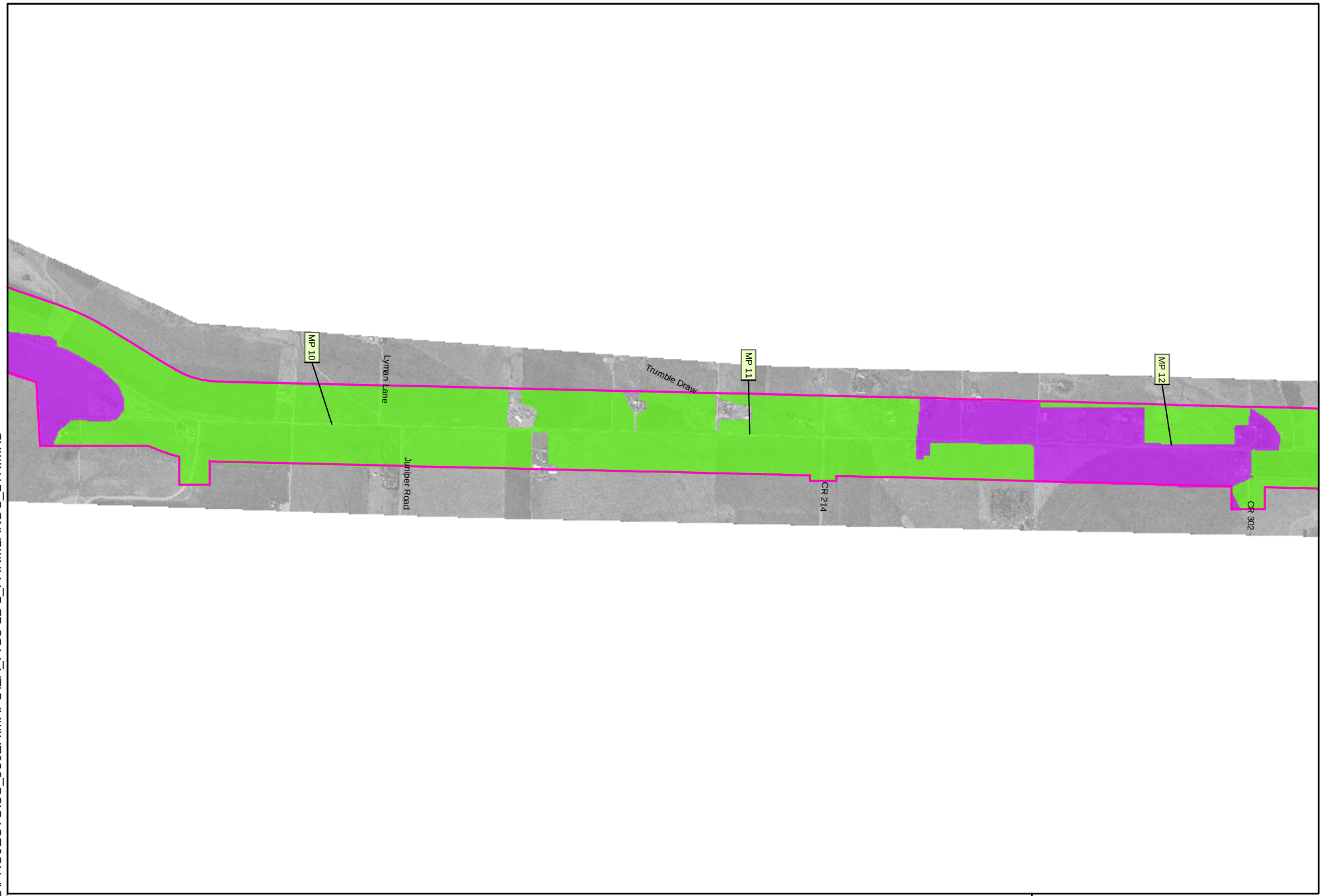
DOT

US 550 EA

Prime and Irrigated Farmland from MP 6.0 to MP 9.3 Figure 3.12-3

02/04/05

To and From MP Distances Are Approximate



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Legend

Farmland Study Area

Farmlands

Irrigated

Prime

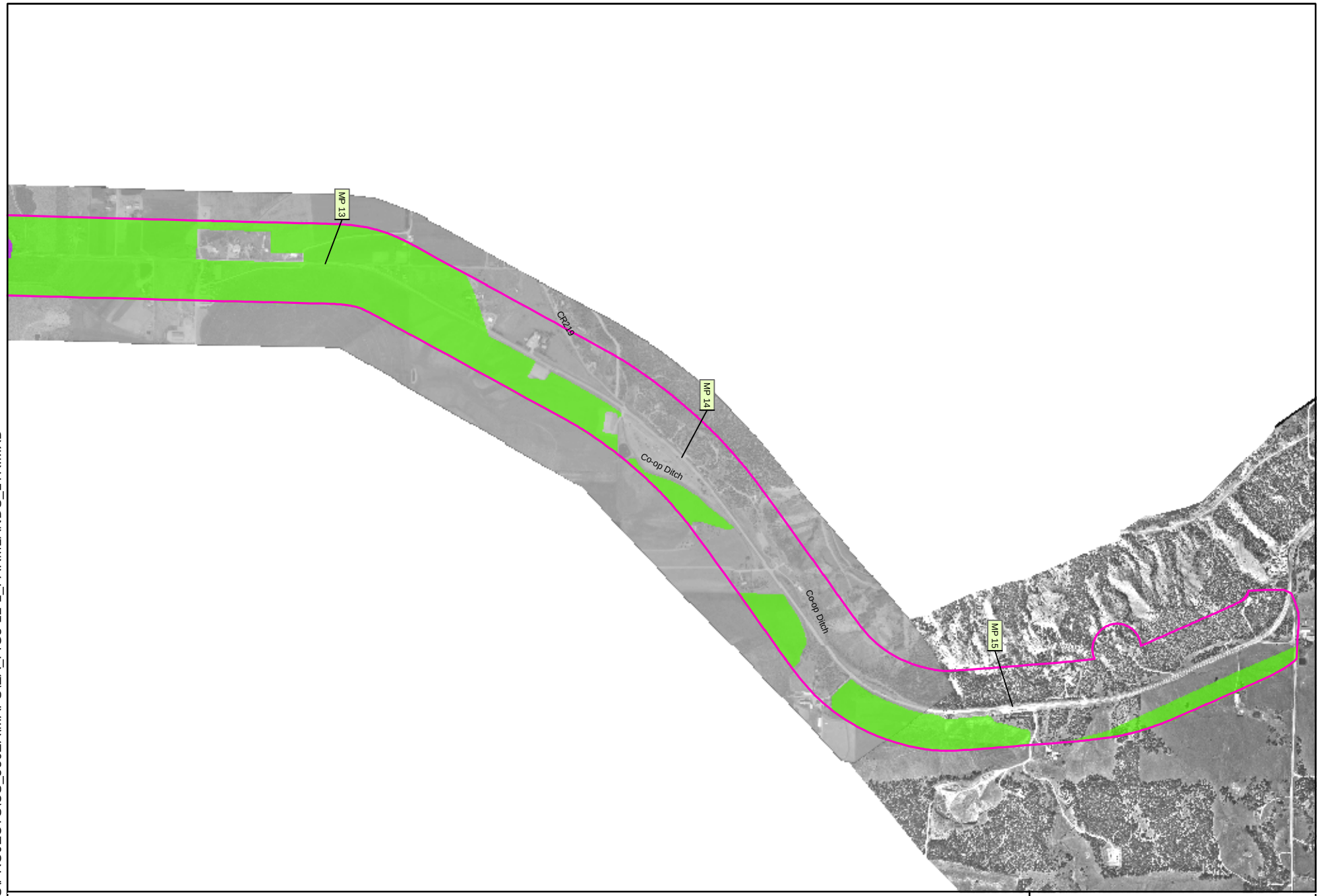
1,000 500 0 1,000 2,000 Feet

US 550 EA

Prime and Irrigated Farmland from MP 9.3 to MP 12.3
Figure 3.12-4

02/04/05

To and From MP Distances Are Approximate



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Legend

Farmland Study Area

Farmlands

Irrigated

Prime

1,000 500 0 1,000 2,000 Feet

US 550 EA

Prime and Irrigated Farmland from MP 12.3 to MP 15.4 Figure 3.12-5

02/04/05

To and From MP Distances Are Approximate

this alignment would have a negligible effect on overall resources of irrigated land when compared to the 339,831 acres in the region.

Impacts Specific to Alternative 3

Under Alternative 3, an additional 27.0 acres (10.9 percent of total acreage in study area) of Prime Farmland would be impacted by construction of this alignment. Approximately 4.3 additional acres (0.6 percent of total acreage in study area) of Statewide Important Farmland would be impacted by construction of this alignment. The total of 41.8 acres of Prime Farmland and 68.5 acres of Statewide Important Farmland potentially impacted by this alignment would have a negligible effect on overall resources of irrigated land when compared to the 339,831 acres in the region.

3.12.3 Mitigation Measures (Preferred Alternative)

Issue F-1: Approximately 29.3 total acres of Prime Farmland would be impacted by the Preferred Alternative.

Mitigation Measure F-1: To limit impacts to Prime Farmland, the amount of land acquired for highway improvements will be limited to only the portions of parcels actually needed for the ROW instead of the entire parcel.

Effectiveness: Mitigation Measure F-1 would reduce permanent impacts to Prime Farmlands to approximately 26 acres total.

Issue F-2: Two agricultural properties irrigated with a center-pivot irrigation system would be impacted by all the action alternatives, including the Preferred Alternative.

Mitigation Measure F-2: CDOT will coordinate with affected landowners and relocate irrigation systems to the extent practical to promote ongoing agricultural uses of Prime Farmland and Statewide Important Farmland within the project area. If the current system cannot be modified, the irrigation system may be replaced with another type of system.

Effectiveness: As a result, there would be no impact to irrigation systems in the project area.

3.12.4 Residual Adverse Impacts

If the mitigation measures are implemented, impacts to Prime Farmland and Statewide Important Farmland would be limited to 26 and 44 acres, respectively.

3.13 SOCIOECONOMICS

A socioeconomic analysis was conducted to evaluate social and economic impacts as a result of the proposed project. For the purposes of the socioeconomic analysis, the region of influence includes La Plata County and the following special districts: Durango School District, Southwest Water Conservation, Florida Water Conservancy, Animas Fire Prevention, and Florida Mosquito Control. The entire project corridor is located within Census Tract 9402. Public facilities within the highway corridor include Sunnyside

Elementary School, Animas Fire Protection Station 4l (located at Old Homestead Mobile Home Park), and Animas Fire Protection Station 11 (near the intersection of US 550 and CR 318).

3.13.1 Affected Environment

Social Resources

The US 550 corridor has largely rural characteristics with commuters between Durango, Colorado, and Aztec, New Mexico, primarily using the corridor. The corridor consists mainly of agricultural, rural residential, and SUIT land.

Population

The 2000 US Census recorded a population of 43,941 in La Plata County. Since 1990, the average annual growth rate has been 3.7 percent, and CDS projects that La Plata County's population would increase to 68,385 by 2020 and to 74,726 by 2025 (CDS 2003).

Housing

According to the 2000 US Census, there were 20,765 housing units in La Plata County: 13,021 (62.7 percent) conventional single-family units, 3,444 (16.6 percent) mobile homes, and 4,128 (19.9 percent) housing units located in multifamily structures. The average household size in Census Tract 9402 is 2.62 persons.

Year-round housing units in La Plata County are expected to total nearly 27,800 by 2020, reflecting projected population growth. However, the number of new seasonal housing units is anticipated to increase, reflecting a national trend of retirees purchasing second homes in areas with scenic and recreational amenities. For example, a proposed major expansion of housing at Durango Mountain Resort (Purgatory Ski Area) is targeted toward attracting new seasonal residents.

There are several large-lot, typically three acres or larger, subdivisions in the vicinity of the US 550 highway corridor, but none of them are bisected by the highway. Most of these subdivisions are concentrated near Sunnyside Elementary School. CR 215 provides access to five subdivisions west of the highway. Sunnyside Apartments and Old Homestead Mobile Home Park are also located near the school.

Businesses

Thirty-two businesses were identified along the US 550 highway corridor and adjacent roads, including a mobile home and RV park, (although the individual units are considered residences); two fire stations; an elementary school; and various agricultural operations. Businesses were identified through field investigations, and by examining La Plata County Assessor records.

A mix of commercial and residential uses has occurred along La Posta Road (CR 213) west of the study area during recent years, particularly in the vicinity of Animas Air Park. La Plata County completed construction of a new bridge across the Animas River during 2004, which replaced the existing access from the north via CR 213. La Plata County has

limited new residential and commercial development along CR 213 because of the road's characteristics. In response to construction of the new bridge, which would make higher density development more feasible, the City of Durango is planning to develop an area plan for the La Posta Road area.

Economic Resources

Estimated per capita income in La Plata County in 2000 was $26,517 compared to $32,434 for the State of Colorado (CDS 2003). According to the 2000 US Census, 11.7 percent of La Plata County's population was below the poverty level, compared to 9.3 percent for the State of Colorado. Estimated employment in La Plata County in 2000 was 30,697 with an unemployment rate of 3.76 percent (CU 2003). The number of individuals employed by economic sector in La Plata County in 2000 is shown in Table 3.13-1.

Table 3.13-1
La Plata County Labor by Economic Sector

Economic Sector	Number of Employees
Agricultural products and services	1,544
Mining	320
Construction	3,226
Manufacturing	1,016
Transportation, communications, and utilities	954
Wholesale and retail	6,971
Finance, insurance, and real estate	1,917
Services	10,632
Government	3,907
Total	**30,487**

Source: CU 2003

Total revenue received by La Plata County in 2000 was $36,206,324, which included $9,948,011 in property tax revenue and $9,403,815 in sales and use tax revenue. Total taxable assessed value was $1,163,142,000 (CDS 2003).

Tourism, as the number one industry in La Plata County, is likely to continue as the dominant economic force during the next 20 years, with retail and service sectors providing the majority of the employment (Grandview Area Plan, 2004). With projected community expansion and increased tourism, highways with adequate capacity are needed to support sustained economic growth.

3.13.2 Environmental Consequences

Impacts Specific to No Action

Social Resources

In the short term, the No Action Alternative is anticipated to have no effect on existing residents and businesses. However, in the long term, increasing traffic congestion would increase the potential for accidents on US 550 and would indirectly impact some businesses and residents because of increased commuter times and congestion.

Regionally, the No Action Alternative would have no major effect on the projected development and socioeconomic changes in La Plata County. However, as traffic increases, congestion can have an adverse impact on potential developments and on the tourist-based economy. (Maynard, 2004)

Economic Resources

Under the No Action Alternative, there is no loss of assessed value or property taxes. However, market forces and expansion of suburban development, particularly replacement of some agricultural land by subdivisions, can result in land use changes and subsequent economic changes along the US 550 corridor. Without improvements to US 550, traffic congestion could reduce La Plata County's attractiveness as a tourist destination.

Impacts Common to all Action Alternatives

All of the alternatives (except the No Action) listed in this EA would have the following impacts as a baseline.

Social Resources

Proposed improvements to the highway and new or improved intersections would directly impact businesses and individuals that own, reside on, or conduct business on properties that are partially within the new highway ROW. For many properties, only a small area would be acquired (partial impact), which may not require relocation of housing units or businesses. For other properties, however, structures located within the conceptual ROW are proposed acquisitions (full impact). Table 3.13-2 summarizes full impacts to properties including those properties where structures are proposed for relocation, common to all action alternatives.

Table 3.13-2
Minimum Impacts to Residences, Residents, and Businesses
Common to All Action Alternatives

Highway Segment	Full Impacts to Residences[1]	Number of Residents Proposed to be Relocated[2]	Full Impacts to Businesses
MP 0 to MP 3.1	0	0	1
MP 6.6 to MP 10.3	5	13	1
MP 10.3 to MP 15.4	3	8	0

Highway Segment	Full Impacts to Residences[1]	Number of Residents Proposed to be Relocated[2]	Full Impacts to Businesses
Total Common to All Action Alternatives	**8**	**21**	**2**

[1] Residences include single-family and multi-family homes, RV spaces, and mobile homes.

[2] Based on 2000 US Census, assume 2.62 persons per household for Census Tract 9402.

While impacts would be disruptive to individual residents and business owners that would be relocated, there is available land within La Plata County to accommodate the required relocations.

Impacts on Community Cohesion

A sense of community exists in some parts of the study area, based on interviews with approximately 20 residents and business owners. Some families have ranched or farmed in the area for several generations. One family owns Sunnyside Apartments and Old Homestead Mobile Home Park; the original family homestead is located directly across the highway.

The response to the following question was varied: "What effect will a limited access highway have on community cohesion between the east and west sides of the highway?" Some interviewees had no opinion or said that the new highway would have no impact on interactions between neighbors (e.g., if people want to visit with each other, they would continue to drive to do so). Others thought that the impact of additional driving distances would be minor and would not stop visits. Other interviewees stated that the highway would act as a barrier and might affect the ability and safety of children visiting each other.

Construction of the highway improvements without mitigation would affect safe pedestrian crossings to the school from residences on the west side, which includes a large concentration of children at Old Homestead Mobile Home Park. Additionally, the owner of the mobile home park would not be able to easily walk across the highway to visit family members. To alleviate these concerns, a pedestrian bridge or underpass would be built as part of the design for any of the action alternatives to provide safe access between Sunnyside Elementary School and the Old Homestead Mobil Home Park (See Section 2.3.2.1, *Design Features Common to All Action Alternatives*). Additionally, the 9-R School District currently provides busses for children who live in the mobile home park to prevent pedestrian highway crossings. This practice would continue with highway improvements.

Impacts on Residential Travel Patterns and Accessibility

For safety and other design considerations, access to and from many parcels would be limited to right-in and right-out turns, interspersed with full-movement intersections where right turns, left turns, and U-turns would be allowed. Existing direct access to and from some parcels would be eliminated, replaced by shared access via new frontage roads or via the present road alignment converted to short access road segments. In some locations, the intersections along US 550 would be relocated. Altered highway access

points, some full movement intersections, and some just right-in/right-out, would increase current driving distances for some residents. There are no substantial differences between the alternative alignments relative to additional driving miles and number of affected properties and residences resulting from altered highway access.

Impacts on Businesses, Policy and Fire Protection, and School Districts

Fire Protection and Emergency Response

There are three volunteer fire stations that provide services to the US 550 project corridor. The stations do not have full-time fire fighters and rely on volunteers. Station 4 is one station that would respond and is located along the corridor, adjacent to US 550 at 8565 US 550 South. The station has between 6-10 volunteer fire fighters. Station 7, located at 204 Highway 172, also may respond to calls within the corridor and has approximately 10 volunteers. Station 11, located at 4040 US 550 South, may also respond and has approximately 4-5 volunteer firefighters.

Fire Station 4 because of its proximity to US 550 may be impacted, and may require additional emergency turn lanes and access areas. Travel patterns and accessibility to and from the station and accidents may occur during construction.

Law Enforcement

CSP has 11 staff assigned to the US 550 area. Coverage is provided between 6 am to 11 or midnight during the week and until 2:00 or 3:00 am on the weekend. The proposed improvements to US 550 are not anticipated to require additional law enforcement personnel.

Of the 32 businesses along the project corridor, three are located within the conceptual ROW and are proposed relocations. Existing highway access would not change for eight businesses; the roadway improvements would impact them positively because the highway would be safer. However, highway improvements would alter existing access from the highway for 18 businesses, resulting in longer driving distances.

How these access impacts affect the 18 businesses was determined by conducting a business function and location analysis and by interviewing the business owners or managers. Prior to interviewing business owners, a questionnaire was developed and a field survey was conducted to determine the degree to which a business may be dependent on good visibility/easy access from the highway.

During interviews, the business owner or manager was asked whether or not altered highway access or additional driving distance would have an adverse impact on the business. Eight of the owners or managers interviewed stated that proposed highway improvements would have a positive impact or no impact on the operation of the businesses. The owners or managers of the other 10 businesses had concerns about the following:

- Increase in emergency response time, including ability of emergency response vehicles to get to accidents, need for emergency turning locations in the median, and potential increases in fire insurance rates due to increase in emergency response time;

- Safety of children in mobile home parks due to large trucks turning around inside the park;
- Loss of income from relocated mobile homes;
- Additional miles of travel to the business; and
- Need for flagging vehicles to escort slow-moving equipment on divided highway.

Economic Resources

On a regional scale, proposed improvements to US 550 would contribute to local economic development by making the highway safer for residents and tourists. Tourists who travel through the southern part of the county are an important component of the local economy. Although some businesses may be adversely affected by additional driving distances resulting from a limited access highway, a safer and more efficient highway would be an overall benefit to commerce.

Due to the availability of vacant parcels in La Plata County, the structures impacted by the highway improvements would likely be replaced within La Plata County, thus having no measurable impact on the county's assessed valuation or amount of property taxes collected. Similarly, affected businesses would likely be relocated within the county, thereby having no measurable effect on employment or sales tax revenues. However, individual business owners may incur losses not associated with property tax revenue.

Impacts Specific to Alternative 1

The actual impacts from each alternative vary only in the number of impacted residences and businesses. As demonstrated in Table 3.13-3, Alternative 1 would fully impact 12 residences and three businesses.

Table 3.13-3
Relocation Impacts – Alternatives 1

Highway Segment	Relocated Residences	Number of Residents Proposed to be Relocated	Relocated Businesses
MP 3.1 to MP 6.6	4	10	1
Impacts Common to All Action Alternatives	8	21	2
Total Alternative 1	**12**	**31**	**3**

Impacts Specific to Alternative 2 (Preferred Alternative)

Alternative 2 would have the same impacts as those described under Alternative 1.

Impacts Specific to Alternative 3

This alternative would have slightly less of an impact as shown in Table 3.13-4. Ten residences would be impacted with 26 residents relocated.

Table 3.13-4
Relocation Impacts – Alternative 3

Highway Segment	Relocated Residences	Number of Residents Proposed to be Relocated	Relocated Businesses
MP 3.1 to MP 6.6	2	5	1
Impacts Common to All Action Alternatives	8	21	2
Total Alternative 3	**10**	**26**	**3**

3.13.3 Mitigation Measures (Preferred Alternative)

None - See Section 2.4, *Construction Features Common to All Action Alternatives.*

3.13.4 Residual Adverse Impacts

No measurable loss of real property or property tax revenue for the county is anticipated. Relocations would be required for 31 individuals, including 12 residences and 3 businesses. While CDOT would try to minimize the adverse impacts of relocation, there is available land with La Plata County to accommodate the required relocations. Displaced persons, businesses, farms, and nonprofit organizations would be compensated and provided relocation assistance following the procedures outlined in *Chapter 2, Section 2.4.1 Property Acquisition and Relocation.* This section describes CDOT and FHWA policy on property acquisition and relocation, as well as the procedures required by The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), as amended by the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17) (Uniform Act).

3.14 ENVIRONMENTAL JUSTICE

Environmental Justice (EJ) is a term used in this EA to describe the process that was followed to identify whether minority or low-income populations may be disproportionately high and adversely affected by the proposed improvements to US 550.

3.14.1 Regulations Protecting Minority and Low Income Populations

On February 11, 1994, President Clinton signed Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice to Minority and Low Income Populations." The EO focuses federal attention on the environmental and human health conditions of minority and low-income populations, promotes nondiscrimination in federal programs affecting human health and the environment, and provides minority and low-income populations access and opportunity to participate in matters relating to the environment. The U.S. Department of Transportation (US DOT) issued an order in 1997 (US DOT Order 5610.02), followed by the Federal Highway Administration in 1998 (FHWA Order 6640.23). Both of these orders relate directly to addressing EJ activities and responsibilities for transportation projects. Minority and Low-income populations are defined as follows:

- **Minority** refers to persons who are Black (having origins in any of the black racial group of Africa or African American); Hispanic (of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race); Asian (having origins in any of the original peoples of the Far East), Southeast Asia, the Indian subcontinent, or the Pacific Islands); or Native American Indian and Alaskan (having origins in any of the original people of North America maintaining cultural identification through tribal affiliation or community recognition).
- **Low-income** refers to household income at or below the Department of Health and Human Services (HHS) poverty guidelines. In Colorado the Community Development Block Grant (CDBG) thresholds are typically used to identify low-income populations because it is generally more inclusive than HHS values. As of 2005, the HHS guideline for a family of four is currently $19,950. The CDBG threshold used for this project is 50 percent of the area median income (AMI), which ranges from $23,000 to more than $31,000 at the county level.

The three fundamental principles of Environmental Justice are 1) To 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; 2) To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process; and 3) To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority populations and low-income populations.

3.14.2 Public Involvement Outreach

CDOT held two community meetings in the study area. The first public meeting on September 16, 2003, was held at Sunnyside Elementary School across from the Old Homestead Mobile Home Park, the location of the largest population center along the corridor. The second meeting was held on September 17, 2003, in Ignacio on the Southern Ute Indian Reservation. In addition, CDOT met individually with several residents and businesses. All meeting announcements were provided in English and Spanish. The announcements were also provided to Southern Ute Tribal members and staff, and to KSUT (the Tribal-sponsored public radio station), to the *Southern Ute Drum* (the Tribal-sponsored paper), and to the *Durango Herald*. See Section 4.0, *Public Involvement*, for more detail on concerns and issues expressed at these public meetings.

3.14.3 Affected Environment

Minority Populations

The FHWA guidance on environmental justice defines a minority population as any readily identifiable group of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed or transient persons (such as migrant workers) who would be similarly affected by a proposed program, policy, or action. Table 3.14-1 below presents the racial makeup of La Plata County.

Table 3.14-1
Racial Makeup of La Plata County, 2000

Race	Percent of Population in La Plata County
Caucasian	87.3
Persons of Hispanic origin (of any race)	10.4
American Indian and Alaskan Native	5.8
Asian	0.4
African American	0.3
Native Hawaiian and Other Pacific Islander	0.1
Some other race	3.9
Two or more races	2.3

Source: 2000 US Census Bureau.

Notes: The numbers may not up to 100 percent because, according to the US Census Bureau, Hispanic origin is not a race, and persons of Hispanic origin may be of any race.

The existing US 550 ROW crosses part of the Southern Ute Indian Reservation. Most of the affected Tribal land is located in the southern part of the study area. Virtually all of this land is undeveloped except for scattered gas wells, an access to the Animas River for fishing, and four residences near the top of Bondad Hill.

Methods for Identifying Minority Populations

Year 2000 US Census data were used to obtain minority population information. Demographic data from the 2000 US Census were supplemented by interviews to describe the ethnicity, income, and other characteristics of the population likely to be directly affected by proposed US 550 improvements. Supplemental information also was obtained from public agencies and tax assessor records to identify minority populations. Additionally, the project team performed a windshield and written survey of businesses along the corridor to attempt to determine the presence or absence of minority communities along the corridor.

Supplemental information was gathered because the US Census blocks in the study area are so large that corridor-specific information on minority and low income populations was difficult to ascertain from the US Census data alone. Additionally, the corridor is split east and west by two different US Census blocks, making inferences about minority and low income populations within the corridor even more difficult to make from the US Census data. Figure 3.14-1 represents the geographical location of census blocks within the project area. The study concluded that minority populations do exist in the corridor.

Low-Income Populations

The FHWA guidance on environmental justice defines a low-income population as any readily identifiable group of low-income persons who live in geographic proximity, and if circumstances warrant, geographically dispersed or transient persons (such as migrant workers) who would be similarly affected by a proposed FHWA program, policy, or activity (FHWA 1998).

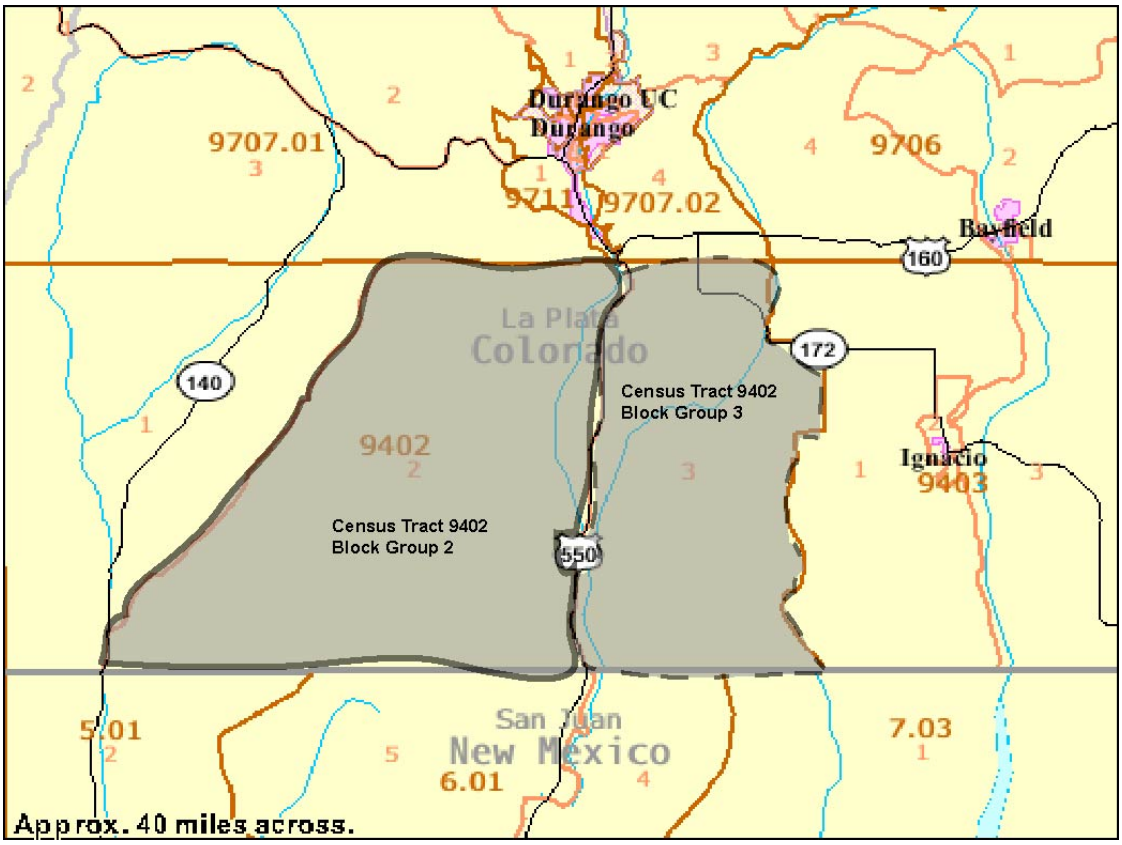


Figure 3.14-1 Location of Census Blocks in the Project Area

Methods for Identifying Low-Income Populations

To identify low-income populations, the project team used the CDBG Program definition of low-income. CDBG numbers were utilized because housing costs typically account for the greatest portion of a household's income; therefore, households receiving or qualifying for CDBG funds are good indicators for identifying low-income populations. The Department of Housing and Urban Development Community Development Program Office was contacted to obtain CDBG data. The 2000 low-income thresholds for a family of four for La Plata County is $22,672.

The US Census Bureau maintains a database of economic data by census block groups. Poverty and income data from the 1990 and 2000 Census are compared to data for La Plata County and the State of Colorado in Table 3.14-2 (US Census Bureau 1990 and 2000).

Table 3.14-2
Persons in Poverty and Median Income in 1990 and 2000

Location	Persons Below Poverty (People of all ages) (1990)[1] (%)	Persons Below Poverty (People of all ages) (2000)[2] (%)	Median Household Income ($) (1990)[1]	Median Household Income ($) (2000)[2]
La Plata County	11.8	8.5	27,600	45,345
Block Group 2 (west of US 550)	13.0	6.8	29,000	47,916
Block Group 3 (East of US 550)	8.4	9.3	30,750	47,976
State of Colorado	11.9	9.3	30,140	47,203

[1] Data from the 1990 Census
[2] Data from the 2000 Census

Notes: The Department of Housing and Urban Development/CDBG office does not keep records prior to 1992; therefore, 1990 CDBG low-income thresholds for each county are not available.

Supplemental information on income levels within the corridor was obtained from public agencies and nonprofit organizations, including La Plata County Planning Department, La Plata County Department of Social Services, Meals on Wheels, Habitat for Humanity of La Plata County, Housing Solutions, and Community Connections and mobile home park owners. The clients of the La Plata County Department of Social Services include individuals on food stamps, the elderly, day care centers, and low-income people in transition from welfare to work.

Interviews were conducted with owners of mobile home parks in the Durango – Bayfield area. Although some of these businesses are not located within the study corridor, the interviews were conducted to determine vacancies, rental rates, other economic data, and the ability of these facilities to absorb residents who may be displaced by highway improvements.

The study concluded that low-income populations exist in the corridor.

3.14.4 Environmental Consequences

Impacts Specific to No Action

Without the project, low-income households and minority households would continue to experience the noise, air pollution, and access that they currently experience, but increase proportional to higher levels of congestion as the traffic increases. No ROW impacts would occur due to this project.

Impacts Common to all Action Alternatives

Socioeconomic and Land Use

None of the businesses directly impacted appears to be owned by a member of a minority group, and there are no anticipated adverse impacts to minority-owned businesses from the action alternatives (see Section 3.10, *Land Use*). All action alternatives would require acquisition of 6 acres of vacant Tribal land that is not currently planned for development.

Residential Access

A number of residents on the corridor would experience additional driving distances to and from their residences due to altered highway access under all action alternatives. Based on interviews with the local business owners, and an analysis of La Plata County Assessor records identifying minority surnames, approximately 30 of the homes that would experience additional driving distances are occupied by minority households, amounting to approximately 16 percent of the total number of households that would experience additional driving distances. This percentage is proportional to the countywide percentage of minority households. Four of these homes are located on the Southern Ute Indian Reservation near the top of Bondad Hill.

School Access and Community Cohesion

While general motor-vehicle access to the Sunnyside Elementary School would become safer with turning lanes and acceleration/deceleration lanes, construction of the highway improvements without mitigation would affect safe pedestrian crossings to the school from residences on the west side, which includes a large concentration of children at Sunnyside Apartments and Old Homestead Mobile Home Park. One family owns Sunnyside Apartments and Old Homestead Mobile Home Park; the original family homestead is located directly across the highway. While it is likely that some children who live in the apartments and mobile home park walk across the highway to Sunnyside Elementary School and its playground, such trips are dangerous and would be more so when crossing an improved four-lane highway.

During interviews the following question was asked to local residents: "What effect will a limited access highway have on community cohesion between the east and west sides of the highway?" Some interviewees had no opinion or said that the new highway would have no impact on interactions between neighbors (e.g., if people want to visit with each other, they would continue to drive to do so). Others thought that the impact of additional driving distances would be minor and would not stop visits. Other interviewees stated that the highway would act as a barrier and might affect the ability and safety of children visiting each other.

To address the issue of safe pedestrian access, a pedestrian bridge or underpass would be built as part of the design for any of the action alternatives to provide safe access between Sunnyside Elementary School, Sunnyside Apartments, and the Old Homestead Mobil Home Park (See Section 2.3.2.1, *Design Features Common to All Action Alternatives*). Additionally, the 9-R School District currently provides busses for children who live in the mobile home park to prevent pedestrian highway crossings. This practice would continue with highway improvements.

Residential Relocations

There are numerous single family residences scattered along the corridor and one mobile home park. According to La Plata County Assessor's records the land values associated with single family residences along the corridor range from $93,000 to over $1 million. Eight residences would require relocation under all action alternatives. One of the eight homes to be relocated is considered a low-income residence based on the CDBG low-income threshold. Based on La Plata County Assessor records, three of the eight homes

that are proposed to be relocated under all action alternatives are owned by a family of minority descent.

Noise

Without mitigation, six isolated homes and 13 homes within the mobile home park would experience noise from the proposed US 550 improvements that exceeds the noise abatement criteria (NAC) established by CDOT and FHWA in accordance with 23 CFR 772 (see Section 3.15, *Noise*). None of the six isolated homes appears to be owned by a member of a minority group. A noise wall would be constructed as part of the design for any of the action alternatives that would reduce the noise level for the 13 homes within the mobile home park to a level that is lower than the existing conditions (See Section 3.15, *Noise*, Table 3.15-9, *Wall Analysis Summary*). The noise wall also would benefit 48 additional homes in the vicinity of the mobile home park by reducing noise levels beyond existing conditions even though these additional homes are not expected to experience noise levels exceeding NAC as the result of any of the action alternatives.

Impacts Specific to Alternative 1

Under Alternative 1, an additional 3 acres of vacant Tribal land would be required bringing the total impact to 9 acres of Tribal land. Socioeconomic resources, land use, residential and school access, community cohesion, and noise would be the same as those impacts common to all alternatives. A total of 12 houses would be relocated under Alternative 1, including three (25 percent) that are known to be owned by a member of a minority group, and two (17 percent) considered low-income residences based on the CDBG low-income threshold. These percentages are roughly proportional to the county and corridor-wide percentages of minority and low-income households.

Considering the noise wall included in the project, as well as the pedestrian crossing between the mobile home park and the school, there is no apparent disproportionately high and adverse impact to minority and low-income populations under this alternative.

Impacts Specific to Alternative 2 (Preferred Alternative)

Under Alternative 2, an additional 4 acres of vacant Tribal land would be required bringing the total impact to 10 acres of Tribal land. Socioeconomic resources, land use, residential and school access, community cohesion, and noise would be the same as those impacts common to all alternatives.

Impacts to minority and low-income residents are the same as described for Alternative 1. Considering the noise wall included in the project as well as the pedestrian crossing between the mobile home park and the school there is no apparent disproportionately high and adverse impact to minority and low-income populations under this alternative

Impacts Specific to Alternative 3

Under Alternative 3, an additional 18 acres of vacant Tribal land would be required bringing the total impact to 24 acres of Tribal land. Socioeconomic resources, land use, residential and school access, community cohesion, and noise would be the same as those impacts common to all alternatives.

A total of ten houses would be relocated under Alternative 3, with 3 (33 percent) known to be owned by a member of a minority group, and one (10 percent) considered a low-

income residence based on the CDBG low-income threshold. These percentages are roughly proportional to the county and corridor-wide percentages of minority and low-income households.

Considering the noise wall included in the project as well as the pedestrian crossing between the mobile home park and the school there is no apparent disproportionately high and adverse impact to minority and low-income populations under this alternative.

3.14.5 Mitigation Measures (Preferred Alternative)

Due to the pedestrian bridge or underpass that will be provided between Old Homestead Mobile Home Park and Sunnyside Elementary School, and the noise wall that will be constructed as part of the design for any action alternative (see Section 2.3.2.1 *Design Features Common to All Action Alternatives)*, no additional mitigation is required.

3.14.6 Residual Adverse Effects

Three homes owned by members of a minority group and two homes considered low-income based on the CDBG low-income threshold would be relocated. Ten acres of Tribal land would be impacted.

3.15 NOISE

3.15.1 Terminology and Methodology

Traffic Noise Analysis Procedures

The effect of traffic noise on properties adjacent to US 550 was analyzed for the entire corridor. The noise analysis was performed in-accordance with the standards outlined in Title 23, CFR Article 772 (23 CFR 772), USDOT, FHWA, and CDOT Noise Analysis and Abatement Guidelines (December 1, 2002) in addressing noise generated impacts.

Highway noise levels are quantified using the equivalent noise level (L_{eq}) in A-weighted decibels (dBA). The equivalent noise level is essentially the average noise level over a given time period, which for highway studies is one hour. A-weighting is applied to measured or predicted noise levels to mimic the fact that the human ear is more sensitive to high frequencies than to low frequencies.

Noise Abatement Guidelines

Operational Noise

Traffic noise levels are measured on a logarithmic scale in units of A-weighted decibels (dBA), which closely approximate human frequency response. On this scale, a doubling of traffic volume and its associated sound energy increase raises nearby noise levels by approximately 3 decibels. A tenfold sound energy increase raises nearby noise levels by approximately 10 decibels. However, humans do not perceive noise variation in direct proportion to the change in sound energy. The average person cannot normally perceive

traffic noise changes of less than 3 decibels, and a 10 decibel traffic noise increase sounds to the average person as if the noise becomes twice as loud.

The proposed project is subject to CDOT noise guidelines, which have been approved by and are consistent with the FHWA noise regulation as specified in 23 CFR 772. The primary consideration of the guidelines is protection of areas where there is frequent outdoor use. The CDOT guidelines establish noise abatement criteria, as well as design and cost requirements for noise mitigation. CDOT guidelines state that noise mitigation should be considered for any receptor or group of receptors where predicted traffic noise levels meets or exceeds the noise abatement criteria (NAC) shown in Table 3.15-1. Traffic noise is considered to meet or exceed NAC when predicted noise levels reach or exceed the criteria listed below in Table 3.15-1.

Table 3.15-1
CDOT Noise Abatement Criteria - A-Weighted Sound Level-decibels (dBA)

Activity Category	Leq(h)	Description of Activity Category
A	56 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	66 (exterior)	Picnic area, recreational areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	71 (exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	None	Undeveloped lands.
E	51 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Either L10(h) or Leq (h), but not both, may be used on a project. For this project, Leq(h) was used.

The NAC that apply are activity Category B (residences, schools, churches, parks), Activity Category C (for the purposes of this study, mostly commercial areas), and Activity Category D (undeveloped lands). Noise abatement guidelines state that abatement strategies must be considered when the L(eq) noise levels reach 66 dBA for an NAC B property, or 71 dBA for an NAC C property.

These guidelines also state that noise abatement should be considered when the noise levels "substantially exceed the existing noise levels." This criterion is defined as increases in the L(eq) of 10.0 dBA or more above existing noise levels.

Construction Noise

The impact of construction noise is not serious in most instances. Procedures used for evaluating highway construction noise were those prescribed by FHWA Technical Advisory: T 6160.2, "Analysis of Highway Construction Noise."

Modeling Approach

In order to model the roadway, the project was divided into individual sections and then into smaller segments based on the limitations of the noise modeling software. The roadway was broken into four sections, beginning at New Mexico State Line (Station 100+00) and ending approximately 0.5 mile south of the junction of CR 220 and US 550 (Station 913+06). The characteristics of the environment provided for natural locations of section breaks along US 550 (Table 3.15-2).

Table 3.15-2
Section Breaks Along US 550

Section	Alternative Description	Alternative Name	Stationing by Section
1	MP 0 to MP 3.1	"State Line North"	Sta. 100+00 to 250+00
2	MP 3.1 to MP 6.6	"Bondad Hill"	Sta. 250+00 to 450+00
3	MP 6.6 to MP 10.5	"Sunnyside"	Sta. 450+00 to 640+00
4	MP 10.5 to MP 15.4	"Florida Mesa"	Sta. 640+00 to 913+06

CRs, 220, 302, 214, 215, 213, and 318 were included in the modeling process to determine their noise impact.

Traffic Noise Modeling Procedures

For each section of the corridor, noise levels were modeled using the CDOT's Noise Prediction Software, "The Technology Group Highway Noise Analysis Software Library." The CDOT software is based on FHWA's noise prediction model STAMINA 2.0/OPTIMA, and employs the 1994 Colorado emission factors.

Noise Model Validation

Noise measurements were taken at two locations in each section for a total of eight measurements along US 550 in December 2003. Short-term noise level measurements were taken every minute for a 15-minute duration at the locations. Other data collected concurrently in the field included; receptor locations, traffic volumes, vehicle types, topography type, receptor location and vehicle operating speeds. Locations of any existing walls or other noise attenuation features were also noted for use in coding and validating the noise models.

The validation model was coded using the field data as input. The modeled receptor locations were placed primarily in residential areas where residents may be exposed to high noise levels, such as backyards, front porches, and patios, and were set at a height of 5 feet above ground. The results of the validation model were compared to the noise levels measured in the field. The average difference between the field-measured noise levels and the validated model results was +/-2.0 dBA, and considered acceptable (+/-3.0 bBA). The validated noise model was then used as the basis for developing the existing and alternative noise models. A listing of these sites, plus a more detailed discussion of the noise analysis, can be found in Appendix E.

3.15.2 Environmental Consequences

Existing Conditions

The existing conditions model analysis was completed using traffic volumes that represent LOS "C" traffic operating conditions at the posted speed limit.

The Alternatives 1, 2, and 3 noise models, between the NM State Line and the CR 220 and US 550 intersection, reflect LOS C operations for future traffic volumes with the proposed four-lane highway improvements operating at the proposed posted speed limits.

The alternatives model results were compared to the existing conditions model data to determine where noise abatement should be considered. Table 3.15-3 shows the noise level comparisons for receivers that exceeded NAC limits, and receivers that met or exceeded the NAC. Some receivers (homes) would be relocated depending on the selected alternative and are indicated by an asterisk (*) and were not considered for noise mitigation.

Table 3.15-3
2025 Alternatives Noise Level Comparisons

Receptor	Land-Use Category	CDOT NAC (dBA)	Represents	Existing Conditions Leq	2025 Alternative Leq	Meets or Exceeds NAC Limits?	10 dBA increase over Existing	Alternatives
P4	B	66	1 house	62.2	**72.4***	N/A	N/A	**1, 2, 3**
R27	B	66	1 house	**69.4**	**66.8**	**Yes**	No	**1, 2, 3**
R32	B	66	1 house, 1 outbuilding	**67.7**	**82.0***	N/A	N/A	**1, 2, 3**
R33	B	66	1 house, 3 outbuilding	58.9	**66.1**	**Yes**	No	**1, 2, 3**
R34	B	66	1 house	59.8	**67.6**	**Yes**	No	**1, 2, 3**
R47	B	66	1 house, 4 outbuildings	**66.2**	**76.0***	N/A	N/A	**1, 2, 3**
R58	B	66	1 house, 2 outbuildings	65.0	**75.4***	N/A	N/A	**1, 2, 3**
R79	B	66	1 house	63.8	**69.1***	N/A	N/A	**1, 2, 3**
R80	B	66	1 house	63.7	**68.6***	N/A	N/A	**1, 2, 3**
P91	B	66	13 mobile homes, mobile home park	**66.8**	**67.7**	**Yes**	No	**1, 2, 3**
R91	B	66	1 house	63.2	**77.1***	N/A	N/A	**1, 2, 3**
R92	B	66	1 house	**67.8**	**77.9***	N/A	N/A	**1, 2, 3**
R93	B	66	1 house, 1 outbuilding	**70.0**	**73.6***	N/A	N/A	**1, 2, 3**
R94	B	66	1 house, 3 outbuildings	62.8	**77.0***	N/A	N/A	**1, 2, 3**
R95	B	66	1 house	62.4	**76.0***	N/A	N/A	**1, 2, 3**
R100	B	66	1 house	56.7	59.0*	N/A	N/A	**1, 2, 3**
R110	B	66	1 house, 1	59.2	65.5*	N/A	N/A	**1, 2, 3**

Receptor	Land-Use Category	CDOT NAC (dBA)	Represents	Existing Conditions Leq	2025 Alternative Leq	Meets or Exceeds NAC Limits?	10 dBA increase over Existing	Alternatives
			outbuilding					
R111	B	66	3 houses, 3 outbuildings	59.8	**66.5**	**Yes**	No	**1, 2, 3**
R116	B	66	1 house (boarded up)	61.0	**67.4***	N/A	N/A	**1, 2, 3**
R117b	B	66	1 house	62.5	**68.9***	**N/A**	**N/A**	**1, 2**
R117d	B	66	1 house	62.5	**72.7***	**N/A**	**N/A**	**3**
R119b	B	66	1 house	61.8	**67.6**	**Yes**	No	**1, 2**
R119d	B	66	1 house	61.8	**68.9**	**Yes**	No	**3**
R124b	B	66	2 houses	60.6	**66.1**	**Yes**	No	**1, 2**
R125d	B	66	1 house	63.1	**69.6**	**Yes**	No	**3**
R127b	B	66	1 house	64.8	**73.2***	**N/A**	**N/A**	**1, 2**
R127d	B	66	1 house	64.8	**67.0***	**N/A**	**N/A**	**3**
R131b	B	66	1 house	60.8	62.9*	N/A	N/A	**1, 2**
R131d	B	66	1 house	60.8	61.7*	N/A	N/A	**3**
R132b	B	66	1 house	**68.6**	**68.4***	**N/A**	**N/A**	**1, 2**
R132d	B	66	1 house	**68.6**	64.4*	N/A	N/A	**3**
R149b	B	66	1 house	63.8	**73.0***	**N/A**	**N/A**	**1, 2**
R149d	B	66	1 house	63.8	**75.0***	**N/A**	**N/A**	**3**
R150b	B	66	1 house	59.8	65.3*	N/A	N/A	**1, 2**
R150d	B	66	1 house	59.8	**68.5***	**N/A**	**N/A**	**3**
R151b	B	66	1 house	60.9	**66.9***	**N/A**	**N/A**	**1, 2**
R151d	B	66	1 house	60.9	**70.8***	**N/A**	**N/A**	**3**
R152b	B	66	1 house	60.4	**66.2***	**N/A**	**N/A**	**1, 2**
R152d	B	66	1 house	60.4	**68.3***	**N/A**	**N/A**	**3**
R157b	B	66	1 house	59.3	64.4*	N/A	N/A	**1, 2**
R157d	B	66	1 house	59.3	64.4*	N/A	N/A	**3**

Receivers (homes) marked with a asterisk (*) would be relocated and are not considered for noise impact.
Receivers (homes) that are bold exceeded the NAC noise threshold.
NAC = Noise Abatement Criteria
CDOT = Colorado Department of Transportation
dBA = A-weighted decibels
Leq = dBA equivalent noise level

Nine receptor locations exceed the NAC B noise threshold limits, but none exceeded the 10 dBA increase criteria. Figures F-1 through F-23 in Appendix E depict the areas where exceeding future threshold contours (66 and 71 dBA) is expected. Note that the 71 dBA contour is shown only in sections with commercial uses.

Impacts Specific to No Action

Currently, eight receptor locations representing 20 homes (including the 13 in the mobile home park) are impacted by noise. These same 20 homes would continue to be impacted

in the future as traffic volumes increase. As the traffic volumes increase, the noise levels would increase. With traffic volumes expected to double, the noise levels can be assumed to increase 3.0 dBA. Using this assumption, 30 homes (including the 13 in the mobile home park) would be impacted by noise under the No Action Alternative. These locations are summarized in Table 3.15-4.

Table 3.15-4
2025 No Action Alternative Noise Impacted Properties

Receptor	Represents	Existing Conditions Leq	#Estimated No Action Alternative Leq
R27	1 house	**69.4**	**72.4**
R32	1 house, 1 outbuilding	**67.7**	**70.7**
R47	1 house, 4 outbuildings	**66.2**	**69.2**
R58	1 house, 2 outbuildings	65.0	**68.0**
R79	1 house	63.8	**66.8**
R80	1 house	63.7	**66.7**
P91	13 mobile homes, mobile home park	**66.8**	**69.8**
R91	1 house	63.2	**66.2**
R92	1 house	**67.8**	**70.8**
R93	1 house, 1 outbuilding	**70.0**	**73.0**
R125d	1 house	63.1	**66.1**
R127b	1 house	64.8	**67.8**
R127d	1 house	64.8	**67.8**
R132b	1 house	**68.6**	**71.6**
R132d	1 house	**68.6**	**71.6**
R149b	1 house	63.8	**66.8**
R149d	1 house	63.8	**66.8**

= assumed increase of noise levels of 3.0 dBA over existing levels due to doubling of traffic volumes
Receivers (homes) that are bold exceeded the NAC noise threshold.
NAC = Noise Abatement Criteria
CDOT = Colorado Department of Transportation
dBA = A-weighted decibels
Leq = dBA equivalent noise level

Impacts Common to all Action Alternatives

All of the action alternatives include widening of US 550. A number of homes would be acquired and removed, and residents relocated. Those homes that would be removed are not included in the summary of impacted properties. Those properties that would have noise impacts with any of the action alternatives are noted in Table 3.15-5. Five receptors representing 19 homes (including the 13 homes in the mobile home park) are impacted.

Table 3.15-5
2025 All Action Alternatives Noise Impacted Properties

Receptor	Represents	Existing Conditions Leq	2025 Alternatives 1, 2, & 3 Leq
R27	1 house	**69.4**	**66.8**
R33	1 house, 3 outbuilding	58.9	**66.1**
R34	1 house	59.8	**67.6**
P91	13 mobile homes, mobile home park	**66.8**	**67.7**
R111	3 houses, 3 outbuildings	59.8	**66.5**

Receivers (homes) that are bold exceeded the NAC noise threshold.
NAC = Noise Abatement Criteria
CDOT = Colorado Department of Transportation
dBA = A-weighted decibels
Leq = dBA equivalent noise level

Impacts Specific to Alternative 1

Alternative 1 would impact two additional receptors representing three homes as noted in Table 3.15-6.

Table 3.15-6
2025 Alternative 1 Noise Impacted Properties

Receptor	Represents	Existing Conditions Leq	2025 Alternative Leq
R119b	1 house	61.8	**67.6**
R124b	2 houses	60.6	**66.1**

Receivers (homes) that are bold exceeded the NAC noise threshold.
dBA = A-weighted decibels
Leq = dBA equivalent noise level

Impacts Specific to Alternative 2

There are no receptors impacted by Alternative 2 that are not also impacted by Alternative 1. Alternative 1 and 2 are very similar and have similar impacts to two receptors representing three homes.

Impacts Specific to Alternative 3

Additional impacts associated with Alternative 3 are two receptors representing two homes as noted in Table 3.15-7.

Table 3.15-7
2025 Alternative 3 Noise Impacted Properties

Receptor	Represents	Existing Conditions Leq	2025 Alternative Leq
R119d	1 house	61.8	**68.9**
R125d	1 house	63.1	**69.6**

Receivers (homes) that are bold exceeded the NAC noise threshold.
NAC = Noise Abatement Criteria
CDOT = Colorado Department of Transportation
dBA = A-weighted decibels
Leq = dBA equivalent noise level

3.15.3 Mitigation Measures (Preferred Alternative)

Issue N-1: Five Isolated homes and 13 homes within the mobile home park would experience operational noise levels exceeding NAC B noise threshold limits.

Mitigation Measure N-1: Along US 550 from Station 540+00 to 560+00 in Section 3, a number of mobile homes exist on the westside of the highway. These mobile homes are in close proximity to US 550, but would be set far enough back from the proposed alignment of US 550 to remain in place. For noise mitigation to be considered, a cost-effective continuous wall would have to be built the entire length of the mobile home park. This often cannot be accomplished for housing areas due to wall openings required for driveways and the great distances between the homes.

Those receptors that meet or exceed the NAC noise abatement criteria under the Preferred Alternative (Alternative 2) are listed in Table 3.15-8. If noise mitigation was determined to not be reasonable, the reasons are noted in the table. The noise analysis and abatement guideline worksheets (CDOT Form 1209) were used to investigate the feasibility and reasonableness for each impacted location. Mitigation measures, to be considered reasonable must achieve a 5-dBA or greater noise reduction for the front row receptors without engineering difficulties such as breaks or gaps in the barrier.

Consistent with federal guidance, CDOT also requires that noise abatement meet tests of reasonability, including both achieving a substantial noise reduction (at least 5 dBA) and achieving a reasonable noise reduction per dollar spent. The reasonableness/cost-effectiveness criteria are specifically defined as a cost per decibel of noise reduction per receiver (less than $3,000 – Extremely Reasonable; $3,000-$3,750 – Reasonable; $3,750-$4,000 – Marginally Reasonable; more than $4,000 – Unreasonable). The values shown in this discussion are based on a cost of $30.00 per square foot.

Table 3.15-8
Noise Mitigation Location Summary

Receptor	Represents	Notes
R27	1 house	Isolated- found Unreasonable
R33	1 house, 3 outbuildings	Isolated - found Unreasonable
R34	1 house	Isolated - found Unreasonable
P91	13 mobile homes, mobile home park	Modeled – See Table 5
R111	3 houses- 1 mobile, 2 houses, outbuildings	Isolated - found Unreasonable
R124b	2 houses	Isolated - found Unreasonable

Isolated homes - Five receptors representing eight homes exceeded the NAC B noise threshold limit but were not considered for noise barriers due to the distances between houses and the need for driveway access. In cases such as this, when houses are located at great distances apart and there is a need for breaks in the noise barrier for driveways, noise mitigation is typically not effective and not considered reasonable.

Mobile Home Park - During the evaluation process, only receptor P91 exceeded the NAC B noise threshold limits; however, in order to effectively manage noise mitigation a wall was evaluated the entire length of the mobile home park. The modeled wall was 8 feet high and 1,800 feet long, the analysis assumed a wall cost of $30 per square foot, resulting in a wall costing $432,000. CDOT Form 1209 has been included in Appendix E. The location of the analyzed barrier is shown in figure F-24 of Appendix E.

An assessment of cost per impacted receiver per decibel was calculated to determine the reasonableness of building the noise barrier with no driveway openings. The driveway opening will be relocated to the roadway south of the site. The analysis determined that an average 8.14-dBA reduction would result in a cost of $855 per decibel per impacted receiver for this location. This is well below the current CDOT allowable minimum of $3,000 per impacted receiver per decibel, and considered to be extremely reasonable. Table 3.15-9 summarizes the specific cost per benefit (cost reasonableness value).

Table 3.15-9
Wall Analysis Summary

Rec.	Description	No Wall	With 8-ft Wall	Noise Reduction	Total dBA Reduction
P89	10 mobile homes, mobile home park	63.1	55.3	7.8	78
P90	6 mobile homes, mobile home park	59.7	53.5	6.2	37.2
P91	13 mobile homes, mobile home park	67.7	51.7	16.0	208
P93	13 mobile homes, mobile home park	60.6	55.2	5.4	70.2
P94	12 mobile homes, mobile home park	59.6	54.9	4.7	56.4
P95	7 mobile homes, mobile home park	64.0	57.5	6.5	45.5
R89	Apartment Building	65.4	55.5	9.9	9.9
Totals	**62 structures**			**56.5**	**505.2**

A wall length of 1,800 feet long and 8 feet high is considered reasonable for noise mitigation at the Mobile Home Park and noise mitigation is recommended. The affected owners will be contacted to confirm their desire for noise mitigation during the design phase of this project.

Issue N-2: Construction noise would cause a temporary disturbance to local residents. Construction would generate noise from diesel-powered earth-moving equipment such as dump trucks and bulldozers, back-up alarms on certain equipment, compressors, and pile drivers. Construction noises at off-site receptor locations will usually be dependent on the loudest one or two pieces of equipment operating at the moment. Noise levels from diesel-powered equipment range from 80 to 95 dBA at a distance of 50 feet. Impact equipment such as rock drills and pile drivers can generate higher noise levels.

Mitigation Measure N-2: Construction noise impacts, while temporary, will be mitigated, where reasonable, by limiting work to daylight hours, requiring the contractor to use well-maintained equipment (especially with respect to mufflers), and through the use of additional measures such as temporary noise barriers where applicable.

Effectiveness: Mitigation Measure N-1 and N-2 would provide operational noise levels below existing conditions for the 13 impacted homes within the mobile home park and effectively reduce construction noise levels.

3.15.4 Residual Adverse Impacts

Construction activities would cause short-term elevated noise levels and noise impacts near construction zones. Eight homes that do not qualify for noise mitigation (mitigation not being feasible or reasonable to provide) would be impacted by traffic noise from US 550.

3.16 VISUAL RESOURCES

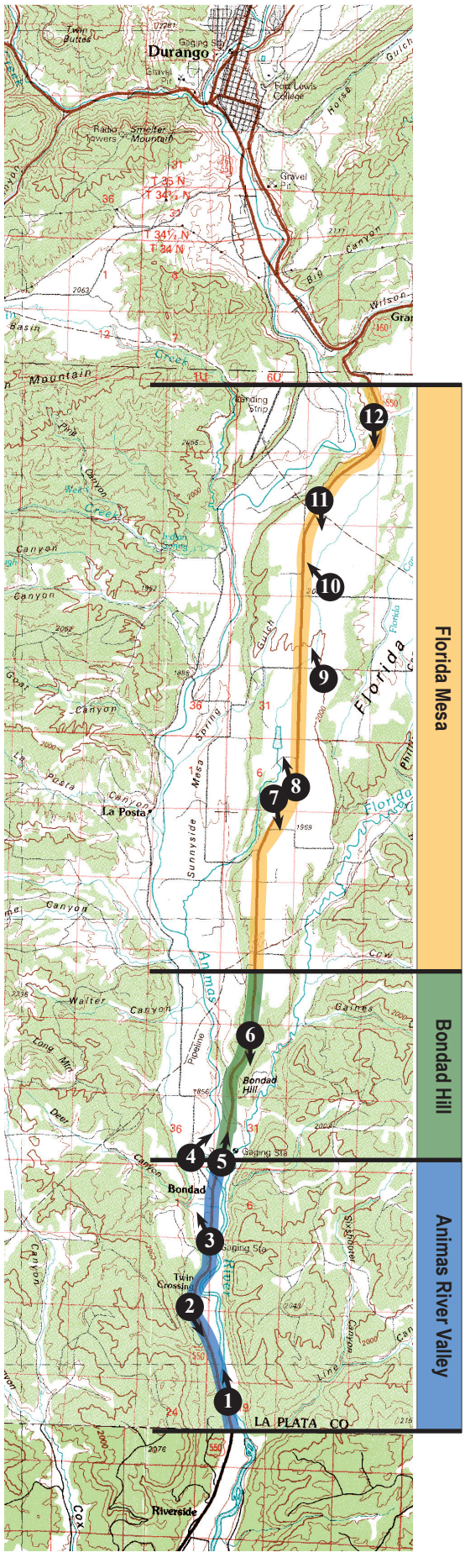
3.16.1 Affected Environment

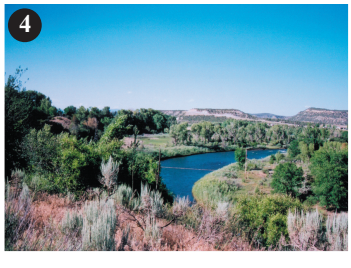
The visual resources of the project area are described by the overall scenic quality or visual appeal of the landscape, the existing scenic condition or scenic integrity of the landscape, and the sensitivity to visual change in the landscape.

The scenic quality of an area can be described by evaluating landscape features such as landform, vegetation, water features, color, adjacent scenery, scarcity, and cultural modifications, and comparing those features with those typically found within the region. The existing scenic condition indicates the integrity or the degree of intactness of the landscape character. Visual sensitivity of an area is a function of the type and number of viewers, importance of the travel route, surrounding land uses, and the presence or absence of important geological, historical, or biological features. Visual sensitivity is high along the entire corridor due to the high traffic levels, the presence of recreationists and other tourists who use the highway, and residential areas scattered along the corridor. Scenic quality and existing scenic integrity are discussed by landscape subtype below.

The project area is located in the Navajo Section of the Colorado Plateau Physiographic Province (Fenneman 1931). The landscape within this section typically consists of mesas, foothills, and stream valleys. The climate is semiarid with hot, dry summers and usually dry, cold winters. The San Juan Mountains, located to the north of the project area, are visible from much of the road corridor. Natural vegetation includes desert scrub on the mesas (big sagebrush is the dominant species), riparian vegetation (narrow-leaf cottonwood and willows) along the stream valleys, and conifer woodland (piñon-juniper) in scattered areas within the foothills and mesas.

Within the project area, there are three distinct visual landscape character types based on relatively homogeneous combinations of topography, landcover, and land use. Traveling north from the start of the project at the Colorado/New Mexico state line, the subtypes include the Animas River Valley, Bondad Hill, and Florida Mesa. These areas are identified in Figure 3.16-1. Picture number references in the following discussion refer to photograph numbers shown in Figure 3.16-1.





US 550

DOT

U.S. 550

Figure 3.16.1
Landscape Character Types

Animas River Valley

The Animas River Valley (Photographs 1, 2, 3, and 4) is characterized by the Animas River and its associated linear band of riparian vegetation and floodplain, and the often steep, piñon-juniper covered side slopes. Narrowleaf cottonwoods and willows visually dominate the riparian vegetation, and the water provides an uncommon water feature in this arid environment. The river valley varies in width, from the state line area where the valley is narrow with abrupt and steep side slopes, to the northern end where the valley floor starts to widen, especially on the west side of the highway corridor. Land use is primarily agricultural with scattered residential development. Natural gas developments have been increasing in occurrence in La Plata County, and gas development is visually noticeable in several locations along the US 550 corridor.

Scenic quality along the river and adjacent riparian vegetation is high, due to the water feature and the diversity of vegetation. Away from the immediate river corridor the scenic quality is moderate. The side slopes with piñon-juniper vegetation and the valley floor with agricultural land use lack any outstanding or unique scenic qualities and are landscapes common to the area. Scenic integrity is rated as moderate. The scenic character of the landscape is generally intact, except for some scattered gas well development.

Bondad Hill

Bondad Hill (Photographs 5 and 6) is the transition between the Animas River Valley to the south and Florida Mesa to the north. This unique landscape type is characterized by woodland vegetation and the prominence of Bondad Hill, which is the steepest topographical feature along the project area. Photograph 5 was taken south of Bondad Hill looking north at the highway alignment on the south slope of Bondad Hill. The existing US 550 road cut is on the west side (left side of photo) of the hill in this view. As shown in the photograph, the hill is generally natural appearing and covered with native piñon-juniper vegetation, except for the area of the road cut, which has impacted the continuity of the slope and the native vegetation. This has created a strong color contrast between the light colored soil/rock of the road cut and the surrounding evergreen vegetation. Scenic quality is rated as moderate. The scenic integrity of Bondad Hill is rated as moderate, except for the existing US 550 road cut, where the natural scenic integrity has been substantially modified resulting in a low scenic integrity rating.

Florida Mesa

Florida Mesa (Photographs 7 through 12) is characterized by its flat landform, absence of tall vegetation, agricultural land use, and panoramic views of the surrounding landscape, including the mountains north of Durango. This landscape includes several areas of development, including Sunnyside Elementary School, shown in Photograph 7, which is located adjacent to the existing highway ROW. Photographs 8, 9, and 10 emphasize the flat topography, agricultural production, and long-distance vistas that characterize the landscape character type of this section of the project area. Scenic quality is rated as moderate, as the scenery and the cultural modifications are common for the region. The scenic integrity of what is primarily an agricultural landscape is rated as moderate.

3.16.2 Environmental Consequences

Impacts Specific to No Action

Under the No Action Alternative, the proposed project would not be built, and the highway would maintain its current condition. Visual resources along the corridor would remain the same, without the potential positive or negative effects associated with the action alternatives.

Impacts Common to all Action Alternatives

The degree to which the US 550 highway improvement project would affect scenic resources depends on the amount of visual contrast that is created by project components in relation to the existing landscape character. The amount of contrast or compatibility between the project and the existing landscape features is assessed by an analysis of the potential change in the basic visual elements (line, form, color, and texture) and how the project would affect the dominance, scale, diversity, and continuity of the existing landscape features. A change in the highway location and configuration can affect both the view from the highway and the view of the highway from nearby sensitive viewpoints such as residential or recreation areas.

The first several miles of the project corridor have already undergone reconstruction to a four-lane highway and/or ROW preparation for construction of an expanded roadway. Photograph 1 in Figure 3.16-1 shows the section of US 550 in this area that has already been reconstructed to a four-lane configuration and provides a good picture of the future appearance of US 550 for the project corridor. As shown, the total highway width is about 138 feet, which includes an approximately 46-foot center median and 10-foot shoulders on each side of the highway. This footprint increases the scale and visual dominance of the highway in the landscape. Additionally, the removal of roadside vegetation for construction would increase the visual impact of the roadway by increasing the contrast between construction areas and the surrounding landscape.

The visual character of US 550 within the project area would change from a relatively narrow road corridor typical of a rural landscape to a major highway corridor. Although the expanded highway footprint would impact the rural character to some extent, it also provides motorists with a greatly improved driving experience, increasing the value of US 550 for scenic driving.

Scenic quality of the Animas River is rated as a high quality visual resource. The new crossing of US 550 would not have a substantial impact of the visual resources of the river; the new bridge would replace the old bridge in generally the same location, and impacts to riparian vegetation would be minimized.

Between MP 0.0 and the Animas River crossing, there are no residences that would experience a visual impact due to the project. The ROW would be expanded in several locations from the existing condition, but would generally be in the same location, and residences in the area would not experience any substantial change in the existing visual condition of their surroundings.

CR 318 intersects US 550 just south of Bondad Hill. The new expanded ROW would move closer to three houses near this intersection, and one of these houses may be

relocated. For the two remaining houses, the new US 550 alignment would cause an incremental increase in visual impacts due to the proximity of traffic to the homes. These homes are already built in an area visually affected by US 550 and the adjacent CR, however the closer ROW would have an additive effect.

On Florida Mesa, the US 550 alignment would generally be centered on the existing alignment with slight shifts in some areas to reduce disturbance to adjacent land use. The most concentrated area of residential land use and other sensitive land uses occurs in the area of Sunnyside Elementary School near the intersection with CR 218. Currently, a mobile home park, scattered residences, and the school are located in this area. Visual impacts to the mobile home park would be minor as the alignment is shifted slightly to the east to avoid impacts. Several houses on the east side of the road would be impacted by the closer highway alignment, and there would be at least one relocation in this area. For the homes that are not relocated, the new highway alignment would cause an incremental increase in the visual effects the highway has on the aesthetics of the surroundings. A noise wall would be constructed at the Old Homestead Mobile Home Park that would cause an incremental increase in visual impacts. However, the noise wall would be constructed with materials that blend into the natural setting.

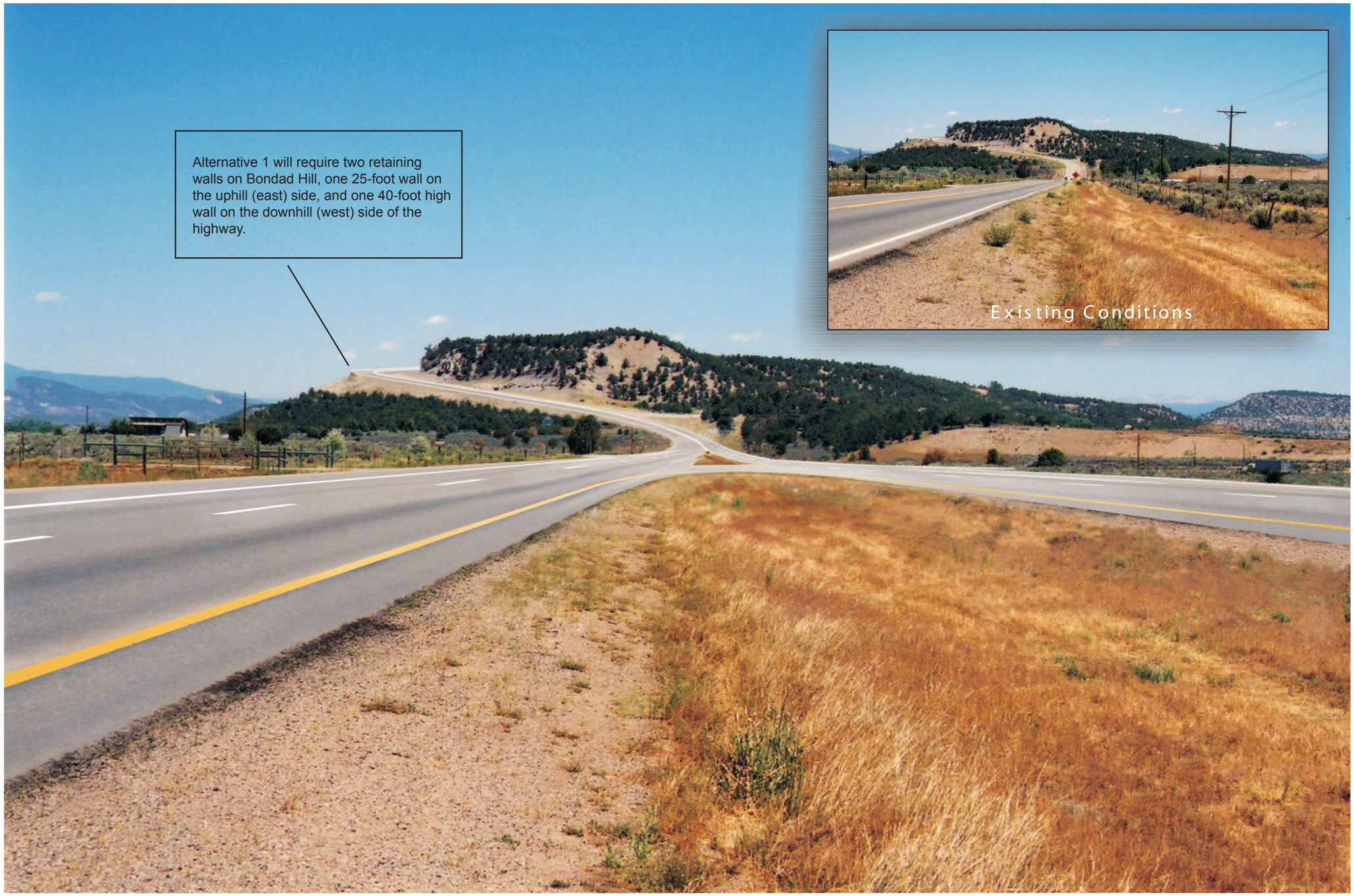
North of the Sunnyside Elementary School (MP 8.8 to MP 15.4), the reconstructed highway would generally follow the existing alignment, with slight shifts in certain locations to flatten horizontal curves, and to reduce impacts to adjacent land uses. Scattered residences are located adjacent to the highway in several locations. The expanded ROW required for the four-lane reconstruction would move the outer limits of the ROW closer to several of these residences, impacting the aesthetics surrounding the homes. In these situations, the residences are already located along the highway corridor and the reconstructed highway would not be a new visual influence on the surroundings, but would move closer in some cases causing a incremental increase in the visual influence of the highway on these residences.

Impacts Specific to Alternative 1

The alignment of US 550 on Bondad Hill would remain generally in the current alignment, with slight shifts to flatten horizontal curves. The limits of disturbance of the new ROW would include a portion of the hill below the existing highway, requiring the clearing of some piñon-juniper vegetation and increasing the overall profile of the road cut. As shown in Figure 3.16-2, this would cause a slight increase in disturbance to the natural topography of the hill, and increase the visual contrasts of the highway in the landscape, especially as viewed from below in the Animas River Valley. Two retaining walls, one above the roadway and one below, would be included as part of the design for Alternative 1.

Impacts Specific to Alternative 2 (Preferred Alternative)

Alternative 2 would move US 550 slightly east of the current alignment in order to flatten the horizontal curve and to reduce the grade of the roadway. This would result in a considerable amount of excavation of the hillside, impacting the continuity of the topography and vegetation on the hill. Figure 3.16-3 shows the new alignment and how the extent of the road cuts and fills would impact the natural shape and appearance of



US 550

DOT

US 550 EA

Photo Simulation
Alternative 1

03/19/04

Figure 3.16 -2

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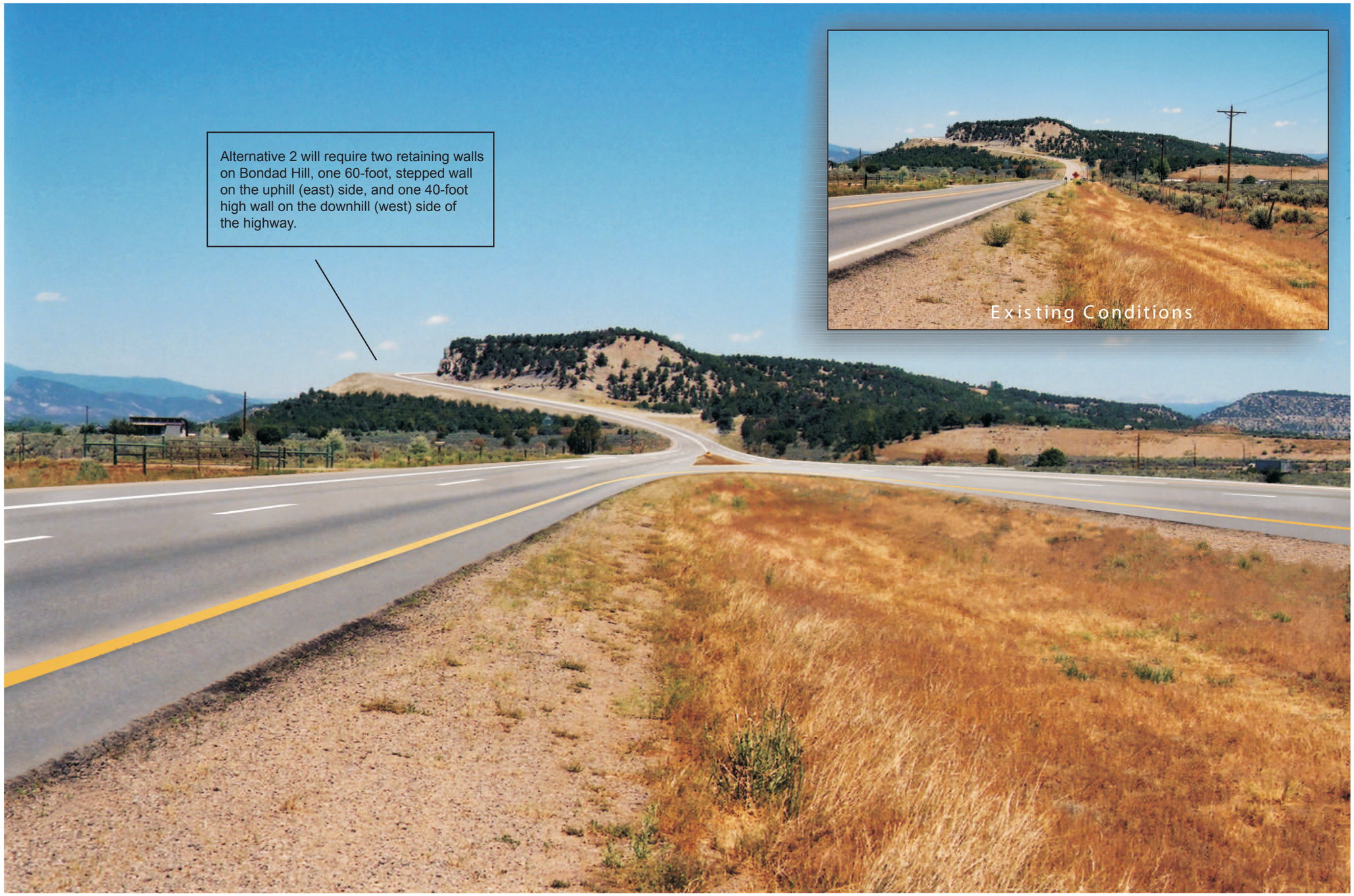

US 550

DOT

US 550 EA

Photo Simulation
Alternative 2

03/19/04

Figure 3.16-3

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US 550

DOT

US 550 EA

Photo Simulation
Alternative 3

03/19/04

Figure 3.16-4

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Bondad Hill. The new alignment would also result in a larger area of exposed rock wall on the east side of the highway, increasing the color contrasts of the road cut as viewed from locations in the river valley below. Two retaining walls, one above the roadway and one below, would be included as part of the design for Alternative 2.

Impacts Specific to Alternative 3

In Alternative 3, the alignment of US 550 on Bondad Hill would shift to the east side of the hill. This would result in a new disturbance, impacting the natural vegetation, topography, and land use in that area. The new highway alignment would be in the foreground viewshed of an existing residence on the east side of the hill, impacting the quality of the scenery as viewed from that location. Figure 3.16-4 shows the new alignment. Alternative 3 would create a substantial change in the scenery of the entire east side of Bondad Hill as viewed from the valley below. Reclamation of the old US 550 alignment on the west side of Bondad Hill would help reduce the visual contrasts in that area; however, long-term impacts to the natural topography would remain.

3.16.3 Mitigation Measures (Preferred Alternative)

Issue V-1: Additional excavation and cuts and fills required for construction of the Preferred Alternative in the Bondad Hill area would create a visual impact by increasing the topographic and color contrast between the highway and the surrounding landscape.

Mitigation measures V-1A: The required cut line will be blended into the existing terrain to reduce the topographic contrast between cut slopes and the surrounding landscape.

Mitigation Measure V-1B: To reduce the color contrast between fill slopes and the surrounding landscape, excess waste material excavated during construction will not be downcast on the downhill slope.

Mitigation Measure V-1C: Retaining walls for cut and fill slopes will be consistent with the general design of the retaining walls used in areas along US 550 just north of the New Mexico state line. The color of the retaining wall will be selected to reduce color contrasts with the surrounding vegetation.

Issue V-2: The removal of roadside vegetation increases the visual impact of the roadway by increasing the contrast between construction areas and the surrounding landscape.

Mitigation measure V-2A: Removal of adjacent roadside vegetation will be minimized, where possible. In areas that will lose vegetation that currently provides an important visual screen, revegetation during reclamation will include taller plant species (trees and shrubs) that can serve the same function.

Effectiveness: The proposed mitigation measure for visual resources would decrease the contrast between construction areas and the surrounding landscape.

3.16.4 Residual Adverse Impacts

The primary residual visual effect of the preferred alternative would be the substantial change in the visual scale of the highway in the landscape, which would increase from two to four lanes. This would increase the width of the highway and the visual presence of the travel corridor in the viewshed. The required road cut on the west side of Bondad Hill would permanently change the topography, and the continuity of the natural landform.

3.17 HISTORIC AND ARCHAEOLOGICAL PRESERVATION

3.17.1 Affected Environment

Introduction

Section 106 of the National Historic Preservation Act (16 USC 470, as amended) and its implementing regulations (36 CFR 800) require federal agencies to consider the effects of a planned undertaking on historic properties. Historic properties consist of sites, buildings, structures, districts, or objects in excess of 50 years old that are eligible for or listed on the NRHP.

The Area of Potential Effects (APE) established for the analysis of historic properties consisted of a corridor 300-600 feet wide, corresponding to the conceptual ROW and the existing US 550 alignment along the 15.4-mile project corridor. The APE also included a block area encompassing approximately 187 acres at Bondad Hill, where alternative routes were considered. The APE incorporates the limits of the No Action Alternative and three action alternatives. Historic properties that may be impacted directly and/or indirectly by one or more of the action alternatives are discussed below.

Inventory Methods

Background information and a list of previously documented sites within the APE were compiled from records available on COMPASS, an on-line cultural resource database maintained by the Colorado Office of Archaeology and Historic Preservation (OAHP). In addition, the CDOT Staff Historian conducted a search of the statewide bridge inventory files housed at CDOT. No bridges eligible for the NRHP are located in the APE.

Two historic property surveys were completed along portions of the US 550 corridor in the 1990s prior to transportation improvement projects. In 1990, Alpine Archaeological Consultants, Inc. surveyed US 550 from the New Mexico border to MP 5.0 at the foot of Bondad Hill (Chandler 1990). Weaselskin Land and Cultural Services, Inc. surveyed small segments of the highway ROW from the state line north to Twin Crossings in 1997 (Robinson 1997).

As part of the NEPA documentation for the present undertaking, in 2001 Múukui-ci Cultural and Environmental Services surveyed 187 acres of SUIT and private lands along US 550 at and surrounding Bondad Hill (Barnett 2001). In 2002, URS Corporation surveyed approximately 11 linear miles of the US 550 corridor, from just south of

Bondad Hill (MP 4.4) to County Road 220 at the top of Farmington Hill (MP 15.75) (Barclay 2002; URS 2002b). Finally, in late 2003, URS Corporation surveyed 10 discrete areas that encompassed 81 acres for access alternatives and intersection improvements (Tucker 2003). These survey corridors included all of the action alternatives as well as their associated facilities.

All of the historic properties in the study area were evaluated for NRHP eligibility. A site is considered eligible for listing on the NRHP if it meets at least one of the four significance criteria identified below, and retains enough integrity to express its significance (USDI 1990):

(a) Associated with events that have made significant contribution to the broad patterns of our history

(b) Associated with the lives of persons significant in our past

(c) Possess distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) Have yielded, or may be likely to yield, information important in prehistory or history.

Consultation between CDOT, FHWA, and the State Historic Preservation Officer (SHPO) for that portion of the project north of Bondad Hill was conducted in 2002 and 2003. In October 2002, CDOT and FHWA requested and received concurrence from the SHPO on determinations of eligibility for the archaeological sites within the APE. In November 2002, CDOT and FHWA requested concurrence with the determinations of eligibility for the historic structural sites located in the APE. In a letter dated May 16, 2003, the SHPO concurred with these determinations with the exception of two sites, for which additional data was requested.

After additional research, CDOT and FHWA revised the determinations for the two sites to not eligible, an evaluation with which the SHPO concurred in a letter dated August 8, 2003. In February 2004, CDOT and FHWA advised SHPO that the APE for the EA had been extended south from Bondad Hill to the New Mexico state line in order to capture eight previously documented sites that had not been incorporated into the initial impact assessment. CDOT and FHWA submitted effects determinations to SHPO for the archaeological resources in a letter dated July 14, 2004, and for historic resources in a letter dated March 31, 2005. SHPO concurred with the determinations of effect for archaeological resources on July 21, 2004, and for historic resources on April 6, 2005. Copies of all interagency correspondence related to Section 106 compliance are present in Appendix I.

Native American Consultation

Section 106 of the Natural Historic Preservation Act (NHPA) and the Advisory Council on Historic Preservation regulations (36 CFR 800) mandate that federal agencies must involve interested Native American tribes in the planning process for federal undertakings. Consultation with a Native American tribe recognizes the government-to-

government relationship between the United States government and sovereign tribal groups. In that context, federal agencies must be sensitive to the fact that historic properties of religious and cultural significance to one or more tribes may be located on ancestral, aboriginal, or ceded lands within or beyond modern reservation boundaries. Consulting tribes are offered the opportunity to identify concerns about cultural resources and comment on how the project might affect them. If it is found that the project would impact cultural resources that are eligible for inclusion on the NRHP and are of religious or cultural significance to one or more consulting tribes, their role in the consultation process may also include participation in resolving how best to avoid, minimize, or mitigate those impacts. By describing the proposed undertaking and the nature of known cultural sites, and consulting with the interested Native American community, FHWA and CDOT strive to effectively protect areas important to American Indian people.

As noted elsewhere in this document, the US 550 corridor is located entirely within the external boundary of the SUIT reservation, and portions of several alignment alternatives bisect lands owned by the tribe. As such, government-to-government Section 106 consultation was initiated with SUIT early in the corridor identification and documentation process, in concert with general communication and coordination between CDOT and the tribe. As noted in a June 5, 2002 correspondence from URS Corporation to CDOT Region 5 (Appendix I), FHWA and CDOT initiated coordination with SUIT representatives regarding a wide variety of issues in the mid-1990's during completion of the US 550 Corridor Feasibility Study.

Following an Agency Scoping Meeting and subsequent presentation to the SUIT Tribal Council in late 2001, CDOT planned and completed the Section 106 cultural resources surveys and site evaluations for the EA (as described in this section), in consultation with SUIT. Correspondence related to these actions is in Appendix I. The tribe participated in all phases of the Section 106 documentation and concurred with all resource recommendations in the context of the EA corridor. FHWA and CDOT continued to coordinate closely with the tribe throughout the EA process, including a presentation of data specific to the location of, and potential impacts to, known historic properties relative to alignment alternatives, held at the SUIT complex in Ignacio on January 29, 2004. A subsequent meeting with SUIT representatives regarding direct effects to NRHP-eligible archaeological sites was held on June 23, 2004, at the CDOT Region 5 offices.

Results

The surveys of the APE resulted in the new documentation or reevaluation of 21 historic structural sites, 47 historic and prehistoric archaeological sites, and 43 archaeological isolated finds. Of these, 10 prehistoric sites are officially eligible for the NRHP based on the presence of significant intact buried cultural deposits, and 11 require additional data from small-scale controlled excavations before a final National Register evaluation can be completed. The remaining historic and archaeological sites and isolates are not eligible for National Register listing. Per the direction of SUIT, archaeological sites within the APE located on SUIT lands that are not eligible for the NRHP would require an archaeological and/or tribal monitor if they are within the impact area of the Preferred Alternative and cannot be avoided.

3.17.2 Environmental Consequences

Impacts Specific to the No Action Alternative

The No Action Alternative would result in no impacts to historic properties.

Impacts Common to All Action Alternatives

Each of the action alternatives has the potential to impact NRHP eligible historic properties. However, none of the 11 sites evaluated as needing additional data prior to a final National Register eligibility determination would be affected by any of the alternatives. As such, no further work is necessary at the "need data" sites as a result of this undertaking.

Two archaeological sites, 5LP2580 and 5LP6665, would be impacted by all three action alternatives. The Twin Rocks Community Ditch (5LP2580) parallels and crosses a previously improved section of US 550 near the state line. The ditch was documented to Historic American Engineering Record (HAER) standards in 1990 because it is located in an area affected by a previous highway widening project. The only construction activity planned for the area containing 5LP2580 is the installation of deer fencing, as detailed in Chapter 2. Given the magnitude and extent of previous disturbances and the fact that the site has been satisfactorily documented to HAER standards, this activity would have no adverse effect on the site. The SHPO concurred with this determination in 2004.

A substantial portion of 5LP6665, a large prehistoric hamlet, lies within the conceptual ROWs for all three action alternatives, and impacts are therefore anticipated for this site as a result of the use of heavy earth-moving equipment. Areas of 5LP6665 that contain intact archaeological deposits would be completely or partially removed during construction of the new highway alignment, and the site's physical integrity would thereby be comprised. However, both SHPO and SUIT have concurred with FHWA and CDOT's evaluation that the site is significant primarily because of what can be learned by data recovery excavations, and it has minimal value for preservation in place.

Prehistoric sites 5LP2616 and 5LP6456, which are not eligible for the NRHP, are within the conceptual ROW for all action alternatives. As noted earlier, SUIT requires that initial construction at all non-eligible archaeological sites on tribally-owned lands within the direct impact area be monitored by a qualified archaeologist and/or tribal member in order to ensure the absence of subsurface Native American artifacts. Ground disturbances during construction are expected at both 5LP2616 and 5LP6456 as a result of the use of heavy earth-moving equipment.

Impacts Specific to Alternative 1

Alternative 1 would have the same impacts to historic properties as outlined under *Impacts Common o all Action Alternatives, above.*

Impacts Specific to Alternative 2

Alternative 2 would have the same impacts to historic properties as outlined under *Impacts Common to all Action Alternatives,* above.

Impacts Specific to Alternative 3

In addition to impacts common to all action alternatives as described above, a significant portion of prehistoric archaeological site 5LP5949 lies within the conceptual ROW for Alternative 3. Cultural remains at the NRHP eligible site would be completely or partially destroyed as a result of the use of heavy earth-moving equipment to construct the new highway alignment. Like 5LP6555, site 5LP5949 is considered of minimal value for preservation in place.

3.17.3 Mitigation Measures (Preferred Alternative)

Issue C-1: CDOT has determined that the Preferred Alternative would have an adverse effect on site 5LP 6665. Both the SHPO and SUIT have concurred with this assessment.

Mitigation Measure C-1: Mitigation of adverse effects to 5LP6665 can be most effectively accomplished through large-scale controlled archaeological excavations, as the importance of this site lies chiefly in what can be learned by data recovery. The parameters of these mitigation efforts will be outlined in a Memorandum of Agreement (MOA) prepared by CDOT, and executed by FHWA, CDOT, SHPO, and SUIT, in consultation with the Advisory Council on Historic Preservation (ACHP).

Effectiveness: Data recovery excavations at 5LP6665 would preclude the loss of important archaeological information as a result of construction.

Issue C-2: Impacts to non-NRHP-eligible sites 5LP2616 and 5LP6456 on SUIT lands.

Mitigation Measure C-2: Monitoring by a qualified archaeologist and/or a SUIT tribal member will be required during construction to ascertain the extent of impacts, if any, to 5LP2616 and 5LP6456. If such monitoring determines that these sites contain significant archaeological deposits that will be affected, mitigation of adverse effects will also be accomplished through data recovery excavations, as outlined in the MOA referenced above.

Effectiveness: Monitoring would ascertain the nature and extent of buried cultural materials at 5LP2616 and 5LP6456, and data recovery excavations (if necessary and appropriate) would preclude the loss of important archaeological data.

3.17.4 Residual Adverse Impacts

Upon implementation of the data recovery excavations described above, adverse effects to NRHP eligible site 5LP6665 would be effectively mitigated.

3.18 HAZARDOUS MATERIALS

The potential for the existence of hazardous materials and hazardous waste in the study area was evaluated by conducting a Modified Environmental Site Assessment (M-ESA) (URS 2002a).

The M-ESA was performed with the purpose of providing a professional opinion on the potential current presence of Recognized Environmental Conditions (RECs) at the site, including potential impacts from known problems in the surrounding area. The term

"Recognized Environmental Conditions," as defined by American Society for Testing and Materials (ASTM) Designation E 1527-00, means:

> "the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include *de minimus* conditions that generally do not present a material risk of harm to public health or the environment and that generally will not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimus* are not "Recognized Environmental Conditions."

Information on potential hazardous materials or wastes in the project area was obtained by the following methods:

- Visual site reconnaissance of the project corridor;
- Historic records review;
- Interviews with land and business owners;
- Search for oil and gas well and production facilities within the corridor; and
- An environmental regulatory agency database search of the study area and adjoining properties was ordered from VISTA Information Solutions (VISTA) (VISTA 2001). The VISTA report presents the results of a search of federal and state databases, along with a description of each database. The report reviews databases for registered underground storage tanks (USTs); registered aboveground storage tanks (ASTs); leaking underground storage tank sites (LUSTs); Resource Conservation and Recovery Information System (RCRIS) hazardous waste generators; landfill sites; RCRIS hazardous waste treatment, storage and disposal facilities; Comprehensive Environmental Response, Compensation and Liability Information System sites (CERCLIS); USEPA Emergency Response Notification System (ERNS); Colorado State Spills List (SPILLS) sites

3.18.1 Affected Environment

The original VISTA regulatory database and record search was completed on October 5, 2001. According to the ASTM Standard 1527-00, an Environmental Site Assessment is valid for 180 days from the date it was performed. An additional Satisfi regulatory database search was completed on October 29, 2004.

Existing and former commercial development within the study area is generally sparse, consisting of isolated businesses and oil and gas facilities. The following properties were identified through site reconnaissance and/or records reviews. Summarized below are the M-ESA and Satsifi regulatory database search findings for each of the sites investigated.

Twin Sister's Stage Shop

This facility, formerly Tucker's Outpost and the Stateline Store, is located at 1106 US Highway 550. This property contains two registered 6,000-gallon USTs, which are less than 5 years old and are currently inactive. There are no reported or observed releases at this site that may result in impacts; therefore, it is not a REC.

Twin Crossing Imports

Twin Crossing Imports, formerly Twin Crossing Trading Post, is located at 1929 US Highway 550. This facility is listed in the LUST database (Satisfi, 2004). The tank was removed in 1993 with no contamination observed or detected in the soil samples collected. There are no reported or observed releases at this site that may result in impacts; therefore, it is not a REC.

Old Sod Farm

The Old Sod Farm, also referred to as C&M Sod Farm, is located at 2680 La Plata CR 214, approximately 0.25 mile east of US 550. The facility was listed in the LUST and UST databases (Satisfi, 2004). The LUST, a 2,000-gallon UST containing gasoline, was removed from the site in 1991. Vapor monitoring was conducted and confirmation soil samples were collected. There were no odors observed or measured; no staining observed in the excavation walls or floor, and the soil sample analytical results were non-detect for benzene, toluene, ethylbenzene, xylenes, and total petroleum compounds. This property is adjacent to all the action alternatives, and is a potential REC.

Bodean's Custom Restoration and Collision

This facility, located at 12931 US Highway 550, is currently occupied by an auto restoration business. The facility is less than 50 feet from US 550 on the west side. Previous commercial uses, which date back to 1985, have included small gift pewter and jewelry manufacturing and gas well measurement equipment manufacturing. According to the property owner, in an interview in February 2002, there have never been any ASTs or USTs present on the property. There is a floor drain in the building connected to a septic tank for solids. Wastewater is discharged to a lagoon on the property. This property is adjacent to all the action alternatives, and is a potential REC.

Fire & Water Heating & Plumbing

This facility, formerly a Sonoco Service Station, is located at 13249 US Highway 550, less than 50 feet from US 550. The facility is located just north of the US 550/CR 219 intersection, west of US 550 and east of CR 219. The site has most recently been used for storage of used plumbing and heating equipment. The Sonoco Service Station was present and operational at the site in the 1940s through the early 1960s. A UST present at the site was removed pre-1989; therefore, no documentation is available of removal or closure activities. A site investigation was conducted on the property as part of the sales transaction with the current owners. No contamination was encountered on the investigation. This property is adjacent to all the action alternatives, and is a potential REC.

Welding Shop

The welding shop facility is located at 13505 Highway 550, less than 50 feet from US 550 north of the US 550/CR 219 intersection. The facility is located on the west side of US 550 and the east side of CR 219. The building was constructed in the early 1980s and has historically been used for multiple businesses, including a well drilling service. According to the present owners, no floor drains are located within the facility, and there have not been any ASTs or USTs on the property. This property is adjacent to all the action alternatives, and is a potential REC.

Mesa Propane Incorporated

Mesa Propane Incorporated is located at 13665 US Highway 550, approximately 75 feet west of US 550. Currently, the property is used as a propane distribution business that dates back to approximately the 1970s. The property also serves as a residence for the property owner. According to the owner, the property was used primarily for agricultural purposes prior to Mesa Propane Inc. This property is adjacent to all the action alternatives, and is a potential REC.

CR 219 Residential Property

On the site reconnaissance, several catch basins were observed at a residential property located at 14272 US Highway 550, across from CR 219. This property is located on the east side, approximately 200 feet from US 550. The catch basins are located within fenced enclosures north of the house. This property is adjacent to all the action alternatives, and is a potential REC.

Gravel Mining Operation

A large active gravel mining operation is located approximately 1 mile south of the US 550/CR 220 intersection along the east side of the corridor. Results of reviewed aerial photos indicate that gravel mining operations started some time between 1967 and 1975. Access was not provided to this property at the time of the site reconnaissance. Based on the distance of the operation from US 550, the site should not be of environmental concern; therefore it is not a REC.

Additional Issues of Concern

Fuel Spill on Bondad Hill

A gasoline tanker overturned on US 550 at Bondad Hill on January 7, 2004, spilling approximately 5,300 gallons of fuel. The spill occurred along the east side of US 550 north of the intersection with CR 310. According to CDPHE, the area was remediated by removing 1,500 to 2,000 cubic yards of soil. Confirmation samples collected by the remediation contractor all showed non-detectable concentrations of residual petroleum hydrocarbons. A No Further Action (NFA) report will be published when the area is successfully revegetated. This property is adjacent to all the action alternatives, and is a potential REC, although based on remedial actions it is a low priority REC.

Oil and Gas Facilities

According to a February 2004 search of the Colorado Oil and Gas Conservation Commission Web site, there are 10 oil and gas facilities of varying sizes identified within

approximately 300 feet of US 550 (COGCC 2003). These sites are identified in Table 3.18-1. There is a potential for subsurface releases with no observable indications at the facilities themselves and along the associated gathering and transmission pipeline infrastructure. Subsurface soil testing adjacent to these natural gas production, gathering, and transmission facilities for the Preferred Alternative is recommended.

Oil and gas facilities are typically connected to pipelines, which distribute the product to central locations for further transport. These pipelines are known to leak petroleum products into adjacent soils, and may trend parallel to roadways. Oil and gas facilities, and associated gathering and transmission pipeline infrastructure that will be impacted or disturbed constitute a potential REC.

Table 3.18-1
Oil and Gas Facilities

Owner	Facility Name	Distance (feet) and direction from US 550	Township, Range, Section
BP America Production Company	Joe A Hotter Gas Unit	170 feet North	T34N R9W Section 17
BP America Production Company	Hotter Gas Unit A 2	200 feet East	T34N R9W Section 17
BP America Production Company	Hotter Gas Unit A1	50 feet East	T34N R9W Section 17
BP America Production Company	Weaselskin Gas Unit 1	250 feet West	T34N R9W Section 19
Williams Production Company	6 Bondad 33-9	280 feet East	T33N R9W Section 7
BP America Production Company	2 Alva Short Gas Unit A	200 feet West	T33N R9W Section 7
BP America Production Company	30-2 Southern Ute 33-9	230 feet East	T33N R9W Section 30
Spatter Nick	Nick Spatter-Bryce Farm 1	250 feet East	T33N R9W Section 31
McKenzie Methane Corporation	Bonds 5-1 WDW	110 feet West	T32N R10W Section 1
Williams Production Company	7 NW Cedar Hills 32-10	215 feet West	T32N R10W Section 12

Aboveground Storage Tanks

Prior to ROW acquisition, CDOT should confirm the presence/absence of ASTs. It is possible that one or more other residential property or small business owners within the study area could utilize an AST for fueling personal or farm vehicles. Smaller ASTs may not be on the list of registered ASTs because according to state petroleum storage tank regulations, any AST whose capacity is less than 600 gallons is not required to be registered. Any surface staining in the vicinity of an AST constitutes a REC.

Underground Storage Tanks

Prior to ROW acquisition, CDOT should confirm the presence/absence of USTs. Interviews with the property owners and a site reconnaissance should be conducted to check for old fill pipes associated with USTs and leaks or stains associated with USTs. It is possible that USTs are present on one or more of the residential or small business

properties for use by owners for fueling personal or farm vehicles. Any potential USTs at these properties constitute a REC.

Transformers/Polychlorinated Biphenyl (PCB) Items

There are approximately 88 transformers located along the study corridor. Of the 88 transformers, 20 are located on the ground, with five being labeled as non-polychlorinated biphenyl (PCB) and 15 with no label indicating the presence or absence of PCBs. The other 68 transformers were pole-mounted, with 24 being labeled as PCB-free and 44 with no label indicating the presence or absence of PCBs. Any transformers containing PCBs that are adjacent to the action alternatives are a potential REC.

3.18.2 Environmental Consequences

Impacts Specific to No Action Alternative

Under the No Action Alternative, there would be no construction activity or potential release of hazardous materials from fuel and equipment storage during construction. Additionally, the RECs within the study area would not be disturbed because there would be no construction.

Impacts Common to All Action Alternatives

All action alternatives have the potential to cause a release of hazardous materials during construction activities. Hazardous materials that would be brought into the project area and stored or used for construction activities include those identified in Chapter 2 Section 2.4.4. There is the potential for accidental release of these materials into the environment during normal construction activities. The containment of potential accidental releases is provided for by the spill prevention and response procedures identified in Chapter 2 Section 2.4.4.

There is also the potential to release hazardous materials during construction activities that are already present in the project area due to past land use practices. All action alternatives have the potential to impact 10 areas of concern as described below and are shown in Figures 3.18-1 through 3.18-5.

Old Sod Farm

Although no staining or odors were observed around the LUST at this property, it is located adjacent to all action alternatives and any ground disturbance for construction activities has the potential to cause a release and impact the environment. The LUST site is located more than 1,000 feet from US 550; however, the UST investigation findings reported a southwesterly groundwater flow towards the project corridor.

Bodean's Custom Restoration and Collision

Although no environmental concerns have been reported or observed in association with this property, it is possible impacts may have occurred from historic activities or the wastewater lagoon. Since the facility is located adjacent to all action alternatives any ground disturbance for construction activities has the potential to cause a release and impact the environment.

\\S068NTFILE2\GIS\PROJECTS\US_550EA\MAPS\EA_FIG3-18-1_HAZMAT_LTR.MXD

Legend

- Hazardous Material Sites
- Gas Wells
- Existing Right of Way
- Alternatives 1, 2, 3 - Limits of Disturbance
- Alternative 2 - Limits of Disturbance
- Alternatives 3 - Limits of Disturbance

1,000 500 0 1,000 2,000 Feet

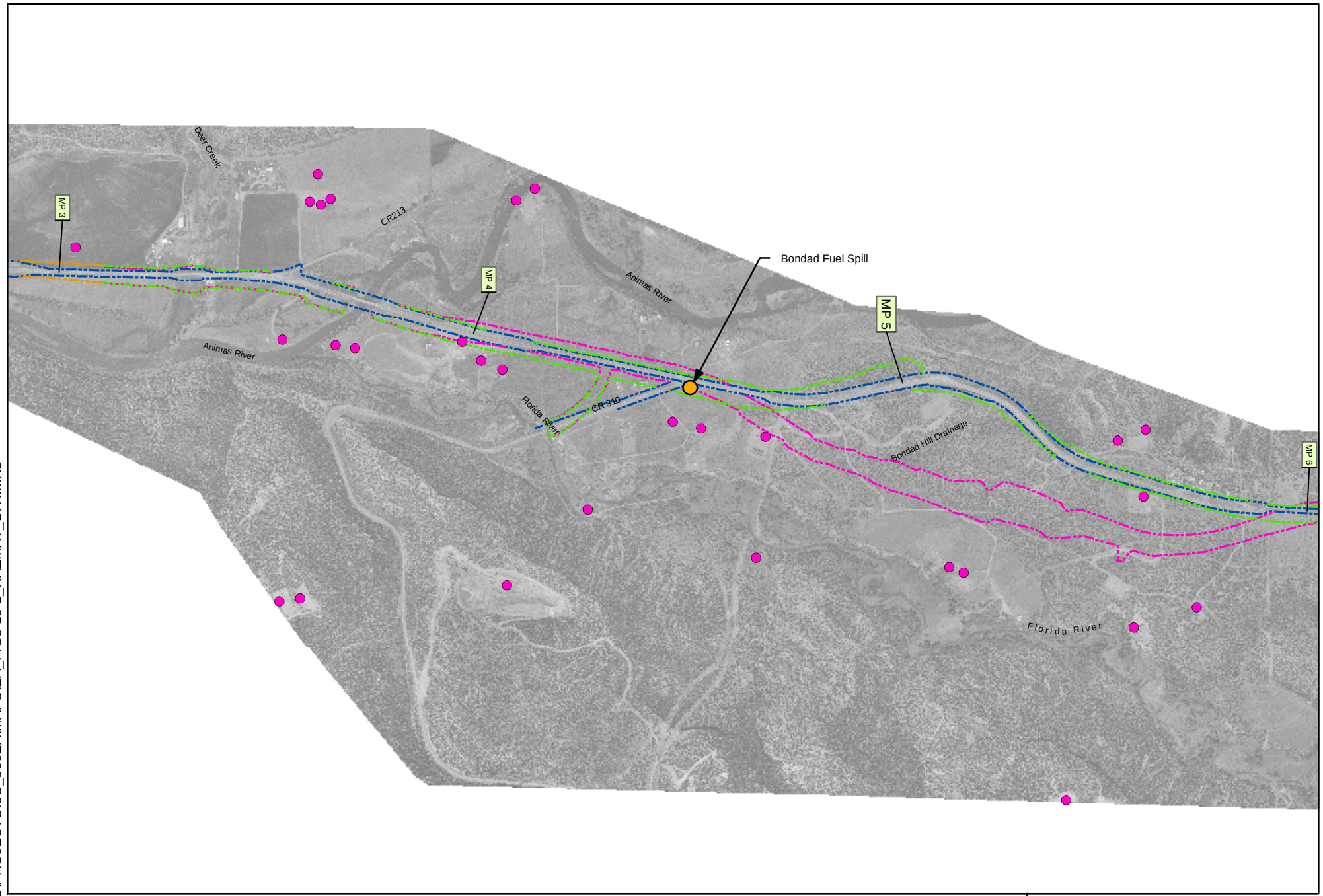
US 550 EA

Hazardous Material Sites and Gas Well Locations from MP 0 to MP 2.9

Figure 3.18-1

02/04/05

To and From MP Distances Are Approximate



\\S068NTFILE2\GIS\PROJECTS\US_550EA\MAPS\EA_FIG3-18-1_HAZMAT_LTR.MXD

Legend

- Hazardous Material Sites
- Gas Wells
- Existing Right of Way
- Alternatives 1, 2, 3 - Limits of Disturbance
- Alternative 2 - Limits of Disturbance
- Alternatives 3 - Limits of Disturbance

1,000 500 0 1,000 2,000 Feet

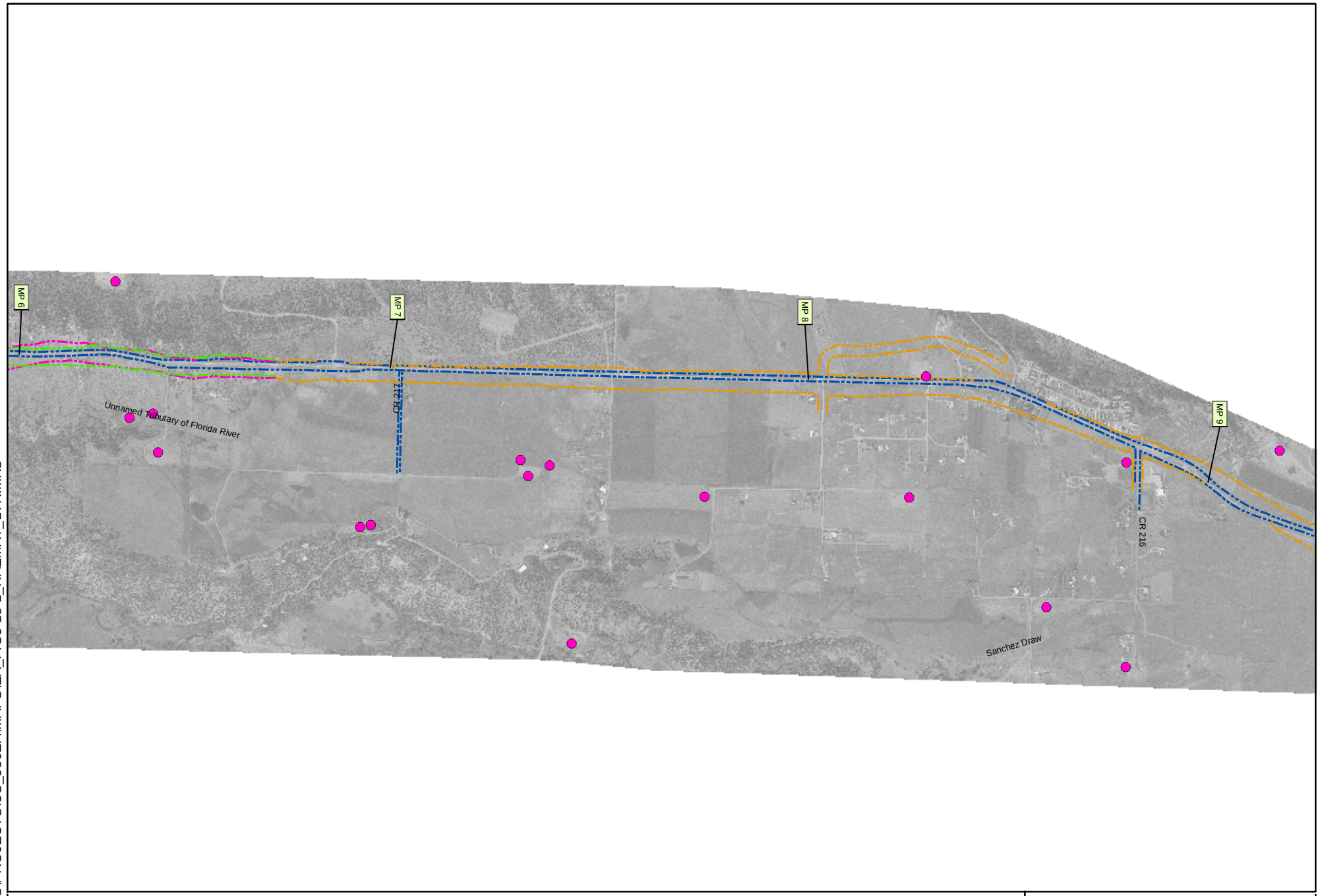
US 550 EA

Hazardous Material Sites and Gas Well Locations from MP 2.9 to MP 6.0

Figure 3.18-2

02/04/05

To and From MP Distances Are Approximate



\\S068NTFILE2\GIS\PROJECTS\US_550EA\MAPS\EA_FIG3-18-1_HAZMAT_LTR.MXD

Legend

- Hazardous Material Sites
- Gas Wells
- Existing Right of Way
- Alternatives 1, 2, 3 - Limits of Disturbance
- Alternative 2 - Limits of Disturbance
- Alternatives 3 - Limits of Disturbance

1,000 500 0 1,000 2,000 Feet

US 550 EA

Hazardous Material Sites and Gas Well Locations from MP 6.0 to MP 9.3

Figure 3.18-3

02/04/05

To and From MP Distances Are Approximate

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Legend

- Hazardous Material Sites
- Gas Wells
- Existing Right of Way
- Alternatives 1, 2, 3 - Limits of Disturbance
- Alternative 2 - Limits of Disturbance
- Alternatives 3 - Limits of Disturbance

1,000 500 0 1,000 2,000 Feet

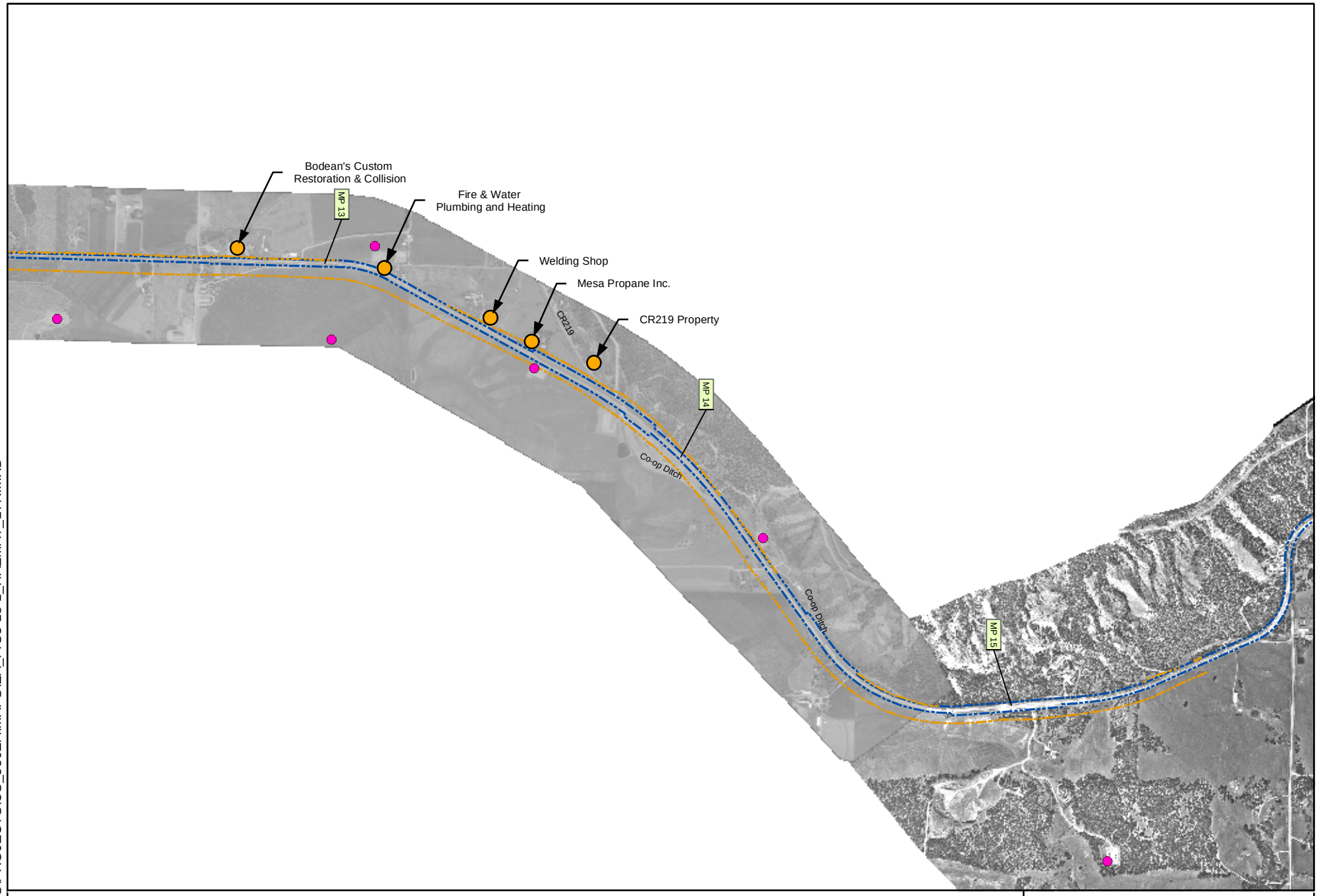
US 550 EA

Hazardous Material Sites and Gas Well Locations from MP 9.3 to MP 12.3

Figure 3.18-4

02/04/05

To and From MP Distances Are Approximate



\\S068NTFILE2\GIS\PROJECTS\US_550EA\MAPS\EA_FIG3-18-1_HAZMAT_LTR.MXD

Legend

- Hazardous Material Sites
- Gas Wells
- Existing Right of Way
- Alternatives 1, 2, 3 - Limits of Disturbance
- Alternative 2 - Limits of Disturbance
- Alternatives 3 - Limits of Disturbance

1,000 500 0 1,000 2,000 Feet

US 550 EA

Hazardous Material Sites and Gas Well Locations from MP 12.3 to MP 15.4

Figure 3.18-5

02/04/05

To and From MP Distances Are Approximate

Fire & Water Plumbing & Heating

Although the UST has been closed and removed, it is possible that unreported leaks or spills may have occurred in the vicinity of the UST. Since the facility is located adjacent to all action alternatives any ground disturbance for construction activities has the potential to impact the environment.

Welding Shop

Although no environmental concerns have been reported or observed associated with this property, it is possible that hazardous materials may exist at this site. The property is located adjacent to all action alternatives. Ground disturbance for construction activities has the potential to cause a release and impact the environment.

Mesa Propane Incorporated

Although no leaks or spills have been reported with this facility's propane tanks, it is possible that unreported leaks or spills exist on or around the property. Since the property is located adjacent to all action alternatives and has been on site for 35 years, ground disturbance for construction activities has the potential to cause a release and impact the environment.

CR 219 Residential Property

This property and catch basins are located adjacent to all action alternatives and ground disturbance during construction activities has the potential to cause a release and impact the environment.

Fuel Spill on Bondad Hill

The Bondad Hill fuel spill is located adjacent to all Action Alternatives and ground disturbance during construction has the potential to cause a release and impact the environment.

Oil and Gas Facilities

Although no observable leaks or odors were observed at the oil and gas facilities, there is the potential for subsurface releases from oil and gas facilities, and associated gathering and transmission pipeline infrastructure, with no observable indications at the surface. Chronic minor leaks that would not be detected by inventory control can result over time in subsurface releases.

Table 3.18-2 presents the oil and gas facilities that have the potential to be impacted by construction activities or staging areas.

Table 3.18-2
Oil and Gas Facilities Potentially Impacted by the Project

Owner	Facility Name	Distance (feet) and direction from US 550	Township, Range, Section
BP America Production Company	Joe A Hotter Gas Unit	170 feet North	T34N R9W Section 17
BP America Production Company	Hotter Gas Unit A 2	200 feet East	T34N R9W Section 17
BP America Production Company	Hotter Gas Unit A1	50 feet East	T34N R9W Section 17
BP America Production Company	Weaselskin Gas Unit 1	250 feet West	T34N R9W Section 19
Williams Production Company	6 Bondad 33-9	280 feet East	T33N R9W Section 7
BP America Production Company	2 Alva Short Gas Unit A	200 feet West	T33N R9W Section 7
BP America Production Company	30-2 Southern Ute 33-9	230 feet East	T33N R9W Section 30
Spatter Nick	Nick Spatter-Bryce Farm 1	250 feet East	T33N R9W Section 31
McKenzie Methane Corporation	Bonds 5-1 WDW	110 feet West	T32N R10W Section 1
Williams Production Company	7 NW Cedar Hills 32-10	215 feet West	T32N R10W Section 12

Three wells are located within the limits of disturbance common to all alternatives.

Underground Storage Tanks

The potential exists for unregistered USTs to be located within the proposed ROW at businesses and residential units. Should USTs exist within the ROW, there is a potential that they may be encountered during construction. An unknown encounter of a UST during construction creates the potential to release hazardous materials into the environment.

Transformers/Polychlorinated Biphenyl Items

Both pole-mounted and ground box transformers are located along the Action Alternative alignments. No impacts are expected from the transformers presence or relocation providing that the transformers have been handled and are moved in an appropriate manner by the utility owner prior to highway construction.

During final design, a field reconnaissance should be conducted to observe surface soil conditions in the vicinity of each transformer where PCB content, past and present, cannot be confirmed. If surface soil staining is observed, it is recommended that surface soils be investigated for the presence of PCBs.

Impacts Specific to Alternative 1

Alternative 1 would not have impacts beyond those discussed as impacts common to all alternatives.

Impacts Specific to Alternative 2 (Preferred Alternative)

Alternative 2 would not have impacts beyond those discussed as impacts common to all alternatives.

Impacts Specific to Alternative 3

Alternative 3 would not have impacts beyond those discussed as impacts common to all alternatives except for oil and gas facilities. Under Alternative 3, four additional oil and gas facilities are located within 300 ft. of the limits of disturbance.

3.18.3 Mitigation Measures (Preferred Alternative)

Issue H-1: Construction activities for the Preferred Alternative could cause a release of hazardous materials into the environment from 10 sites located along the US 550 corridor.

Mitigation Measure H-1: Sampling and further investigation will be completed prior to construction. Further investigation shall be conducted to determine if impacts to the soil and/or groundwater have occurred at the locations discussed in Section 3.18-1. The following sites have been recommended for further investigation and or sampling prior to construction:

- Old Sod Farm
- Bodean's Custom Restoration and Collision
- Fire & Water Plumbing & Heating
- Welding shop
- Mesa Propane Incorporated
- CR 219 residential property
- Fuel Spill on Bondad Hill
- Oil and gas facilities associated gathering and transmission pipeline infrastructure
- Water wells
- Pole-mounted and ground box transformers

If impacts to the soil and/or groundwater have occurred at any of the above locations, CDOT will report the contamination to the appropriate regulatory authority and implement avoidance and/or containment procedures prior to construction to ensure worker safety and avoid a potential release to the environment. Where appropriate, CDOT may further characterize the contamination at a site and remediate it per regulatory requirements.

Effectiveness: Measure H-1 would confirm the absence or presence of potential recognized environmental concerns associated with the above 10 sites. Avoidance, containment, and possible remediation would avoid a potential release to the environment during construction activities.

3.18.4 Residual Adverse Impacts

There should be no consequences from hazardous material sites within the project area. Should mitigation measures for hazardous materials sites be fully implemented, it is not

anticipated that there would be residual adverse impacts. Positive impacts would result from the implementation of mitigation measures.

3.19 CONSTRUCTION

3.19.1 Affected Environment

The US 550 project corridor extends from the New Mexico state line to north to MP 15.4. The project corridor is largely undeveloped with land uses that include rural residential, agriculture and commercial. Numerous wildlife species and vegetative communities native to southwestern Colorado occupy the project area. The project corridor is situated in the San Juan River Basin and intersects one of its primary tributaries, the Animas River, near MP 4. Air quality in the project vicinity currently meets all USEPA requirements under the CAA. Traffic in US 550 is the primary source of noise emissions in the project vicinity, with oil and gas development activities providing a minor contribution.

3.19.2 Environmental Consequences

Impacts Specific to No Action

Construction-related impacts that would occur under the No Action Alternative would be limited to highway maintenance activities and safety improvement projects. Highway maintenance activities may include, but are not limited to, snow and ice removal, sweeping, roadway patching, ditch and culvert maintenance and highway resurfacing. Safety improvements may include intersection reconstruction, shoulder improvements, guardrail installation, and turn-lane construction.

Construction impacts related to the No Action Alternative would be similar to each of the action alternatives, but would generally be shorter term and smaller in magnitude. Impacts would include noise, air emissions, water usage for dust abatement and delays for the traveling public.

As traffic volumes increase along US 550, increased noise, air emissions and traffic delays would result from the increased traffic volume and congestion.

Impacts Common to all Action Alternatives

Each of the action alternatives would result in complete reconstruction of the 15.4-mile US 550 project corridor. Construction activities would include grubbing and clearing, excavation, blasting, bridge abutment and bridge construction, retaining wall construction, construction of drainage structures and wildlife crossings, paving, signing, striping, ROW fence construction and utility relocation. Equipment staging areas, fueling areas, water sources and field offices would be needed during each construction season. Equipment utilized during construction would include excavators, scrapers, hauling trucks, water trucks, paving equipment, and cranes.

Exhaust and particulate (dust) emissions would increase during project construction as a result of construction vehicle activity, lower traffic speed, and earth excavation activities associated with construction. Air emissions would generally be comprised of partially-

spent hydrocarbons, carbon monoxide, nitrous oxides and particulate matter ("Emission Standards Reference Guide for Heavy-duty and Nonroad Engines", USEPA420-F-97-014, September 1997).

A water source would be necessary for dust control activities. Since the water required for dust abatement would likely be approximately 10,000 to 40,000 gallons per day, the water source must be reliable. To ensure depletion of groundwater or surface water sources does not occur, the source must be compliant with Colorado water regulations and rules.

A stormwater management plan would be implemented to protect waterways from construction related impacts from stormwater runoff, erosion and sedimentation.

The equipment staging and bulk fuel storage areas must be compliant with the Colorado Petroleum Storage Tank Regulations (7 C.C.R.1101-14) requirements, which may include security, secondary containment, pressure relief, and a spill prevention control and countermeasure plan.

Detours and traffic delays may discourage local and recreational traffic from using this route, thus impacting local roadways used as alternate routes and businesses that rely on US 550 as a source of customers. Businesses and residences would retain access to their properties at all times during construction; however, access to businesses may be judged as inconvenient at times, which may temporarily impact some businesses. Construction delays may also encourage motorists to use alternate routes. Depending on the location of the construction, motorists may use county roads as alternate routes, thereby increasing the normal traffic volumes on the county roads and accelerating roadway deterioration of these alternate routes. During construction, emergency service providers (police, fire etc.) may also experience delays in response times.

Temporary construction noise impacts associated with excavation, blasting and hauling materials are expected. The increased noise generated by construction equipment would only last for the duration of the construction phase. During that time, the magnitude of noise increase could be considerable, but because the increased noise would occur in the short term, the increase would be considered a nuisance rather than a substantial adverse impact.

Blasting may be necessary in the Bondad Hill vicinity and would likely cause the greatest noise impacts. Although the noise from blasting would be temporarily unpleasant, it would not be substantial in the long term. Blasting would impact four major target groups: large game mammals, summer and winter tourists, recreationists, and local residents / businesses.

Impacts Specific to Alternative 1

Alternative 1 would require a fill below Bondad Hill that is larger than the fill required under Alternative 2 and not require under Alternative 3. This fill would require material to be imported from a borrow source elsewhere, contributing to noise and air emissions. Additional water would be needed to abate dust and to achieve compaction of the fill. Construction noise would impact wildlife and residents in the Animas River valley located west of the project. Construction delays would occur since travel on Bondad Hill

would be restricted to one direction at a time and the roadway would be closed entirely during blasting.

Impacts Specific to Alternative 2 (Preferred Alternative)

Alternative 2 would require a fill below Bondad Hill that is smaller than the fill require under Alternative 1 and not required under Alternative 3. This fill would require material to be imported from a borrow source elsewhere, contributing to noise and air emissions. Water would be needed to abate dust and to achieve compaction of the fill. Construction noise would impact wildlife and residents in the Animas River valley located west of the project. Construction delays would occur since travel on Bondad Hill would be restricted to one direction at a time and the roadway would be closed entirely during blasting.

Impacts Specific to Alternative 3

Alternative 3 would result in construction noise and air emission impacts to wildlife and residents in the Florida River valley located east of Bondad Hill.

3.19.3 Mitigation Measures (Preferred Alternative)

All of the procedural and regulatory requirements are described in Section 2.4 *Construction Features Common to All Action Alternatives.* In addition to those requirements the following mitigation actions will be implemented during construction.

Issue C-1: Access to business and residential areas would be impacted during construction.

Mitigation Measure C-1: Temporary signage to business entrances will be provided during construction to draw attention to highway access points.

Issue C-2: Highway users would be impacted by temporary road closures or detours.

Mitigation Measure C-2A: Major traffic disruption will be limited to the off-peak hours as much as possible to alleviate congestion, reduce capacity impacts, and lessen economic impacts.

Mitigation Measure C-2B: Public notices will be provided through newspapers and local signs to warn motorists of future detours and road closures.

Mitigation Measure C-2C: The shortest, most direct detours will be used, with adequate signing to limit additional travel to the extent possible.

Mitigation Measure C-2D: Flaggers will be placed immediately adjacent to work areas to optimize traffic flow during periods of construction activities and to reduce delays.

Mitigation Measure C-2E: Coordinate with emergency service providers and provide a contact system during construction to minimize delays and response times for emergency services.

Effectiveness: The mitigation measures described will minimize construction impacts to businesses, the traveling public, and local residents.

3.19.4 Residual Adverse Impacts

Several residual adverse impacts would occur regardless of the mitigation measures implemented. These impacts include noise and traffic delays. These impacts are considered temporary.

3.20 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Implementation of the proposed action involves a commitment of a range of natural, physical, human, and fiscal resources. Land used in the construction of the proposed facility is considered an irreversible commitment during the time period that the land is used for a highway facility. However, if greater need arises for use of the land or if the highway facility is no longer needed, the land can be converted to another use. At present, there is no reason to believe such a conversion will ever be necessary or desirable.

Considerable amounts of fossil fuels, labor and highway construction materials, such as cement, aggregate, and bituminous material are expended. Additionally, large amounts of labor and natural resources are used in the fabrication and preparation of construction materials. These materials are generally not retrievable. However, they are not in short supply and their use will not have an adverse effect upon continued availability of these resources. Any construction will also require a substantial one-time expenditure of both State and Federal funds, which are not retrievable.

The commitment of these resources is based on the concept that residents in the immediate area, state, and region will benefit by the improved quality of the transportation system. These benefits will consist of improved accessibility and safety, savings in time, and greater availability of quality services which are anticipated to outweigh the commitment of these resources.

3.21 THE RELATIONSHIP BETWEEN SHORT TERM USES OF THE ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG TERM PRODUCTIVITY

Transportation improvements are based on state and local comprehensive planning which considers the future traffic growth within the context of future land use development. The local short-term impacts and uses of the resources by the Preferred Alternative are consistent with the maintenance and enhancement of long-term productivity for the local area and the region.

All action alternatives would have similar short-term impacts, or uses of the environment. Local short-term uses of the environment would include:

- Increased noise, dust and visual degradation during construction;
- Relocation of 12 homes and 3 businesses;
- Loss of soil due to erosion during construction;
- Temporary degradation of water quality due to bridge construction;
- Loss of approximately 2.7 acres of wetlands;

- Changes in visual quality due to a wider roadway template; and
- Some wildlife displacement during construction.

Long-term productivity that would be maintained or enhanced by this action include:

- Improved safety;
- Improved highway capacity;
- Upgraded roadway deficiencies;
- Replacement of wetland values lost; and
- Local economic stimulation.

3.22 SUMMARY OF IMPACTS

Table 3.22-1 summarizes the impacts to each major resource area for the No Action Alternative and all action alternatives. For a more detailed discussion of impacts by resources, consult the individual resource section in Chapter 3.

Table 3.22-1
Summary of Impacts

Resource	No Action Alternative	Impacts Common to All Action Alternatives	Additional impacts due to Alternative 1	Additional impacts due to Alternative 2	Additional impacts due to Alternative 3
Wildlife	0 acre	4.6 acres of native vegetation	50.4 additional acres of native vegetation	55.4 additional acres of native vegetation	73.2 additional acres of native vegetation
Wetlands	0 acre	**2.11 acres total** 0.62 acre jurisdictional 1.49 acres nonjurisdictional	**0.59 additional acre** 0.52 acre jurisdictional 0.07 acre nonjurisdictional	**0.56 additional acre** 0.52 acre jurisdictional 0.04 acre nonjurisdictional	**0.63 additional acre** 0.55 acre jurisdictional 0.08 acre nonjurisdictional
Wetlands: other waters of the US	0 acre	0.25 acre other waters of the US	0.03 additional acre other waters of the US	0.15 additional acre other waters of the US	0.15 additional acre other waters of the US
Threatened, Endangered, and Sensitive Species	0 acre	Bald Eagle – 0.51 acre of habitat Southwestern Willow Flycatcher – 0.15 acre of habitat Gray Vireo – 2.18 acres of habitat Western Burrowing Owl – 0.087 acre of habitat	Bald Eagle – 2.02 additional acres Southwestern Willow Flycatcher – 0.33 additional acre Gray Vireo – 27.04 additional acres	Bald Eagle – 2.05 acres Southwestern Willow Flycatcher – 0.32 additional acre Gray Vireo – 29.3 additional acres	Bald Eagle – 2.07 additional acres Southwestern Willow Flycatcher – 0.32 additional acre Gray Vireo – 49.81 additional acres
Soils and Geology	0 acre	Increased wind and runoff erosion Soil compaction Decreased stability of rock outcrops due to blasting	No additional impacts	No additional impacts	Approximately 16 –20 additional acres more disturbance, which equals greater potential for wind and runoff erosion.
Vegetation	0 acre	**2.48 acres** 2.20 acres Piñon-Juniper 0.19 acre Sagebrush Shrubland 0.09 acre Riparian	**49.82 additional acres** 27.1 acres Piñon-Juniper 20.71 acres Sagebrush Shrubland 2.01 acres Riparian	**54.66 additional acres** 29.3 acres Piñon-Juniper 23.32 acres Sagebrush Shrubland 2.05 acres Riparian	**72.49 additional acres** 49.8 acres Piñon-Juniper 20.61 acres Sagebrush Shrubland 2.08 acres Riparian
Noxious Weeds	0 acre	Potential exists to spread noxious weeds during construction.	No additional impacts	No additional impacts	Approximately 16 to 20 acres more disturbance, increased potential to

Resource	No Action Alternative	Impacts Common to All Action Alternatives	Additional impacts due to Alternative 1	Additional impacts due to Alternative 2	Additional impacts due to Alternative 3
					spread noxious weeds in previously undisturbed area.
Floodplain and Hydrology	No impacts	Upstream bridge would reduce 100-year water surface by more than 15 feet	No additional impacts	No additional impacts	No additional impacts
Floodplain and Hydrology: Water Quality	No impacts	No construction-related impacts to surface water quality, but impacts from continued traffic use and highway maintenance	No additional impacts with use of Best Management Practices (BMPs)	No additional impacts with use of BMPs	No additional impacts with use of BMPs
Air Quality	Potential exceedence of CO standard	No violations of CO or 24-hour PM_{10} standard. Short-term increase in PM_{10} emissions during construction.	No additional impacts	No additional impacts	Increased short-term fugitive dust emissions due to additional 16 to 20 acres of disturbance.
Paleontology	None	Slight potential but none identified	No additional impacts	No additional impacts	Increased potential due to 16 to 20 acres more disturbance
Land Use: Residential	No changes to land use	8 residential relocations 77 acres impacted residential land use without relocation 33 residential accesses changed	4 additional residential relocations 17 additional acres impacted of residential land use without relocation 21 additional residential accesses changed	Same as Alternative 1	2 additional residential relocations 24 additional acres impacted residential land use without relocation 23 additional residential accesses changed
Land Use: Business	No changes to land use	2 business relocations 4 acres impacted commercial land use 4 business accesses changed	1 additional business relocations 2 additional acres impacted commercial land use 4 additional business accesses changed	Same as Alternative 1	1 additional business relocations 1 additional acres impacted commercial land use 3 additional business accesses changed

Resource	No Action Alternative	Impacts Common to All Action Alternatives	Additional impacts due to Alternative 1	Additional impacts due to Alternative 2	Additional impacts due to Alternative 3
Land Use: Vacant	No changes to land use	0.11 acre of vacant land	20 additional acres of vacant land	19 additional acres of vacant land	37 additional acres of vacant land
Land Use: Tribal	No changes to land use	6 acres of Tribal land	3 additional acres of Tribal land	4 additional acres of Tribal land	18 additional acres of Tribal land
Farmland	0 acre	14.74 acres Prime Farmland 64.18 acres Statewide Important Farmland	14.6 additional acres Prime Farmland 4.10 additional acres Statewide Important Farmland	14.6 additional acres Prime Farmland 4.2 additional acres Statewide Important Farmland	27.0 additional acres Prime Farmland 4.3 additional acres Statewide Important Farmland
Socioeconomics	No Impact	Access changes and/or restrictions 8 residential relocations 2 business relocations	Access changes and/or restrictions 4 additional residential relocations 1 additional business relocation	Same as Alternative 1	Access changes and/or restrictions 2 additional residential relocations 1 additional business relocation
Environmental Justice	No impact	No disproportionate impact to any Environmental Justice populations	None	None	None
Noise	20 homes currently above 66 dBA with 9 more above 66 dBA in 2025	6 homes exceed 66 dBA Short-term Construction noise	3 additional homes exceed 66 dBA	Same as Alternative 1	2 additional homes exceed 66 dBA
Visual Resources	None	Change from rural landscape to major highway corridor	Rock cuts and retaining walls on Bondad Hill	Same as Alternative 1	New alignment through previously undisturbed area near Bondad Hill.
Historic and Archeological Preservation	None	2 NRHP eligible archaeological sites 2 non-eligible sites, included at the request of SUIT.	No additional impacts	No additional impacts	One additional National Register eligible archaeological site.
Hazardous Materials	No sites of concern impacted	Impacts to 10 areas of concern	No additional impacts	No additional impacts	No additional impacts

3.23 SUMMARY OF MITIGATION MEASURES, BMPS AND DESIGN COMMITMENTS

Table 3.23-1 summarizes the mitigation measures required by NEPA and the BMPs and design features that may be implemented to reduce the number, type, and/or severity of impacts resulting from the action alternatives. Potential mitigation measures may change as a result of public comment on review of the EA. Mitigation strategies would be refined during final design.

Table 3.23-1
Summary of Mitigation Measures, BMPs and Design Commitments

Resource	Issue	Mitigation Measure	Effectiveness	Summary of BMPS and Design Commitments
Terrestrial Wildlife	Mortality to small and medium-sized terrestrial wildlife from vehicle collisions is expected along with long-term habitat fragmentation and population losses from highway widening.	In addition to the large wildlife crossings that will be installed as part of the Preferred Alternative, CDOT will install smaller wildlife crossings utilizing the following guidelines for small and medium-sized wildlife species: • Install smaller-sized culverts spaced every 500 to 1,000 feet to increase habitat connectivity and access across US 550 for small- and medium-sized mammals, such as rodents, lagomorphs, coyotes, weasels, and foxes. These crossings will be constructed of small concrete box or pipe culverts (ranging from 3.3 to 4.95 feet in diameter) and will be placed in areas with vegetative cover, including uplands with herbaceous cover and drainages. These culverts will be partially buried to accommodate a natural substrate floor. Exact locations of these smaller culverts will be determined in consultation with CDOW as part of final design. • Place approximately 1-foot of vegetative debris such as old stumps, logs, and brush inside (along one edge of the bottom) of the four large crossing structures as	Mitigation measures would reduce impacts to wildlife from mortality from vehicle collisions and would prevent long-term habitat fragmentation and population losses from highway widening.	• Four large wildlife crossings and deer fencing will be installed as part of the Preferred Alternative. The large crossing structures will have minimum dimensions of 8 feet high by 24 feet wide.

Resource	Issue	Mitigation Measure	Effectiveness	Summary of BMPS and Design Commitments
		cover for small mammals and amphibians. • Deer and elk migration patterns and associated locations of high crossing frequency may change in response to future growth and development within the US 550 corridor. Therefore, specific locations for the large wildlife crossings will be reanalyzed and specific locations for crossing structures decided prior to final highway design. The continued recording of collision locations along US 550 will provide increasingly accurate data on where deer are crossing the highway. • The large wildlife crossing structures will require monitoring for three years post-construction to determine effectiveness. Monitoring will include continued collection of deer-vehicle collision data along US 550, as well as track surveys or motion-activated cameras within the structures.		
Birds	Vegetation clearing, earth-moving, and other construction activities have the potential to alter breeding behavior and destroy nests of bird species protected under the	Vegetation removal activities will be timed to the extent possible to avoid the migratory bird breeding season (April 1 through August 15). Areas that must be scheduled to have vegetation removed between April 1 and August 15 shall be surveyed for	The proposed mitigation for birds would eliminate impacts to nesting individuals as no active nests would be disturbed or removed during construction. No new nests would be	To facilitate compliance with the Migratory Bird Treaty Act (MBTA), vegetation removal and demolition or structural work on existing bridges will be timed to the extent

Resource	Issue	Mitigation Measure	Effectiveness	Summary of BMPS and Design Commitments
	MBTA, including raptors. Destruction or disturbance of nests that results in loss of eggs or young is a violation of the MBTA.	nests and cleared by a qualified biologist prior to the initiation of work, and a migratory bird nest depredation permit under the MBTA shall be obtained (if necessary), or appropriate inactive nest removal and hazing/exclusion measures shall be incorporated into the work to avoid the need to disturb active migratory bird nests. Complete raptor nest surveys prior to start of construction in order to identify active nests and potential areas where seasonal restrictions on construction may be required. If nests are located in the study area, protective buffer zones will be established around active nests during construction to avoid disturbance to individual birds while nesting. Individual raptor perch trees removed in the ROW will be replaced at a 2:1 ratio, or as specified by state and federal wildlife agencies, to ensure raptor perch trees are replaced. Perch poles will be placed at a 1:1 ratio for raptor perch trees to mitigate for the loss of perching opportunities until replacement perch trees mature. Any demolition or structural work on existing bridge structures (such as the Animas Bridge) may potentially destroy or disturb swallows nesting on the underside of the bridge.	destroyed as land-clearing would occur during non-breeding seasons. Perching opportunities for raptors would be effectively mitigated by the placement of perch poles and replacement of perch trees. Wintering or migrating individuals would be temporarily displaced from construction.	possible to avoid the migratory bird breeding season (April 1 through August 15). Areas that must be scheduled to have vegetation removed or work completed on existing bridges between April 1 and August 15 shall be surveyed for nests and cleared by a qualified biologist prior to the initiation of work, and a migratory bird nest depredation permit under the MBTA shall be obtained (if necessary), or appropriate inactive nest removal and hazing/exclusion measures shall be incorporated into the work to avoid the need for a depredation permit.

Resource	Issue	Mitigation Measure	Effectiveness	Summary of BMPS and Design Commitments
		Demolition or structural work on existing bridge structures will be scheduled to the extent possible between August 16 and March 31 to avoid impacts to nesting swallows. If bridge work must begin after April 1, nest surveys will be conducted prior to April 1 to determine if inactive nests are present. Appropriate hazing/exclusion measures or inactive nest removal will be used prior to the nesting season if nests are present to ensure that no active nests are disturbed during demolition and construction activities.		
Wetlands	The Preferred Alternative would permanently impact 2.67 acres of wetlands and 0.28 acre of other waters, including 1.14 acres of jurisdictional wetlands.	Unavoidable permanent impacts will be mitigated through on-site and/or off-site wetland creation or restoration, in accordance with CDOT policy, current Federal Highway Administration (FHWA) wetland mitigation policy (23 CFR 777), current Corps mitigation policies, and the conditions of the Corps Section 404 Permit. Although the CWA only requires compensatory mitigation for those wetlands and other waters considered jurisdictional by the Corps, it is CDOT policy to mitigate all wetlands impacts (jurisdictional and nonjurisdictional) at a 1:1 ratio. Based on a functional assessment methodology, the Corps will determine the appropriate level of mitigation based upon the functions	The compensatory mitigation would replace the area and functions of wetlands impacted by the project, and would also replace impacted riparian habitat.	Wetland and riparian areas shall be protected from construction equipment and unpermitted fills by installing temporary orange construction fencing as directed by the Engineer. Construction fencing shall be removed upon project completion. No unpermitted temporary or permanent fills within wetland areas are allowed under the Contract. Existing trees, shrubs, bushes, grass, or wetland areas outside the designated work area but inside the project limits,

Resource	Issue	Mitigation Measure	Effectiveness	Summary of BMPS and Design Commitments
		lost or adversely affected as a result of impacts to aquatic resources. The overall goals of compensatory mitigation will be to replace the acreage of wetlands that will be permanently impacted by the project, to replace the wetland functions that will be lost. In addition, mitigation will follow an ecosystem approach and include a mix of habitats, and will be within the same watershed as the impacted wetlands. Mitigation for non-wetland waters of the United States and for riparian habitat will be included. Five new, potential, on-site wetland mitigation areas have been identified. One of them (Animas River Terrace) is relatively large and can be used to mitigate all of the project impacts, if necessary, and also provides a location for riparian habitat mitigation. The other four sites are smaller and address specific impacts. All of the potential mitigation areas are in upland or primarily upland areas, and wetland mitigation will primarily consist of wetland creation. Final selection of sites and construction methods will depend on various factors such as the areas required, land availability, hydrology, engineering feasibility, wetland functions that can be achieved, and the surrounding habitats and relative importance in the		that are damaged due to the Contractor's operations, shall be replaced in kind at the Contractor's expense.

Resource	Issue	Mitigation Measure	Effectiveness	Summary of BMPS and Design Commitments
		ecological landscape. CDOT will obtain easements or other legal protection of the selected mitigation areas.		
Bald Eagle	The project is expected to have limited adverse effects on bald eagles wintering or nesting within 0.5-mile of the study area due to construction activities causing increased stress during wintering and nesting periods. Removal of mature riparian trees for roadway widening and construction of the Animas River Bridge would reduce the number of roosting opportunities for bald eagles along the Animas River and the loss of 0.087 acre of Gunnison's prairie dog habitat would reduce foraging opportunities within the study area. Additionally, destruction or disturbance of bald or golden eagle nests or eggs is a violation of the Bald and Golden Eagle Protection Act of 1940 (As amended) 16 USCA 668	Raptor nest surveys will be conducted within 0.5 mile of the construction area prior to starting construction of specific highway segments. If an active or inactive bald eagle nest is identified, a 0.5-mile buffer will be required around the nest, and seasonal restrictions (November 15 to July 31) of no human encroachment will occur within the 0.5-mile radius of the nest. Surveys for nocturnal bald eagle roosts will be conducted prior to starting construction. If a roost is identified, restrict construction activity within 0.25 mile of active nocturnal roost sites between November 15 and March 15. Cottonwood (*Populus* sp.) and other riparian woodland trees removed by construction activities will be replaced at a 2:1 ratio with an appropriate tree species, such as cottonwood (*Populus* sp.).	The proposed mitigation measures plus the addition of perch poles listed as mitigation for all birds (Section 3.2.3) should be effective in preventing adverse effects to key habitat features (if they are found to occur) and should prevent nest abandonment, or disturbance of wintering bald eagles nesting within 0.5-mile of the study area.	

Resource	Issue	Mitigation Measure	Effectiveness	Summary of BMPS and Design Commitments
Burrowing Owl	Should burrowing owls be present in the construction area, there is a potential for loss of nests and mortality of eggs and young.	Surveys for nesting burrowing owls will be conducted annually and prior to construction between May 1 and July 31 to determine presence or absence in the study area. If burrowing owls are determined to be present in the study area, implement seasonal restrictions will be implemented on construction activities from April 15 through July 15 to avoid impacts to nesting birds. A 225-foot buffer will be required around active nest areas (Craig 2001b).	The proposed mitigation measure will prevent loss of nests and mortality of eggs and young.	
Southwestern Willow Flycatcher	The potential exists for disturbance of breeding Southwestern willow flycatchers and loss of their eggs or young if willow patches are removed during the breeding season. Removal of willow patches suitable for nesting would reduce nesting opportunities.	To confirm that no southwestern willow flycatchers are nesting in the study area, additional presence/absence surveys will be conducted one breeding season prior to construction following the most recent survey protocol provided by USFWS. The current USFWS protocol requires presence/absence surveys of willow patches that are 30 feet in diameter and 6 feet high, within 0.25 mile of ROW. These surveys	The proposed mitigation measure would prevent loss of individual southwestern willow flycatcher and disturbance to eggs and young during construction. Loss of willow patches suitable for nesting would reduce nesting opportunities along the Animas River.	

Resource	Issue	Mitigation Measure	Effectiveness	Summary of BMPS and Design Commitments
		will be conducted during the bird's breeding season, between May 1 and August 15. Buffers will be required during construction around active nest areas or within 0.25 mile of an occupied willow patch (Powell 2003). Willow patches located within the ROW that have potential for supporting breeding southwestern willow flycatchers (those 30 feet in width, length and in height) will be removed before or after the breeding season (i.e., prior to May 1 and after August 15).		
Knowlton Cactus	Although no Knowlton cactus are known to currently exist within the ROW, suitable habitat exists and there is the potential for Knowlton cactus to be destroyed by the project because construction may not proceed for several growing seasons.	Preconstruction presence/absence surveys will be conducted in piñon-juniper and sagebrush habitats between late April and early May. If Knowlton cactus is found within areas scheduled to be impacted, CDOT will consult with USFWS to develop measures to avoid, take, and/or transplant any Knowlton cactus individuals identified.	The proposed mitigation measure would identify Knowlton cactus located within the project area so necessary avoidance and/or mitigation techniques can be implemented to promote the survival of the species.	
Gray Vireo	During construction the potential for losses of active gray vireo nests exists.	Piñon -juniper vegetation in the ROW will be cleared prior to April 1 to prevent gray vireo (and other birds) from nesting within the ROW and avoid take of or disturbance to active nests during breeding season.	Clearing piñon -juniper vegetation prior to April 1 would prevent gray vireo from nesting within the ROW prior to construction and avoid impacts to gray vireo nests.	To facilitate compliance with the Migratory Bird Treaty Act (MBTA), vegetation removal and demolition or will be timed to the extent possible to avoid the gray vireo breeding season (April 1 through August

Resource	Issue	Mitigation Measure	Effectiveness	Summary of BMPS and Design Commitments
				15). Areas that must be scheduled to have vegetation removed between April 1 and August 15 shall be surveyed for nests and cleared by a qualified biologist prior to the initiation of work, and a migratory bird nest depredation permit under the MBTA shall be obtained (if necessary), or appropriate inactive nest removal and hazing/exclusion measures shall be incorporated into the work to avoid the need for a depredation permit.
Roundtail Chub	During construction of the Animas River Bridge roundtail chubs would be disturbed and adversely impacted by a decrease in water quality caused by an increased sediment load downstream from the construction area.	Construction activities in the Animas River will take place only during low flows (July to October). If flowing water is present, it will be diverted around active construction areas.	The proposed mitigation measures would minimize impacts to the roundtail chub during construction. In addition, stormwater BMPs used during construction (which are required by the Clean Water Act and CDOT's Stormwater Management Plan) would reduce the potential for downstream impacts to fish from sedimentation and erosion.	

Resource	Issue	Mitigation Measure	Effectiveness	Summary of BMPS and Design Commitments
Sensitive Plant Species	Clearing, grading, and other earth-moving activities have the potential to destroy sensitive plant species located within the construction zone. These species include: Abajo penstemon, Missouri milkvetch, Pagosa phlox, San Rafael milkvetch, Philadelphia fleabance, and wood lily.	Prior to construction, presence/absence field surveys will be conducted during the flowering season in habitats potentially containing sensitive plants that will be impacted by ROW construction. Soil seed beds of populations that cannot be avoided by construction activities will be transplanted to areas of appropriate soils and vegetation.	The proposed mitigation measures for sensitive plant species would minimize impacts to individuals and populations of sensitive plant species present within the construction area.	
Soils and Geology	Construction activities would cause increased wind and runoff-related soil erosion due to the loss of vegetation cover in construction areas.	In addition to the temporary stormwater BMPs that will be installed during construction as part of CDOT's mandatory stormwater permit (Section 2.4.5 Stormwater Management), permanent engineering controls to limit soil erosion will be installed as early in the project as possible and remain after project completion. Permanent engineering controls will include using soil berms (check dams), water bars on soil slopes steeper than 3:1, and sediment basins. Additionally, reclamation activities (mulching and reseeding disturbed areas) will take place within 20 days of completion of construction activities.	The proposed mitigation measures for soils and geology would reduce wind and runoff-related soil erosion both during construction activities and post-construction	
	Construction activities would cause soil compaction that impairs	Topsoil will be stripped and stored separately during construction activities. Topsoil will be placed on	The proposed mitigation measures for soils and geology would decrease soil	

Resource	Issue	Mitigation Measure	Effectiveness	Summary of BMPS and Design Commitments
	soil function.	areas to be reclaimed just prior to mulching and reseeding to minimize compaction from construction equipment.	compaction and preserve soil function in areas that would be reclaimed.	
	Blasting for roadway widening in the Bondad Hill area would decrease the stability of rock outcrops.	Rock fall mesh, rock bolts, and other engineering controls will be incorporated in the final rock cut design to increase slope stability.	The proposed mitigation measures would increase slope stability in areas where blasting rock outcrops is required.	
Vegetation	Loss of riparian vegetation and potential long-term loss of habitat values, due to roadway construction.	The construction ROW will be fenced where it passes through riparian vegetation to prevent temporary disturbance outside the construction limits. Construction staging areas will not be placed in riparian areas. All disturbed areas within riparian areas not occupied by permanent facilities will be revegetated with appropriate native species. Riparian areas disturbed during construction will be stabilized as soon as possible. In riparian areas, trees removed during construction will be replaced at a 1:1 ratio based on a stem count of all trees with a diameter at breast height of 2 inches or greater. Riparian shrubs will be replaced based on their preconstruction aerial coverage. All replacement trees and shrubs will be native species.	The proposed mitigation measures would reduce the area of direct disturbance to riparian areas, and would restore 0.65 acres of riparian vegetation temporarily impacted by construction activities. However, complete restoration of riparian areas temporarily impacted by construction activities may take 10-50 years.	
	Potential long-term loss of other native vegetation communities.	Abandoned and reclaimed road and ROW will be revegetated with native vegetation. Revegetation will include	The proposed mitigation measures would restore native vegetation on 31 acres	

Resource	Issue	Mitigation Measure	Effectiveness	Summary of BMPS and Design Commitments
		planting or seeding of piñons and junipers where bordered by piñon-juniper woodland, and sagebrush where bordered by sagebrush shrubland.	where the existing roadway would be abandoned. However, complete restoration of piñon and juniper woodlands may take up to 50 years.	
Noxious Weeds	Mobilizing construction vehicles, excavating and moving borrow materials and topsoil, land clearing, and reclamation may bring noxious weeds or introduce new noxious weeds into the project area.	Monthly noxious weed surveys will take place during the growing season to identify and treat noxious weeds. Contractors' vehicles will be washed before being brought onto the project site to ensure that they are free of soil and debris capable of transporting noxious weed seeds or roots from other areas. Disturbed areas will be reclaimed. Certified weed-free mulch will be used for reclamation, and weed-free straw bales will be used for sediment barriers during construction. Topsoil sources used in reclamation will be examined for noxious weeds prior to being brought on site.	The proposed mitigation measures for noxious weeds would limit the spread of existing noxious weeds and reduce the likelihood of introducing new noxious weeds into the project area.	
	New weed infestations may occur after the project is completed. Noxious weeds that establish in construction areas and along the road ROW may spread into adjacent lands, resulting in degradation of habitat quality in riparian	Post-construction monitoring will be used to identify new weed infestations and to evaluate the effectiveness of weed control methods. Monitoring and weed controls will be implemented for 3 years after construction.	The proposed post-construction monitoring and weed control would prevent new weed infestations from getting established after construction activities are completed.	

Resource	Issue	Mitigation Measure	Effectiveness	Summary of BMPS and Design Commitments
	areas and other natural habitats.			
Water Resources		Due to the temporary BMPs that will be installed during construction, and the permanent BMPs that will be installed as part of the Preferred Alternative project design to remove 80% of the average annual TSS loading from the average storm (see Section 2.3.2.1 *Design Features Common to All Action Alternatives)*, no additional mitigation is required.		The project work shall be performed using practices that minimize water pollution during construction as detailed in Section 107.25 and 208 of CDOT's Standard Specifications for Road and Bridge Construction. The measures shall include, but not be limited to, erosion control measures during the life of the project to prevent or minimize erosion, sedimentation, and pollution of state waters. Bridge rail work, bridge deck work, and concrete washing and treatment work shall be conducted in a manner that prevents washwater and other potential pollutants, including concrete and sandblasting debris, from entering state waters. Potential pollutants shall be contained and disposed of in accordance with applicable state and federal waste disposal requirements.

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				Stormwater: In addition to the installing permanent Best Management Practices (BMPs) as part of the project design, Section 402 of the Clean Water Act (CWA) requires that CDOT install construction BMPs for the purposes of: 1. Controlling and minimizing erosion and sedimentation during the construction phase of a project; and 2. Reducing pollutants in stormwater runoff and receiving waters during construction. CDOT will comply with this requirement and will prepare a plan for design and implementation of construction BMPs to be used on the project. This plan is referred to as a Stormwater Management Plan (SWMP). The plan will be prepared prior to the start of construction. As required by the SWMP, CDOT will monitor the construction BMPs before, during, and

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				after construction of the project to measure their effectiveness. A more comprehensive description of construction BMPs for stormwater and erosion control is contained in the CDOT manual, *Erosion Control and Stormwater Quality Guide* (CDOT 2002a).
Air Quality	Increased particulate emissions during construction activities may cause temporary localized visibility impacts.	Watering or other fugitive dust control methods will be employed to reduce fugitive dust. Additionally, construction staging areas will be located at least 200 meters from the nearest residence or business.	The proposed mitigation measures for air quality would reduce particulate emissions approximately 25-50 percent during construction activities and locate fugitive dust sources at a distance from receptors sufficient to decrease the likelihood of localized impacts from fugitive dust (CDPHE Air Division).	
Paleontology	Paleontological resources may be impacted by excavation activities although none were found during field visits.	If paleontological resources are uncovered during the construction of the Preferred Alternative, construction operations in the area of the discovery shall cease and the CDOT staff paleontologist will be notified to assess their scientific importance. If the paleontological resources are	The proposed mitigation measures would assist in the minimization of significant impacts to important paleontological resources that may be encountered during construction.	

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		found to be scientifically important, avoidance and collection procedures will be established prior to reinitiating construction activities in the area.		
Land Use	Under the Preferred Alternative, 3 small businesses and 12 residential units would require relocation.	The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), as amended by the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17) (Uniform Act) requires that a property owner be notified of CDOT's interest in acquiring his or her property before a real property appraisal is completed. If an appraisal is conducted, each property owner shall be given the opportunity to accompany the appraiser during the inspection of his or her property. CDOT must then establish just compensation based on a current appraisal. The owner of real property acquired for ROW will be compensated at market value, in accordance with the Uniform Act, state statutes, and CDOT policies and procedures. No owner shall be required to surrender possession of the real property until paid the agreed purchase price or the amount deemed to be just compensation has been deposited with the court for the benefit of the owner. If the impacts described in this EA cannot be avoided during final design,	The relocation assistance described would minimize the disruption of moving and maximize the likelihood of successful relocations.	

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		acquisition and relocation will be conducted in accordance with will the Uniform Act. CDOT and FHWA will provide relocation assistance and payment for residential, businesses, farms, and nonprofit organizations displaced persons without discrimination. When applicable, all qualified relocatees shall receive monetary payments, which may include payments for moving expenses, business in lieu of payment, rent supplements, down payments, and increased interest payments.		
Farmland	The Preferred Alternative would impact approximately 29.3 total acres of Prime Farmland.	To limit impacts to Prime Farmland, the amount of land acquired for highway improvements will be limited to only the portions of parcels actually needed for the ROW instead of the entire parcel.	The proposed mitigation measure would reduce permanent impacts to Prime Farmlands to approximately 26 acres total.	
	Two agricultural properties irrigated with a center-pivot irrigation system would be impacted by all the action alternatives, including the Preferred Alternative.	CDOT will coordinate with affected landowners and relocate irrigation systems to the extent practical to promote ongoing agricultural uses of Prime Farmland and Statewide Important Farmland within the project area. If the current system cannot be modified, the irrigation system may be replaced with another type of system.	As a result, there would be no impact to irrigation systems in the project area.	
Socioeconomics		None - See Section 2.4, *Construction Features Common to All Action Alternatives*.		

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EJ		Due to the pedestrian bridge or underpass that will be provided between Old Homestead Mobile Home Park and Sunnyside Elementary School, and the noise wall that will be constructed as part of the design for the Preferred Alternative (see Section 2.3.2.1*Design Features Common to All Action Alternatives)*, no additional mitigation is required.		
Noise	Five isolated homes and 13 homes within the mobile home park would experience operational noise levels exceeding NAC B noise threshold limits.	A wall length of 1,800 feet long and 8 feet high is considered reasonable for noise mitigation at the Mobile Home Park and noise mitigation is recommended. The affected owners will be contacted to confirm their desire for noise mitigation during the design phase of this project.		
	Construction noise would cause a temporary disturbance to local residents. Construction would generate noise from diesel-powered earth-moving equipment such as dump trucks and bulldozers, back-up alarms on certain equipment, compressors, and pile drivers. Construction noise at off-site receptor locations will usually be dependent on the loudest one or two pieces of equipment operating at the	Construction noise impacts, while temporary, will be mitigated where reasonable, by limiting work to daylight hours, requiring the contractor to use well-maintained equipment (especially with respect to mufflers), and through the use of additional measures such as temporary noise barriers where applicable.	The proposed mitigation measures for noise would provide operational noise levels below existing conditions for the 13 impacted homes within the mobile home park and effectively reduce construction noise levels.	

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	moment. Noise levels from diesel-powered equipment ranges from 80 to 95 dBA at a distance of 50 feet. Impact equipment, such as rock drills and pile drivers can generate higher noise levels.			
Visual	Additional excavation and cuts and fills required for construction of the Preferred Alternative in the Bondad Hill area would create a visual impact by increasing the topographic and color contrast between the highway and the surrounding landscape.	The required cut line will be blended into the existing terrain to reduce the topographic contrast between cut slopes and the surrounding landscape. • To reduce the color contrast between fill slopes and the surrounding landscape, excess waste material excavated during construction will not be downcast on the downhill slope. • Retaining walls for cut and fill slopes will be consistent with the general design of the retaining walls used in areas along US 550 just north of the New Mexico state line. The color of the retaining wall will be selected to reduce color contrasts with the surrounding vegetation.	The proposed mitigation measures for visual resources would decrease the contrast between construction and the surrounding landscape.	Colors, architectural treatments, and finishes used for overpasses and underpasses, retaining walls, sound walls, highway guardrails, lighting and signage will be consistent throughout the project corridor so that the visual impact of the roadway and surrounding landscape is minimized.
	The removal of roadside vegetation increases the visual impact of the roadway by increasing the contrast between construction areas and the	Removal of adjacent roadside vegetation will be minimized, where possible. In areas that will lose vegetation that currently provides an important visual screen, revegetation during reclamation will include taller	The proposed mitigation measure for visual resources would decrease the contrast between construction areas and the surrounding	

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	surrounding landscape.	plant species (trees and shrubs) that can serve the same function.	landscape.	
Historic and Archaeological Preservation	CDOT has determined that the Preferred Alternative would have an adverse effect on site 5LP 6665. Both the SHPO and SUIT have concurred with this assessment.	Mitigation of adverse effects to 5LP6665 can be most effectively accomplished through large-scale controlled archaeological excavations, as the importance of this site lies chiefly in what can be learned by data recovery. The parameters of these mitigation efforts will be outlined in a Memorandum of Agreement (MOA) prepared by CDOT, and executed by FHWA, CDOT and SUIT, in consultation with ACHP.	Data recovery excavations at 5LP6665 would preclude the loss of important archaeological information as a result of construction.	When the Contractor's operations, including materials pits and quarries, encounter plant or animal fossils, remains of prehistoric or historic artifacts (bottle dumps, charcoal from subsurface hearths, old pottery potsherds, stone tools, arrowheads, etc.), the Contractor's affected operations shall immediately cease. The Contractor shall immediately notify the Engineer, or other appropriate agency for contractor source pits or quarries, of the discovery of these materials. The contractor's operations may continue only after the appropriate agencies are notified and the contractor is allowed to proceed.
	Impacts to non-NRHP eligible sites 5LP2616 and 5LP6456 on SUIT lands.	Monitoring by a qualified archaeologist and/or a SUIT tribal member will be required during construction to ascertain the extent of impacts, if any, to 5LP2616 and 5LP6456. If such monitoring	Monitoring would ascertain the nature and extent of buried cultural materials at 5LP2616 and 5LP6456, and data recovery excavations (if necessary and appropriate)	

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		determines that these sites contain significant archaeological deposits that will be affected, mitigation of adverse effects will also be accomplished through data recovery excavations, as outlined in the MOA referenced above.	would preclude the loss of important archaeological data.	
Hazardous Materials	Construction activities for the Preferred Alternative could cause a release of hazardous materials into the environment from 10 sites located along the US 550 corridor.	Sampling and further investigation will be completed prior to construction. Further investigation shall be conducted to determine if impacts to the soil and/or groundwater have occurred at the locations discussed in Section 3.18-1. If impacts to the soil and/or groundwater have occurred at any of the above locations, CDOT will report the contamination to the appropriate regulatory authority and implement avoidance and/or containment procedures prior to construction to ensure worker safety and avoid a potential release to the environment. Where appropriate, CDOT may further characterize the contamination at a site and remediate it per regulatory requirements.	Sampling and further investigation would confirm the absence or presence of potential recognized environmental concerns associated with the above 10 sites. Avoidance, containment, and possible remediation would avoid a potential release to the environment during construction activities.	
Construction	Access to business and residential areas would be impacted during construction.	Temporary signage to business entrances will be provided during construction to draw attention to highway access points. Highway users will be impacted by temporary road closures or detours.		

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	Highway users would be impacted by temporary road closures or detours.	Major traffic disruption will be limited to the off-peak hours as much as possible to alleviate congestion, reduce capacity impacts, and lessen economic impacts. Public notices will be provided through newspapers and local signs to warn motorists of future detours and road closures. The shortest, most direct detours will be used, with adequate signing to limit additional travel to the extent possible. Flaggers will be placed immediately adjacent to work areas to optimize traffic flow during periods of construction activities and to reduce delays. Coordinate with emergency service providers and provide a contact system during construction to minimize delays and response times for emergency services.	The mitigation measures described will minimize impacts to businesses, the traveling public, and local residents.	