

3.0 AFFECTED ENVIRONMENT

This section is divided into resource categories such as topography, soils, water, vegetation, wildlife, socioeconomics, and so forth. Each category begins with a description of existing conditions in the project area, followed by the potential impacts of each alternative and the potential impacts of the connected action, along with a comparison of the alternatives. At the end of Section 3 is a discussion of secondary and cumulative effects (this project in combination with other projects) and a summary of alternative effects.

3.1 RESOURCES THAT WILL NOT BE AFFECTED BY THE PROPOSED ACTIONS OR ALTERNATIVES

According to BLM mining indices, no mineral resources (active, closed, or voided mining claims) are known to occur on the BLM lands where the project is proposed to take place (BLM, 2004). No springs, seeps, or vegetation that would indicate the presence of wetlands or riparian zones were observed during the biological survey. No wild or scenic rivers are present in the proposed project area. There are no wilderness or wilderness study areas in the proposed project area. No Indian Trust Assets (legal interests in assets held in trust by the U.S. Government for Native American Indian Tribes or individual tribal members) are present in the proposed project area.

Groundwater resources would not be affected by the proposed road construction project, as no groundwater extraction, drilling, excavation, or other activities are planned that would intersect with the groundwater table. However, groundwater may be affected if private lands are subdivided as a consequence of improving the roads and providing right-of-way. This potential impact is discussed under Water Resources, Connected Action (Section 3.2.3.12).

Best Management Practices would be used to avoid the introduction of petroleum products or other toxic materials into the groundwater during road construction. Resources that would not be affected by the proposed project are not addressed further in this analysis.

3.2 LAND RESOURCES

3.2.1 Topography, Geology, and Climate

3.2.1.1 Existing Conditions

The El Monte Roads project area is on rangelands managed by the BLM, in gently to moderately rolling hills with steep to broad drainages. Elevations in the project area range from approximately 6,045 to 6,720 feet above mean sea level.

The proposed project area is in the Southern Rocky Mountain physiographic province (Williams, 1986), defined by the uplift of the Rocky Mountains 50 to 100 million years ago. The area is in the eastern foothills of the Jemez Mountains, adjacent to the Casa Del Rio Plateau, and traverses rolling hills or drainages. The closest meteorological station to the project area is in Santa Fe. The annual mean temperature range for this station is 93.7°F to -4.4°F (34.3°C to -15.3°C). The total yearly mean precipitation is about 13 inches (330 mm) [Bahm et al., 1985].

Road Segments 6 and 7 of Alternatives A, C, and E follow the tops of ridges. Road Segment 1 of Alternatives A and B crosses a ridge. Road Segment 9 of Alternatives B, D, and F is in a valley bottom. Road Segment 10 of Alternatives E and F follows and crosses Calabasa Arroyo. Road Segment 11 crosses rolling hills.

3.2.1.2 Direct Impacts Associated with Alternative A (Road Segments 1, 2, 3, 4, 5, 6, 7)

Construction Term and Roadway Margin Impacts

If Alternative A is implemented, a section of the new road segment that crosses a hill at the southern end of the main road (Segment 1) will require 200 feet of a 100-foot-wide right-of-way for recontouring. Approximately 2.8 acres of land will be recontoured at the road edges in the 100-foot right-of-way section.

Long-Term Roadway Impacts

If Alternative A is implemented, some minor, localized recontouring of the landscape at 12 arroyos and on five hills may be necessary to accommodate the proposed action or to facilitate and control surface water movement. The construction processes should not excessively alter the topography. All substrates would be stabilized immediately following construction.

3.2.1.3 Direct Impacts Associated with Alternative B (Road Segments 1, 2, 3, 4, 5, 9)

Construction Term and Roadway Margin Impacts

If Alternative B is implemented, a section of the new road segment that crosses a hill at the southern end of the main road (Segment 1) will require 200 feet of a 100-foot-wide right-of-way for recontouring. Approximately 2.8 acres of land will be recontoured at the road edges in the 100-foot right-of-way section.

Long-Term Roadway Impacts

If Alternative B is implemented, some minor, localized recontouring of the landscape at 19 arroyos and on two hills may be necessary to facilitate and control surface water movement. Considerable recontouring would be necessary at the 19 arroyo crossings. The road may have to be rerouted to avoid major arroyo crossings, requiring cut and fill operations on hillsides adjacent to the arroyo that may cause impacts to topography and geology. All substrates should be stabilized immediately following construction.

3.2.1.4 Direct Impacts Associated with Alternative C (Road Segments 2, 3, 4, 5, 6, 7, 8)

Construction Term and Roadway Margin Impacts

If Alternative C is implemented, there will be minimal specific temporary construction or roadway margin impacts to topography, geology, or climate.

Long-Term Roadway Impacts

If Alternative C is implemented, the landscape will need to be recontoured at 12 arroyos and four hills to facilitate or control surface water movement and for safety and slope stability. The construction process should not excessively alter the topography in the overall project area. Localized topography changes caused by road construction may be noticeable. All substrates would be stabilized immediately following construction.

3.2.1.5 Direct Impacts Associated with Alternative D (Road Segments 2, 3, 4, 5, 8, 9)

Construction Term and Roadway Margin Impacts

If Alternative D is implemented, there will be minimal specific temporary construction or roadway margin impacts to topography, geology, or climate.

Long-Term Roadway Impacts

If Alternative D is implemented, the landscape will need to be recontoured at 19 arroyos and two hills to facilitate or control surface water movement. The construction process should not excessively alter the topography. All substrates would be stabilized immediately following construction.

3.2.1.6 Direct Impacts Associated with Alternative E (Road Segments 3, 4, 5, 6, 7, 10, 11)

Construction Term and Roadway Margin Impacts

If Alternative E is implemented, the new road segment (11) around the south and east sides of Section 15 to the juncture with Segment 7, where the terrain is hilly, will require up to a 100-foot right-of-way to allow for cut-and-fill slopes (B. Walbridge, personal communication 8 September 2003). The cut-and-fill slopes will be required on each of the hills through this section and will alter the existing natural topography.

Long-Term Roadway Impacts

If Alternative E is implemented, some minor, localized recontouring of the landscape would be required at 19 arroyos for culvert placement and at one hill for safety and slope stability along the main north-south access road. Recontouring of five hillsides would be necessary for safety and slope stability along newly constructed roadway (Segment 11).

3.2.1.7 Direct Impacts Associated with Alternative F (Road Segments 4, 5, 9, 10, 11, 12)

Construction Term and Roadway Margin Impacts

If Alternative F is implemented, the new road segments (11 and 12) around the south and east sides of Section 15, where the terrain is hilly, will require up to a 100-foot right-of-way to allow for cut-and-fill slopes (Walbridge, personal communication 8 September 2003). The cut-and-fill slopes will be required on each of the hills through this section and will alter the existing natural topography.

Long-Term Roadway Impacts

If Alternative F is implemented, 26 arroyos would be subject to minor, localized recontouring for culvert placement. Seven hillsides would require recontouring for safety and slope stability (Segments 11 and 12). All substrates would be stabilized immediately following construction.

3.2.1.8 Direct Impacts Associated with Alternative G (Segments 1, 2, 3, 4, 5, east half of 7, 13)

Construction Term and Roadway Margin Impacts

If Alternative G is implemented, a section of the new road segment (1) that crosses a hill at the south end of the main road (Segment 1) will require 200 feet of a 100-foot-wide right-of-way for recontouring. Approximately 2.8 acres of land will be recontoured at the road edges in the 100-foot right-of-way section.

Long-Term Roadway Impacts

If Alternative G is implemented, some minor, localized recontouring of the landscape at nine arroyos and on five hills may be necessary to facilitate and control surface water movement. Considerable re-contouring would be necessary at two arroyo crossings. One of the arroyos at Road Segment 13 is 140 feet wide and will require major recontouring to facilitate crossing. All substrates should be stabilized immediately following construction.

3.2.1.9 Direct Impacts Associated with Alternative H (Segments 2, 3, 4, 5, east half of 7, 8, 13)

Construction Term and Roadway Margin Impacts

If Alternative H is implemented, there will be minimal specific temporary construction or roadway margin impacts to topography, geology, or climate.

Long-Term Roadway Impacts

If Alternative H is implemented, the landscape will need to be recontoured at nine arroyos and four hills to facilitate or control surface water movement. One of the arroyos at Road Segment 13 is 140 feet wide and will require major recontouring to facilitate crossing. All substrates would be stabilized immediately following construction.

3.2.1.10 Secondary Impacts Common to Horcado Ranch Road Access Alternatives (Alternatives A, B, C, D, G, H)

There will be no specific construction term, road margin, or roadway impacts to topography, geology, or climate at Horcado Ranch Road, Estrada Calabasa, Paseo de la Tierra, or Camino la Tierra or to the communities of Las Dos and La Tierra as a result of this project.

3.2.1.11 Secondary Impacts Common to Buckman Road Access Alternatives (Alternatives E and F)

There will be no specific construction term, road margin, or roadway impacts to topography or climate at Buckman Road or Camino la Tierra or to the communities of Las Campañas and La Tierra Nueva as a result of this project.

3.2.1.12 Direct Impacts Associated with Alternative I (the No Action Alternative)

If Alternative I is implemented, there will be no landscape recontouring. Without recontouring of the landscape to facilitate and control surface water movement along the existing roads (Road Segments 2, 3, 4, 5, 6, 7, 8, 9, 10), erosion will continue to be a problem along existing two-track roads.

3.2.1.13 Comparison of Action Alternatives

Alternative A, the Proposed Action, would involve major recontouring and a 100-foot-wide right-of-way at one hill on the south end. Alternative C uses existing roads for its entire length and thus would have the least impact to arroyos and hills.

Alternatives B and D, utilizing Road Segment 9, would require recontouring at 13 arroyos. Two of these crossings are 110 and 130 feet wide, respectively, and involve the main-stem arroyo that follows the road. In comparison, Road Segments 6 and 7 (Alternatives A, C, and E) would require recontouring at six arroyos.

Alternatives E and F (the Buckman Road Access Alternatives) would require recontouring on six and seven hillsides, respectively, to address safety and slope stabilization problems. A 100-foot-wide right-of-way would be required to allow space for cut-and-fill slopes in the new road sections (11 and 12) around the south and east sides of Section 15. Alternative F would have the greatest impact to arroyos, affecting 26, including two main-stem arroyos that cross the road obliquely along Road Segment 9. Table 3.1 illustrates the comparative impacts of the alternatives.

Alternatives G and H would require recontouring at nine arroyos. In comparison, Alternatives A and C would both require recontouring at 12 arroyos.

3.2.1.14 Connected Action

Additional recontouring of land may result from construction of house pads and roads on the four parcels to be served by the access roads proposed under Alternatives A–H. The amount of recontouring would depend on the density of any subdivision of the properties. Subdivision density will be determined by the owners, the terrain, and State of New Mexico and Santa Fe County laws and ordinances. The likelihood and density of the potential subdivision of the properties is discussed in Section 3.8.1, Secondary and Cumulative Effects.

Table 3.1 Comparison of Impacts to Arroyos and Hills for Each Alternative

Alternative	Number of Impacted Arroyos	Number of Impacted Hills
A (Proposed Action)	12	5
B	19	2
C	12	4
D	19	2
E	19	6
F	26	7
G	9	5
H	9	4
I	0	0

3.2.2 Geology and Soils

3.2.2.1 Existing Conditions

The surface geology in the immediate vicinity of the proposed project area is dominated by the Ancha Formation, an alluvial mixture of Cenozoic silt, sand, and poorly sorted gravel occurring as a veneer (Maker et al., 1978). The entire region is part of the Española Basin of the Rio Grande Rift. The soils of the immediate project area are classified as aridisols and were created during former pluvial periods. Aridisols are susceptible to both wind and water erosion and are typically low in nutrient content. The main soil type is Pojoaque–Rough Broken Land complex, a well-drained sandy clay loam. The soil-blowing hazard and water-erosion hazard are severe (Soil Conservation Service, 1975). Pojoaque-Panky association, a loam to clay loam or sandy clay loam, also with severe water-erosion and soil-blowing hazard, is present in minor amounts. Soils and geology do not vary among the routes followed by the different alternatives.

3.2.2.2 Direct Impacts Associated with Alternative A (Road Segments 1, 2, 3, 4, 5, 6, 7)

Construction Term and Roadway Margin Impacts

If Alternative A is implemented, approximately 22.4 acres of previously undisturbed soil will be disturbed during construction of the road. This area includes 200 feet of a 100-foot-wide right-of-way to cut down a steep ridge at the south end of Road Segment 1 and 0.39 mile of new road. Land will be cleared by grading and grubbing the road. The erosion potential rate would be high in areas where vegetation is removed by road construction because the soil types have a severe water erosion hazard. Tree removal or transplantedation would be accomplished under BLM direction. Revegetation would be completed when the project is finished per BLM stipulations, removing the danger of erosion.

Long-Term Roadway Impacts

If Alternative A is implemented, about 7.4 acres of previously undisturbed soil will be permanently covered with gravel roadway.

3.2.2.3 Direct Impacts Associated with Alternative B (Road Segments 1, 2, 3, 4, 5, 9)

Construction Term and Roadway Margin Impacts

If Alternative B is implemented, approximately 19.7 acres of previously undisturbed soil will be disturbed during construction of the road. This area includes 200 feet of a 100-foot-wide right-of-way to cut down a steep ridge at the south end of Road Segment 1 and 0.39 mile of new road. Disturbance will be created by clearing, grading, and grubbing the road. The erosion potential rate would be high in areas where vegetation is removed by road construction because the soil types have a severe water erosion hazard. Tree removal or transplantation would be accomplished under BLM direction. Revegetation would be completed when the project is finished per BLM stipulations, removing the danger of erosion.

Long-Term Roadway Impacts

If Alternative B is implemented, about 6.6 acres of previously undisturbed soil will be permanently covered with gravel roadway.

3.2.2.4 Direct Impacts Associated with Alternative C (Road Segments 2, 3, 4, 5, 6, 7, 8)

Construction Term and Roadway Margin Impacts

If Alternative C is implemented, approximately 21.3 acres of previously undisturbed soil will be disturbed during construction of the road. No new road will be constructed under this alternative. Disturbance will be created by clearing, grading, and grubbing the road. The erosion potential rate would be high in areas where vegetation is removed by road construction because the soil types have a severe water erosion hazard. Tree removal or transplantation will be accomplished under BLM direction. Revegetation would be completed when the project is finished per BLM stipulations, removing the danger of erosion.

Long-Term Roadway Impacts

If Alternative C is implemented, about 6.7 acres of previously undisturbed soil will be permanently covered with gravel roadway.

3.2.2.5 Direct Impacts Associated with Alternative D (Road Segments 2, 3, 4, 5, 8, 9)

Construction Term and Roadway Margin Impacts

If Alternative D is implemented, approximately 18.6 acres of previously undisturbed soil will be disturbed during construction of the road. No new road will be constructed under this alternative. Disturbance will be created by clearing, grading, and grubbing the road. The erosion potential rate would be high in areas where vegetation is removed by road construction because the soil types have a severe water erosion hazard. Tree removal or transplantation will be accomplished under BLM direction. Revegetation would be completed when the project is finished per BLM stipulations, removing the danger of erosion.

Long-Term Roadway Impacts

If Alternative D is implemented, about 5.9 acres of previously undisturbed soil will be permanently covered with gravel roadway.

3.2.2.6 Direct Impacts Associated with Alternative E (Road Segments 3, 4, 5, 6, 7, 10, 11)

Construction Term and Roadway Margin Impacts

If Alternative E is implemented, approximately 37.8 acres of previously undisturbed soil will be disturbed during construction of the road, including 0.71 mile of new road. Disturbance will be created by clearing, grubbing, and grading of the road. The erosion potential rate would be high in areas where vegetation is removed by road construction because the soil types have a severe water erosion hazard. Tree removal or transplantation would be accomplished under BLM direction. Revegetation would be completed when the project is finished per BLM stipulations, removing the danger of erosion.

Long-Term Roadway Impacts

If Alternative E is implemented, about 11.3 acres of previously undisturbed soil will be permanently covered with gravel roadway.

3.2.2.7 Direct Impacts Associated with Alternative F (Road Segments 4, 5, 9, 10, 11, 12)

Construction Term and Roadway Margin Impacts

If Alternative F is implemented, approximately 34.3 acres of previously undisturbed soil will be disturbed during construction of the road, including 1.1 miles of new road. Disturbance will be created by clearing, grubbing, and grading the road. The erosion potential rate would be high in areas where vegetation is removed by road construction because the soil types have a severe water erosion hazard. Tree removal or transplantation would be accomplished under BLM direction. Revegetation would be completed when the project is finished per BLM stipulations, removing the danger of erosion.

Long-Term Roadway Impacts

If Alternative F is implemented, about 9.8 acres of previously undisturbed soil will be permanently covered with gravel roadway.

3.2.2.8 Direct Impacts Associated with Alternative G (Road Segments 1, 2, 3, 4, 5, east half of 7,13)

Construction Term and Roadway Margin Impacts

If Alternative G is implemented, approximately 17.7 acres of previously undisturbed soil will be disturbed during construction of the road. This area includes 200 feet of a 100-foot-wide right-of-way to cut down a steep ridge at the south end of Road Segment 1 and 0.85 mile of new road. Disturbance will be created by clearing, grading, and grubbing of the road. The erosion potential rate would be high in areas where vegetation is removed by road construction because the soil

types have a severe water erosion hazard. Tree removal or transplantation would be accomplished under BLM direction. Revegetation would be completed when the project is finished per BLM stipulations, removing the danger of erosion.

Long-Term Roadway Impacts

If Alternative G is implemented, about 6.4 acres of previously undisturbed soil will be permanently covered with gravel roadway.

3.2.2.9 Direct Impacts Associated with Alternative H (Road Segments 2, 3, 4, 5, east half of 7, 8, 13)

Construction Term and Roadway Margin Impacts

If Alternative H is implemented, approximately 16.7 acres of previously undisturbed soil will be disturbed during construction of the road. About 0.46 mile of new road will be constructed under this alternative. Disturbance will be created by clearing, grading, and grubbing of the road. The erosion potential rate would be high in areas where vegetation is removed by road construction because the soil types have a severe water erosion hazard. Tree removal or transplantation would be accomplished under BLM direction. Revegetation would be completed when the project is finished per BLM stipulations, removing the danger of erosion.

Long-Term Roadway Impacts

If Alternative H is implemented, about 5.7 acres of previously undisturbed soil will be permanently covered with gravel roadway.

3.2.2.10 Secondary Impacts Common to Horcado Ranch Road Access Alternatives (Alternatives A, B, C, D, G, H)

During the 1-year period of construction, construction-related traffic traveling along Horcado Ranch Road, a 3-mile-long dirt road, would loosen and stir up dust and potentially increase the rate and severity of washboarding or formation of erosional features.

3.2.2.11 Secondary Impacts Common to Buckman Road Access Alternatives (Alternatives E and F)

Construction traffic traveling along Buckman Road, a 3-mile-long dirt road from the end of Camino la Tierra to the west end of Segment 10, would loosen and stir up dust and potentially increase the rate and severity of washboarding or formation of erosional features over a period of 1-1/2 to 2 years.

3.2.2.12 Direct Impacts Associated with Alternative I (the No Action Alternative)

If the No Action Alternative is implemented, there will be no improvements on two-track roads in the project area. Erosional features resulting from unstabilized slopes and arroyo crossings would continue to develop with continuing use of the roads as access to the private properties. This erosion is most notable on the north-facing hill at the north end of Segment 3 and along the

13 arroyo crossings at Segment 9. Head-cutting would also continue to develop where the road follows the edge of Calabasa Arroyo on the northeast end of Segment 10.

3.2.2.13 Comparison of Action Alternatives

Alternative H would cause the least (16.7 acres) temporary soil disturbance. Alternative G would cause the next smallest amount of disturbance (17.7 acres). Both of these alternatives would have an indirect construction term effect of impacting soils on the unpaved Horcado Ranch Road. The most soil disturbance would be created by implementing Alternative E or Alternative F. Alternatives C and D would be constructed solely on two-tracks and thus would involve the least amount of disturbance (0.0 acres) in currently unroaded areas. Alternatives E and F would require the greatest amount of new road development (37.8 and 34.3 acres, respectively) and would have the greatest amount of permanently buried/disturbed soils (11.3 and 9.8 acres, respectively) under roadway. This disturbance would include a section of 100-foot-wide right-of-way around the south and east sides of Section 15 to allow for cut and fill to improve line of sight for cars using the road and decrease erosion in the road. In addition, Alternatives E and F would have an indirect construction term effect of impacting soils on the unpaved Buckman Road. The degree of soil disturbance under the alternatives is shown in Table 3.2. The soils are homogeneous and highly erosive throughout the project area, so there will be no benefit from one alternative over the others from the viewpoint of soil stability. The NRCS describes the soil erosion potential of the soil types in the project area as "severe." Erosion would only be a factor during road construction, as disturbed areas would be revegetated as soon as construction was completed. The alternatives with the least amount of soil disturbance, such as Alternatives G and H, would have the least potential erosional impact in the project area.

Table 3.2. Acreage of Soil Disturbance for Each Alternative

Alternative	Soil Disturbance on Roadway Margins (acres)	Permanently Buried Soils on Roadway (acres)
A (Proposed Action)	22.4	7.4
B	19.7	6.6
C	21.3	6.7
D	18.6	5.9
E	37.8	11.3
F	34.3	9.8
G	17.7	6.4
H	16.7	5.7
I	0.0	0.0

3.2.2.14 Connected Action

Additional soil disturbance may result from construction of house pads and roads on the four parcels to be served by the access roads proposed under Alternatives A–H. The amount of disturbance would depend on the density of any subdivision of the properties. The density of subdivision will be determined by the owners, the terrain, and State of New Mexico and Santa Fe County laws and ordinances. At maximum buildout of properties (12.5-acre lots with 1/4 acre of construction per lot), impervious surfaces could cover approximately 32 acres, leading to a

possibility of soil loss through erosion from water runoff associated with these surfaces. The likelihood and density of the potential subdivision of the properties is discussed in Section 3.8.1, Secondary and Cumulative Effects.

3.2.3 Water Resources

3.2.3.1 Existing Conditions

The project area lies within the Santa Fe drainage of the Rio Grande basin. There are no permanent sources of surface water within the project area. However, the proposed alternatives cross several ephemeral waterways that have defined beds and banks and are under the jurisdiction of the U.S. Army Corps of Engineers (USACE). The locations of these waterways are shown in Tables 3.3 and 3.4 and on Figure 3.1. Water from rain or snowmelt, particularly in large quantities, may percolate into the underground aquifer or drain into permanent surface water systems.

No wells have been drilled on the BLM lands that are discussed in this report. Depth to groundwater is between 600 feet and 700 feet in two wells on the Ortiz-Walker properties (L. Walker, personal communication 8 September 2003). Well depth is between 560 feet and 745 feet in four wells that have been drilled in all of the private lands of the El Monte Roads Association (BLM, 2003). Four supplemental wells have been drilled along Buckman Road. With these wells, the projected change in the estimated saturated water column would range from an increase of 5 feet to a decrease of 70 feet in these private lands by the year 2060 (BLM, 2003).

Alternatives E and F cross Calabasa Arroyo (a major arroyo, 250 feet wide), which would have to be bridged. Segment 9 of Alternatives B, D, and F crosses 13 arroyos with a combined width of 369 feet, a greater number of arroyos than any other road segment (Table 3.3).

3.2.3.2 Direct Impacts Associated with Alternative A (Road Segments 1, 2, 3, 4, 5, 6, 7)

Construction Term and Roadway Margin Impacts

If Alternative A is implemented, surface water quality may potentially be affected by increased siltation from loosening of soils and subsequent runoff during construction. These waters could be further contaminated by petroleum products and other debris leaked, spilled, or left behind by construction operations. However, any spills of petroleum products by construction vehicles in greater than nominal amounts would be cleaned up immediately by work crews to avoid potential runoff of these products into nearby arroyos. The effects of erosion would be mitigated by using silt fencing, straw bales, straw wattles, or straw mulch and other Best Management Practices and by maintaining construction vehicles. Placement of erosion control devices may stir some soil but would be done under dry conditions so there would be no impact to resources from this activity. Under Alternative A, 11 arroyos with a total width of 381 feet would be impacted by construction (Table 3.4). Construction at arroyo crossings can include grading with bulldozers and road graders, placement of culverts, placement of fill around and over culverts, and bank

Table 3.3. Ephemeral Waterways in Project Area

Road Segment	Waterway Crossing	Easting	Northing	Width (feet)	Comments
2	2.1	404299.4	3961704.03	2	
2	2.2	404512.12	3961020.37	30	
2	2.3	404568.31	3960746.03	115	existing road crosses at oblique angle
Total Segment 2	3			147	
3	3.1	404886	3963280.59	85	banks not well defined
3	3.1	404271.19	3961919.15	5	
Total Segment 3	2			90	
4	4.1	404870.04	3963374.19	85	banks not well defined
Total Segment 4	1			85	
6	6.1	404872	3963407	4	
6	6.2	404729.42	3963369.15	40	
6	6.3	404635.12	3963389.21	10	
Total Segment 6	3			54	
7	7.1	404050.55	3961779.92	3	
7	7.2	404022.59	3961749.87	2	
Total Segment 7	2			5	
9	9.1	404823.87	3963318.15	130	banks at braided channels; sheet flow area
9	9.2	404631.48	3963276.19	70	
9	9.3	404484.93	3963216.48	20	braided arroyo with 3-foot channels
9	9.4	404342.79	3963115.66	3	
9	9.5	404291.89	3963070.99	110	mainstem arroyo oxbow; UTM at midpoint
9	9.6	404237.11	3962980.53	6	
9	9.7	404036.73	3962829.77	4	
9	9.8	403824.8	3962730.91	2	braided
9	9.9	403814	3962677	4	
9	9.10	403629.8	3962452.16	4	many headcuts that road goes around past this point
9	9.11	403618.33	3962422.53	2	
9	9.12	403593.34	3962398.41	10	
9	9.13	403363	3961940	4	
Total Segment 9	13			369	

Table 3.3. Ephemeral Waterways in Project Area, continued

Road Segment	Waterway Crossing	Easting	Northing	Width (feet)	Comments
10	10.1	402982.69	3960290.19	3	
10	10.2	402960.71	3960276.15	4	
10	10.3	402933.52	3960228.25	45	
10	10.4	401740	3959108	250	east side of Calabasa Arroyo
10	10.5	401673.21	3959084.74		west side of Calabasa Arroyo
10	10.6	400237.05	3959194.83	2	
Total Segment 10	6			304	
11	11.1	403192.62	3960643.15	2	
11	11.2	403188.39	3960433.73	2	
11	11.2	403187.76	3960331.39	3	
11	11.4	403106.85	3960293.59	3	
11	11.5	403009	3960290	2	
Total Segment 11	5			12	
12	12.1	403202.92	3961761.18	140	
12	12.2	403198.55	3961627.93	5	
Total Segment 12	2			157	
13	13.1	403202.92	3961761.18	140	
Total Segment 13	1			140	

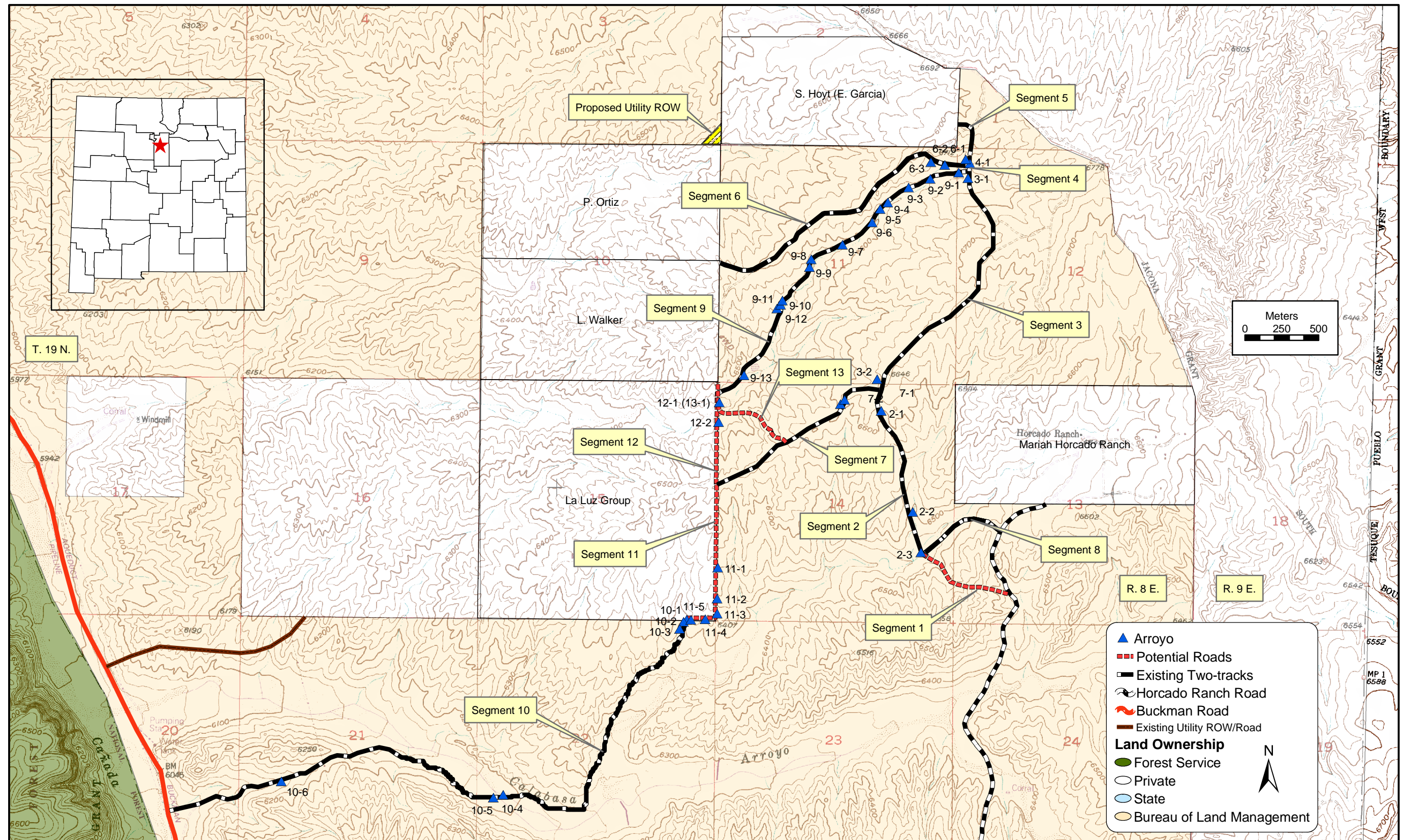
stabilization such as placement of riprap. The total surface area of arroyos in the right-of-way that would be affected by construction is approximately 0.44 acre.

Long-Term Roadway Impacts

If Alternative A is implemented, 11 arroyos would be stabilized with culverts and riprap at road crossings. Increased sedimentation from vehicles crossing unstabilized arroyos would be diminished after road construction is completed.

Table 3.4. Number of Arroyos and Total Width and Surface Area that May Be Impacted by Road Construction under Each Alternative

Alternative	Number of Arroyos	Total Width (feet)	Total Surface Area in Right-of-Way
A (Proposed Action)	11	381	19,050 sq. ft. (0.44 acre)
B	19	691	34,550 sq. ft. (0.8 acre)
C	11	381	19,050 sq. ft. (0.44 acre)
D	19	691	34,550 sq. ft. (0.8 acre)
E	17	545	27,250 sq. ft. (0.6 acre)
F	19	915	45,750 sq. ft. (1.05 acres)
G	9	382	19,100 sq. ft. (0.44 acre)
H	9	382	19,100 sq. ft. (0.44 acre)
I	0	0.0	0.0 sq. ft. (0.0 acre)



Source: BLM/USGS, 2003

SWCA Environmental Consultants, 2004

Figure 3.1. Arroyos along alternative alignments.

3.2.3.3 Direct Impacts Associated with Alternative B (Road Segments 1, 2, 3, 4, 5, 9)

Construction Term and Roadway Margin Impacts

If Alternative B is implemented, surface water quality may be affected by increased siltation from the loosening of soils during construction and subsequent runoff. These waters may be further contaminated by petroleum products and other debris leaked, spilled, or left behind by construction operations. However, any spills of petroleum products by construction vehicles in greater than nominal amounts would be cleaned up immediately by work crews to avoid potential runoff of these products into nearby arroyos. The effects of erosion would be mitigated by using silt fencing, straw bales, straw wattles, or straw mulch and other Best Management Practices and by maintaining construction vehicles. Placement of erosion control devices may stir some soil but would be done under dry conditions so there would be no impact to resources from this activity. Under Alternative B, 19 arroyos with a total width of 691 feet would be impacted by construction (Table 3.4). Construction at arroyo crossings can include grading with bulldozers and road graders, placement of culverts, placement of fill around and over culverts, and bank stabilization such as placement of riprap. The total surface area of arroyos in the right-of-way that would be affected by construction is approximately 0.8 acre.

Long-Term Roadway Impacts

If Alternative B is implemented, 19 arroyos would be stabilized with culverts and riprap at road crossings. Increased sedimentation from vehicles crossing unstabilized arroyos would be diminished after road construction is completed.

3.2.3.4 Direct Impacts Associated with Alternative C (Road Segments 2, 3, 4, 5, 6, 7, 8)

Construction Term and Roadway Margin Impacts

If Alternative C is implemented, surface water quality may be affected by increased siltation from loosening of soils during construction and subsequent runoff. These waters may be further contaminated by petroleum products and other debris leaked, spilled, or left behind by construction operations. However, any spills of petroleum products by construction vehicles in greater than nominal amounts would be cleaned up immediately by work crews to avoid potential runoff of these products into nearby arroyos. The effects of erosion would be mitigated by using silt fencing, straw bales, straw wattles, or straw mulch and other Best Management Practices and by maintaining construction vehicles. Placement of erosion control devices may stir some soil but would be done under dry conditions so there would be no impact to resources from this activity. Under Alternative C, 11 arroyos with a total width of 381 feet would be impacted by construction (Table 3.4). Construction at arroyo crossings can include grading with bulldozers and road graders, placement of culverts, placement of fill around and over culverts, and bank stabilization such as placement of riprap. The total surface area of arroyos in the right-of-way that would be affected by construction is approximately 0.44 acre.

Long-Term Roadway Impacts

If Alternative C is implemented, 11 arroyos would be stabilized with culverts and riprap at road crossings. Increased sedimentation from vehicles crossing unstabilized arroyos would be diminished after road construction is completed.

3.2.3.5 Direct Impacts Associated with Alternative D (Road Segments 2, 3, 4, 5, 8, 9)

Construction Term and Roadway Margin Impacts

If Alternative D is implemented, surface water quality may be affected by increased siltation from loosening of soils during construction and subsequent runoff. These waters may be further contaminated by petroleum products and other debris leaked, spilled, or left behind by construction operations. However, any spills of petroleum products by construction vehicles in greater than nominal amounts would be cleaned up immediately by work crews to avoid potential runoff of these products into nearby arroyos. The effects of erosion would be mitigated by using silt fencing, straw bales, straw wattles, or straw mulch and other Best Management Practices and by maintaining construction vehicles. Placement of erosion control devices may stir some soil but would be done under dry conditions so there would be no impact to resources from this activity. Under Alternative D, 19 arroyos with a total width of 691 feet would be impacted by construction (Table 3.4). Construction at arroyo crossings can include grading with bulldozers and road graders, placement of culverts, placement of fill around and over culverts, and bank stabilization such as placement of riprap. The total surface area of arroyos in the right-of-way that would be affected by construction is approximately 0.8 acre.

Long-Term Roadway Impacts

If Alternative D is implemented, 19 arroyos would be stabilized with culverts and riprap at road crossings. Increased sedimentation from vehicles crossing unstabilized arroyos would be diminished after road construction is completed.

3.2.3.6 Direct Impacts Associated with Alternative E (Road Segments 3, 4, 5, 6, 7, 10, 11)

Construction Term and Roadway Margin Impacts

If Alternative E is implemented, surface water quality may be affected by increased siltation from loosening of soils during construction and subsequent runoff. These waters may be further contaminated by petroleum products and other debris leaked, spilled, or left behind by construction operations. However, any spills of petroleum products by construction vehicles in greater than nominal amounts would be cleaned up immediately by work crews to avoid potential runoff of these products into nearby arroyos. The effects of erosion would be mitigated by using silt fencing, straw bales, straw wattles, or straw mulch and other Best Management Practices and by maintaining construction vehicles. Placement of erosion control devices may stir some soil but would be done under dry conditions so there would be no impact to resources from this activity. Under Alternative E, 18 arroyos with a total width of 545 feet would be impacted by construction (Table 3.4). Construction at arroyo crossings can include grading with bulldozers and road graders, placement of culverts, placement of fill around and over culverts, and bank stabilization such as placement of riprap. In addition, a bridge would be built across

Calabasa Arroyo. The total surface area of arroyos in the right-of-way that would be affected by construction is approximately 0.6 acre.

Long-Term Roadway Impacts

If Alternative E is implemented, 18 arroyos would be stabilized with culverts and riprap at road crossings. Increased sedimentation from vehicles crossing 13 unstabilized arroyos would be diminished after road construction is completed. In Road Segment 11, five of these arroyos would be crossed by new road construction on the south and west sides of Section 15.

3.2.3.7 Direct Impacts Associated with Alternative F (Road Segments 4, 5, 9, 10, 11, 12)

Construction Term and Roadway Margin Impacts

If Alternative F is implemented, surface water quality may be affected by increased siltation from loosening of soils during construction and subsequent runoff. These waters may be further contaminated by petroleum products and other debris leaked, spilled, or left behind by construction operations. However, any spills of petroleum products by construction vehicles in greater than nominal amounts would be cleaned up immediately by work crews to avoid potential runoff of these products into nearby arroyos. The effects of erosion would be mitigated by using silt fencing, straw bales, straw wattles, or straw mulch and other Best Management Practices and by maintaining construction vehicles. Placement of erosion control devices may stir some soil but would be done under dry conditions so there would be no impact to resources from this activity. Under Alternative F, 26 arroyos with a total width of 915 feet would be impacted by construction (Table 3.4). Construction at arroyo crossings can include grading with bulldozers and road graders, placement of culverts, placement of fill around and over culverts, and bank stabilization such as placement of riprap. In addition, a bridge would be constructed across Calabasa Arroyo. The total surface area of arroyos in the right-of-way that would be affected by construction is approximately 1.05 acres.

Long-Term Roadway Impacts

If Alternative F is implemented, 26 arroyos would be stabilized with culverts and riprap at road crossings. Increased sedimentation from vehicles crossing seven unstabilized arroyos would be diminished after road construction is completed. In Road Segments 11 and 12, seven of these arroyos would be crossed by new road construction on the south and west sides of Section 15.

3.2.3.8 Direct Impacts Associated with Alternative G (Road Segments 1, 2, 3, 4, 5, east half of 7, and 13)

Construction Term and Roadway Margin Impacts

If Alternative G is implemented, surface water quality may be affected by increased siltation from the loosening of soils during construction and subsequent runoff. These waters may be further contaminated by petroleum products and other debris leaked, spilled, or left behind by construction operations. However, any spills of petroleum products by construction vehicles in greater than nominal amounts would be cleaned up immediately by work crews to avoid potential runoff of these products into nearby arroyos. The effects of erosion would be mitigated

by using silt fencing, straw bales, straw wattles, or straw mulch and other Best Management Practices and by maintaining construction vehicles. Placement of erosion control devices may stir some soil but would be done under dry conditions so there would be no impact to resources from this activity. Under Alternative G, nine arroyos with a total width of 382 feet would be impacted by construction (Table 3.4). Construction at arroyo crossings can include grading with bulldozers and road graders, placement of culverts, placement of fill around and over culverts, and bank stabilization such as placement of riprap. The total surface area of arroyos in the right-of-way that would be affected by construction is approximately 0.44 acre.

Long-Term Roadway Impacts

If Alternative G is implemented, nine arroyos would be stabilized with culverts and riprap at road crossings. One of these is a 140-foot-wide crossing that would require a cement box culvert and major stabilization above and below the crossing (Louis Berger Group, personal communication 3 May 2004). Increased sedimentation from vehicles crossing unstabilized arroyos would be diminished after road construction is completed.

3.2.3.9 Direct Impacts Associated with Alternative H (Road Segments 2, 3, 4, 5, 8, east half of 7, 13)

Construction Term and Roadway Margin Impacts

If Alternative H is implemented, surface water quality may be affected by increased siltation from loosening of soils during construction and subsequent runoff. These waters may be further contaminated by petroleum products and other debris leaked, spilled, or left behind by construction operations. However, any spills of petroleum products by construction vehicles in greater than nominal amounts would be cleaned up immediately by work crews to avoid potential runoff of these products into nearby arroyos. The effects of erosion would be mitigated by using silt fencing, straw bales, straw wattles, or straw mulch and other Best Management Practices and by maintaining construction vehicles. Placement of erosion control devices may stir some soil but would be done under dry conditions so there would be no impact to resources from this activity. Under Alternative H, nine arroyos with a total width of 382 feet would be impacted by construction (Table 3.4). Construction at arroyo crossings can include grading with bulldozers and road graders, placement of culverts, placement of fill around and over culverts, and bank stabilization such as placement of riprap. The total surface area of arroyos in the right-of-way that would be affected by construction is approximately 0.44 acre.

Long-Term Roadway Impacts

If Alternative H is implemented, nine arroyos would be stabilized with culverts and riprap at road crossings. One of these is a 140-foot-wide crossing that would require a cement box culvert and major stabilization above and below the crossing (Louis Berger Group, personal communication 3 May 2004). Increased sedimentation from vehicles crossing unstabilized arroyos would be diminished after road construction is completed.

3.2.3.10 Secondary Impacts Common to Horcado Ranch Road Access Alternatives (Alternatives A, B, C, D, G, H)

Unstabilized arroyos in the unpaved portion of Horcado Ranch Road would sustain construction-related impacts for 1 year. Long-term impacts such as increased sediment loads from additional residential traffic would result on the road until low-water crossings at arroyos are stabilized with culverts. At this time there is no landowner, or Santa Fe County plans to improve this section of Horcado Ranch Road. Potential traffic loads are discussed in Section 3.2.7.

3.2.3.11 Secondary Impacts Common to Buckman Road Access Alternatives (Alternatives E and F)

Unstabilized arroyos in the unpaved portion of Buckman Road would sustain construction-related impacts for 1-1/2 to 2 years. Long-term impacts such as increased sediment loads from additional residential traffic would result on the road until low-water crossings at arroyos are stabilized with culverts. Potential traffic loads are discussed in Section 3.2.7.

At this time there are plans to improve vertical and horizontal sight distances and put concrete dips in certain areas on Buckman Road to accommodate the Buckman Water Diversion Project. However, complete stabilization of arroyos is considered cost-prohibitive. The Buckman Road upgrade is planned in response to the anticipated increase in heavy-vehicle traffic associated with maintenance activities if the Buckman Diversion Project is undertaken (Buckman Diversion EIS, in progress). The road would not be upgraded to a level that would accommodate new subdivision traffic (Tierra LopezGarcia Group, 2003).

3.2.3.12 Direct Impacts Associated with Alternative I (the No Action Alternative)

If Alternative I is implemented, individuals would continue to use unimproved two-tracks in the project area. Unstabilized arroyos along the chosen alternative would continue to receive additional sediment loads from current levels of vehicular activity. There would be no construction impacts in the project area under the No Action Alternative.

3.2.3.13 Comparison of Action Alternatives

The most arroyo surface area (1.05 acres) would be impacted under Alternative F. The second greatest amount would be under Alternatives B and D (0.8 acre each). Road Segment 9, which is used under Alternatives B, D, and F, contains 13 arroyos, with an estimated 0.17 acre of disturbance area, including three major and/or oblique crossings of a mainstem arroyo. Construction of crossings of this arroyo would be cost-prohibitive, estimated at \$37,440.00 for the 48-inch culverts that would be required to stabilize them. If Alternative E or F is constructed, a bridge would have to be built across Calabasa Arroyo at an estimated cost of \$937,500.00. If Alternative E, F, G, or H is constructed, a 140-foot-wide crossing that would require a cement box culvert and major stabilization above and below the crossing would need to be constructed. The least amount of disturbance to arroyos would be under Alternatives A and C (0.44 acre each).

3.2.3.14 Connected Action

Groundwater may be drawn down as a result of development on the private lands in combination with the Buckman Wells project. Potential residents of the private lands would sink wells to get their water. At this time it is unknown whether the wells would be held in common, or individual landowners would be responsible for their own wells. Maximum water usage allowed per domestic well is 3 acre-feet/year (Office of the State Engineer, personal communication 1 April 2004), but actual use is typically much lower. According to the Office of the State Engineer, typical water use for self-supplied domestic residential use is 80 gallons per capita per day (GPCD). Potential average water usage on the private lands would range from a minimum of 2,376 to a maximum of 27,648 gallons/day, depending on the number of lots developed (ranging from 11 lots developed for family members to a subdivision with 12.5-acre lots or 128 households; household \times average household size [2.7] \times GPCD [80]) (Wilson et al., 2000).

Additional disturbance to ephemeral waterways may result from construction of house pads and roads on the four parcels to be served by the access roads proposed under Alternatives A–H. The amount of impact to ephemeral waterways would depend on the density of any subdivision of the properties. Santa Fe County land development standards preclude development within arroyos and floodplains. Ephemeral waterways must be culverted at road crossings. Each residence has the potential to place an average of 1/4 acre under roof or gravel. The impervious surface that would result would have a potential runoff increase of 2% (1/4 acre of construction on 128 lots at the maximum allowable density of development of 12.5-acre lots). The density of subdivision will be determined by the owners, the terrain, and State of New Mexico and Santa Fe County laws and ordinances. The likelihood and density of the potential subdivision of the properties is discussed in Section 3.8.1, Secondary and Cumulative Effects.

3.2.4 Floodplains and Wetlands

3.2.4.1 Existing Conditions

The project area lies within the Santa Fe drainage of the Rio Grande basin. There are no permanent sources of surface water within the project area. However, the proposed alternatives cross floodplains at Calabasa Arroyo and four of its tributaries. The locations of these drainages are listed on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) as a Zone A floodplain (floodplain for which base flood elevation has not been determined) (FEMA 1988). The locations of these waterways are shown on Figure 3.2. All arroyos in the project area channel water during heavy rainstorms and thus have flood potential, though this is not indicated on floodplain maps. No wetlands, springs, or seeps were present along any of the alternatives in the project area. Alternatives E and F cross and follow the Calabasa Arroyo floodplain, skirting numerous headcuts at Segment 10, and cross an unnamed arroyo floodplain at Segment 11. Alternatives B, D, and F follow a Zone A floodplain on an unnamed arroyo at the southwest end of Segment 9. There are two low-water crossings of tributaries of the Calabasa Arroyo floodplain at Horcado Ranch Road.

3.2.4.2 Direct Impacts Associated with Alternative A (Road Segments 1, 2, 3, 4, 5, 6, 7)

Construction Term and Roadway Margin Impacts

Alternative A has no floodplain crossings mapped on the FEMA floodplain maps. However, a major arroyo crossing is at the south end of Segment 2 before its connection with the new road construction area. If Alternative A is implemented, flooding could occur at any of the arroyos in the project area. The road construction engineer would plan culvert size to properly channel potential floods in arroyos. The Santa Fe County road construction code no longer allows low-water crossings (Santa Fe County, 1996).

Long-Term Roadway Impacts

If Alternative A is implemented, culverts would be built to withstand 100-year floods per Santa Fe County Land Development Code standards, adopted 1996. Erosion would be controlled at road crossings of arroyos. There would be no long-term roadway impacts.

3.2.4.3 Direct Impacts Associated with Alternative B (Road Segments 1, 2, 3, 4, 5, 9)

Construction Term and Roadway Margin Impacts

Alternative B has no floodplain crossings mapped on the FEMA floodplain maps. However, Alternative B has four crossings of two major unnamed arroyos. One of these is on Road Segment 2, and the other three are along Road Segment 9. If Alternative B is implemented, flooding could occur at any of the arroyos that are crossed by these road segments. The road construction engineer would plan culvert size to properly channel potential floods in arroyos. The Santa Fe County road construction code no longer allows low-water crossings (Santa Fe County, 1996).

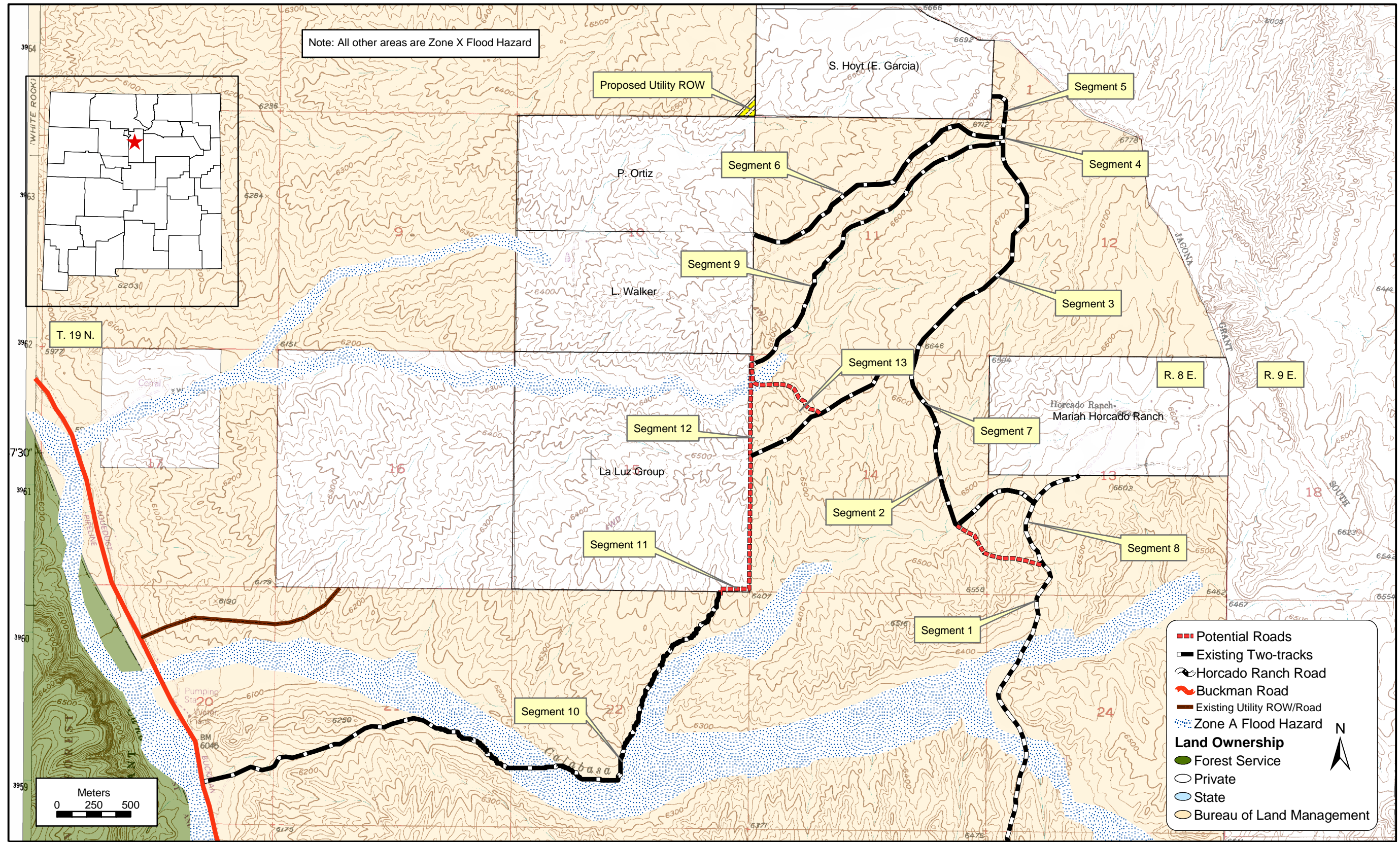
Long-Term Roadway Impacts

If Alternative B is implemented, culverts would be built to withstand 100-year floods per Santa Fe County Land Development Code standards, adopted 1996. Erosion would be controlled at road crossings. There would be no long-term roadway impacts.

3.2.4.4 Direct Impacts Associated with Alternative C (Road Segments 2, 3, 4, 5, 6, 7, 8)

Construction Term and Roadway Margin Impacts

Alternative C has no floodplain crossing mapped on the FEMA floodplain maps. However, Alternative C has one crossing of a major arroyo at the south end of Segment 2. If Alternative C is implemented, flooding could occur at this arroyo. The road construction engineer would plan culvert size to properly channel potential floods in arroyos. The Santa Fe County road construction code no longer allows low-water crossings (Santa Fe County, 1996).



Source: BLM/USGS, 2003

SWCA Environmental Consultants, 2004

Figure 3.2. Flood zones mapped by FEMA in the project area.

Long-Term Roadway Impacts

If Alternative C is implemented, culverts would be built to withstand 100-year floods per Santa Fe County Land Development Code standards, adopted 1996. Erosion would be controlled at road crossings of all arroyos. There would be no long-term roadway impacts.

3.2.4.5 Direct Impacts Associated with Alternative D (Road Segments 2, 3, 4, 5, 8, 9)

Construction Term and Roadway Margin Impacts

Alternative D has no crossing of floodplains mapped on the FEMA maps. However, Alternative D has four crossings of two major unnamed arroyos, one on Road Segment 2 and the other three along Road Segment 9. If Alternative D is implemented, flooding could occur in any of these arroyos. The road construction engineer would plan culvert size to properly channel potential floods in arroyos. The Santa Fe County road construction code no longer allows low-water crossings (Santa Fe County, 1996).

Long-Term Roadway Impacts

If Alternative D is implemented, culverts would be built to withstand 100-year floods per Santa Fe County Land Development Code standards, adopted 1996. Erosion would be controlled at road crossings. There would be no long-term roadway impacts.

3.2.4.6 Direct Impacts Associated with Alternative E (Road Segments 3, 4, 5, 6, 7, 10, 11)

Construction Term and Roadway Margin Impacts

Alternative E has one major crossing at Calabasa Arroyo, a FEMA Zone A flood zone. This crossing would require a bridge to avoid floodplain impacts. Road Segment 10 skirts headcuts of a tributary of Calabasa Arroyo and its floodplain. If Alternative E is implemented, soils would be impacted within these floodplains during construction of the Calabasa Arroyo bridge and the road to Section 15. The road construction engineer would plan culvert size to properly channel potential floods in arroyos. The Santa Fe County road construction code no longer allows low-water crossings (Santa Fe County, 1996). FEMA requires that all structures that are built in flood zones be constructed of flood-proof materials.

Long-Term Roadway Impacts

If Alternative E is implemented, the bridge crossing at Calabasa Arroyo would be built to withstand 100-year floods per Santa Fe County Land Development Code standards, adopted 1996. Erosion would be controlled at arroyo crossings. There would be no long-term roadway impacts.

3.2.4.7 Direct Impacts Associated with Alternative F (Road Segments 4, 5, 9, 10, 11, 12)

Construction Term and Roadway Margin Impacts

Alternative F has one FEMA Zone A crossing of Calabasa Arroyo and one crossing of a tributary of Cañada Ancha at the corner of Sections 10 and 15, as mapped on the FEMA floodplain maps. In addition, there are three major crossings of a tributary of Calabasa Arroyo that flows down the valley traversed by Road Segment 9. Road Segment 10 skirts headcuts off of a major tributary to Calabasa Arroyo and its floodplains. If Alternative F is implemented, soils would be impacted within these floodplains during road construction. The road construction engineer would plan culvert size to properly channel potential floods in arroyos. The Santa Fe County road construction code no longer allows low water crossings (Santa Fe County, 1996). FEMA requires that all structures that are built in flood zones be constructed of flood-proof materials.

Long-Term Roadway Impacts

If Alternative F is implemented, the bridge crossing at Calabasa Arroyo and road culverts would be built to withstand 100-year floods per Santa Fe County Land Development Code standards, adopted 1996. Erosion would be controlled at arroyo crossings. There would be no long-term roadway impacts.

3.2.4.8 Direct Impacts Associated with Alternative G (Road Segments 1, 2, 3, 4, 5, east half of 7, 13)

Construction Term and Roadway Margin Impacts

Alternative G has one floodplain crossing mapped on the FEMA floodplain maps. This floodplain crossing, on Road Segment 13, is 140 feet wide. Alternative G also has one crossing of a major arroyo at the south end of Segment 2. The road construction engineer would plan culvert size to properly channel potential floods in arroyos. The Santa Fe County road construction code no longer allows low-water crossings (Santa Fe County).

Long-Term Roadway Impacts

If Alternative G is implemented, culverts would be built to withstand 100-year floods per Santa Fe County Land Development Code standards, adopted 1996. Erosion would be controlled at road crossings. There would be no long-term roadway impacts.

3.2.4.9 Direct Impacts Associated with Alternative H (Road Segments 2, 3, 4, 5, 8, east half of 7, 13)

Construction Term and Roadway Margin Impacts

Alternative H has one floodplain crossing mapped on the FEMA floodplain maps. This floodplain crossing, on Road Segment 13, is 140 feet wide. Alternative G also has one crossing of a major arroyo at the south end of Segment 2. The road construction engineer would plan culvert size to properly channel potential floods in arroyos. The Santa Fe County road construction code no longer allows low-water crossings (Santa Fe County, 1996).

Long-Term Roadway Impacts

If Alternative H is implemented, culverts would be built to withstand 100-year floods per Santa Fe County Land Development Code standards, adopted 1996. Erosion would be controlled at road crossings. There would be no long-term roadway impacts.

3.2.4.10 Secondary Impacts Common to Horcado Ranch Road Access Alternatives (Alternatives A, B, C, D, G, H)

Low-water crossings at two tributaries of Calabasa Arroyo on Horcado Ranch Road would be impacted by additional traffic loosening soil and increasing sediment load. These crossings are already degraded due to current traffic levels and inadequate erosion control. Potential traffic increases are discussed in Section 3.2.7.

3.2.4.11 Secondary Impacts Common to Buckman Road Access Alternatives (Alternatives E and F)

No major floodplain crossings would be impacted by additional traffic downstream from the project area.

3.2.4.12 Direct Impacts Associated with Alternative I (the No Action Alternative)

If Alternative I is implemented, no improvements would be made to avoid floodplains along the chosen alternative. Soil loosening and sediment load would remain high at floodplains traversed by the private landowners.

3.2.4.13 Comparison of Action Alternatives

The greatest impact to floodplains during the construction term would occur along Alternatives E and F at the crossing of Calabasa Arroyo, a 250-foot-wide arroyo on Segment 10, and a 140-foot-wide floodplain crossing at the Cañada Ancha where Segment 12 connects to Segment 9. The Cañada Ancha floodplain is also crossed under Alternatives G and H. Alternatives E and F would require stabilization of the edges of a mapped floodplain along Road Segment 10, where numerous headcuts occur along about 0.5 mile of the edge of Calabasa Arroyo.

FEMA has not mapped any floodplains on the roads discussed under Alternatives A–D. The major arroyo crossing at these alternatives is a 115-foot-wide crossing on the south end of Segment 2 under Alternatives C and D.

Silt fencing would protect these areas from increased sedimentation during construction. Erosion control devices such as culverts, riprap, and check dams would control erosion thereafter.

3.2.4.14 Connected Action

One floodplain on a tributary of Cañada Ancha could be impacted in Section 15 if roadways are built to access lots on the north end of this section. If the land is subdivided, then floodplain

impacts could occur at a maximum of seven lots and/or road crossings. A smaller tributary of Cañada Ancha enters the west side of Section 10. This floodplain could be impacted by construction at two or three lots if the land is subdivided. The FEMA maps documented no other floodplains on parcels of land that would acquire legal access after completion of the construction of the chosen alternative in the project area. Houses may not be constructed within floodplains per Santa Fe County Land Development Code. Road crossings must be composed of flood-proof materials (Santa Fe County, 1996).

3.2.5 Visual Resources

3.2.5.1 Existing Conditions

The project area is currently undeveloped, with grazing constituting the dominant human impact on the landscape. Colors in the landscape are subtle, dominated by gray-greens and tan-to-brown shades. Tans predominate in winter; gray-greens and tans are intermixed in summer. Generally, shapes are rounded, but linear features such as fencelines and two-track roads add gray and brown horizontal and vertical lines in the landscape. The textural grain is medium, and density is sparse, uneven, and random. The piñon-juniper woodland that is the dominant habitat type in the project area is common in New Mexico. The mature piñon trees in the project area have all died, and dark brown shades have become more dominant.

Scenic Quality field inventories were conducted at key observation points on July 2, 2003, as shown on Figure 3.3. BLM guidelines were utilized to rate the Scenic Quality of the area (BLM 1986a). Visual resources—landforms, vegetation, water, color, adjacent scenery, scarcity, and cultural modification—are scored based on quality and viewer sensitivity. Key observation points in the foreground-middleground zone (within 3–5 miles) were completed at Road Segments 3, 6, 7, and 11. White Rock Overlook was chosen for a background zone (>6 miles) reference. A Scenic Quality rating of 13 was calculated along Road Segments 6 and 7, at the White Rock Overlook, and on the south and east sides of Section 15. This rating is on the bottom end of the B Scenic Quality Classification. Landform, vegetation, color, and adjacent scenery rated medium on the scale. Water rated zero, as no water was present in any of these three areas, and scarcity was rated 1, since piñon-juniper is a common habitat throughout New Mexico. The currently existing two-track in the project area could not be seen from White Rock Overlook. The top of the second story of the existing house in the northern half of Section 13 could be seen only with binoculars. East-facing slopes of the project area could not be seen from White Rock. Road Segments 2 and 3 rated an 11, which is on the high end of C on the Scenic Quality Classification. The rating was lower for this area because a large estate house with dominant oranges and mustard yellows is on a hill east of the road. Neither the colors nor the non-Pueblo architectural form fit into the landscape. The scenic quality as a whole has been degraded by the death of nearly 100 percent of the mature piñon trees in the project area.

The project area is not in a designated right-of-way avoidance area, does not conflict with Class III visual objectives, and is within a designated retention area. The objective of Class III is to partially retain the existing character of the landscape. Moderate changes may occur, should repeat the basic elements found in the predominant natural features of the characteristic landscape, and should not attract attention or dominate the view of the casual observer (BLM,

1986b). Simulations of the change in landscape character as a result of construction along selected road segments are shown in Figures 3.4–3.11.

Very small numbers of people currently use this area for recreation, grazing, or landowner access. When contractor studies were completed on the project area, no people were observed using the area for recreation. None of the attendees at a public meeting held on February 5, 2003, were concerned about visual quality in the project area; they were concerned about increased traffic flow downstream. The area south of the project area is residential, while the project area itself is rural. No special areas such as Natural Areas, Wilderness Areas, Wilderness Study Areas, Wild and Scenic Rivers, Scenic Areas, Scenic Roads or Trails, or Areas of Critical Environmental Concern (ACEC) are present in the project area. The BLM designates the area as semi-primitive. The Taos Resource Management Plan does not identify the visual resource management objectives for the project area, but the fact that two-tracks are common within the area would indicate that the landscape characteristics would most likely fall within visual resource management (VRM) Class III objectives. An ACEC designation has been proposed for the area because of unusual cultural resources assemblages (Santa Fe Northwest Advisory Council, 1998). If an ACEC is established in the area, then there is a high potential for future use (S. Churchill, BLM, personal communication December 2003).

3.2.5.2 Direct Impacts Associated with Alternative A (Road Segments 1, 2, 3, 4, 5, 6, 7)

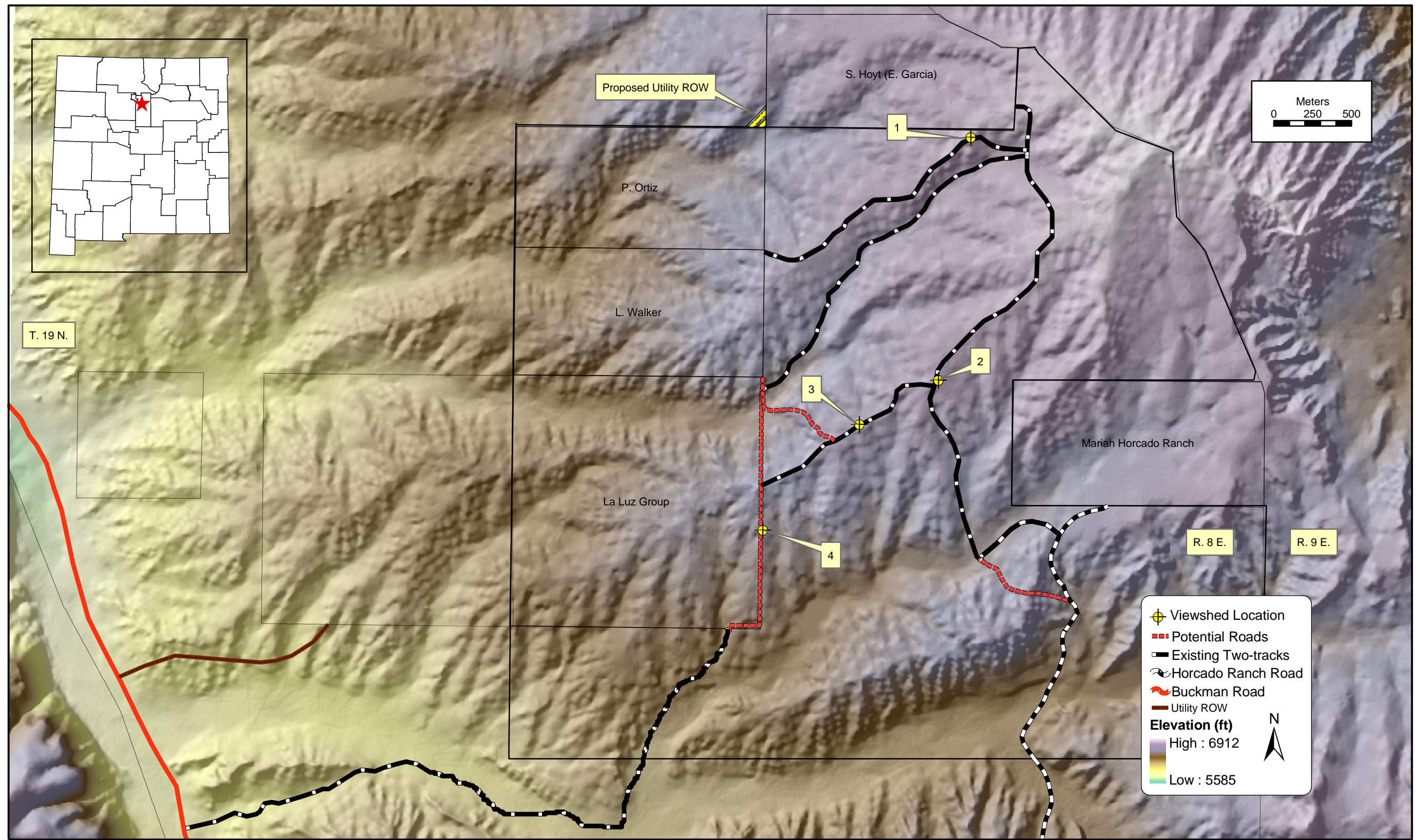
No sensitive receptors (schools, churches, day care centers, hospitals, etc.) are along this route in the project area. One homeowner would be able to see the changed roadway along Segments 2 and 3 from his house. There is currently no roadway at Segment 1. Construction of a 24-foot roadway at this segment may conflict with Class III objectives, since this modification would represent more than a moderate change to the ridge and potentially dominate the skyline.

Construction Term and Roadway Margin Impacts

If Alternative A is implemented, part of the 50-foot right-of-way and 200 feet of 100-foot right-of-way would be cleared of vegetation. In all, up to 22.4 acres would be temporarily changed from an uneven, irregular texture to an even, regular texture. The colors would change from a mixture of tans, grays, browns, and gray-greens to an even tan for the duration of project construction.

Long-Term Roadway Impacts

If Alternative A is implemented, the current roadway on Segments 2–7 would double in width from 12-foot-wide two-track to 24-foot-wide graveled road. Segment 1 would be new road in previously undisturbed terrain. The color of the road would change from the soil color to the color of the gravel. If subdivisions are built, traffic may increase on the road beyond the few people who manage grazing on Jacona Allotments #541 and #542 and who come into the area for recreation. The roadways would increase in size by 7.4 acres. The roadway margins would be a more even tan-to-green color, as grasses would predominate over the trees that are currently in the right-of-way.



Source: BLM/USGS, 2003

SWCA Environmental Consultants, 2004

Figure 3.3. Scenic Quality field inventory locations.



Figure 3.4. Existing road, Segment 3 (Alternatives A, B, C, D, E, G, H).



Figure 3.5. Photo simulation of constructed road, Segment 3 (Alternatives A, B, C, D, E, G, H).



Figure 3.6. Existing road, Segment 6 (Alternatives A, C, E).



Figure 3.7. Photo simulation of constructed road, Segment 6 (Alternatives A, C, E).



Figure 3.8. Existing road, Segment 7 (Alternatives A, C, E, G, H).



Figure 3.9. Photo simulation of constructed road, Segment 7 (Alternatives A, C, E, G, H).



Figure 3.10. Landscape, location of Segment 11 (Alternatives E and F).



Figure 3.11. Photo simulation of constructed road, Segment 11 (Alternatives E and F).

3.2.5.3 Direct Impacts Associated with Alternative B (Road Segments 1, 2, 3, 4, 5, 9)

No sensitive receptors such as churches or schools are along this route in the project area. If Alternative B is implemented, one homeowner would be able to see the changed roadway along Segments 2 and 3 from his house. There is currently no roadway on Segment 1, and construction of Segment 9 would involve multiple arroyo crossings. Construction of a 24-foot roadway at these segments may conflict with Class III objectives, since these modifications would represent more than a moderate change to these features.

Construction Term and Roadway Margin Impacts

If Alternative B is implemented, part of the 50-foot right-of-way and 200 feet of 100-foot right-of-way would be cleared of vegetation. Up to about 19.7 acres would be temporarily changed from an uneven, irregular texture to an even, regular texture. The colors would change from a mixture of tans, grays, browns, and gray-greens to an even tan for the duration of project construction.

Long-Term Roadway Impacts

If Alternative B is implemented, the current roadways on Segments 2–5 and 9 would double in width from 12-foot-wide two-track to 24-foot-wide graveled road. Segment 1 would be new road in previously undisturbed terrain. The color of the road would change from the soil color to the color of the gravel. If subdivisions are built, traffic may increase on the road beyond the few people who manage grazing on Jacona Allotments #541 and #542 and who come into the area for recreation. The roadways would increase in size by 6.6 acres. The roadway margins would be a more even tan-to-green color, as grasses would predominate over the trees that are currently in the right-of-way.

3.2.5.4 Direct Impacts Associated with Alternative C (Road Segments 2, 3, 4, 5, 6, 7, 8)

No sensitive receptors such as churches or schools are along this route in the project area. If Alternative C is implemented, one homeowner would be able to see the changed roadway along Segments 2 and 3 from his house. All construction under this alternative would occur on existing two-tracks.

Construction Term and Roadway Margin Impacts

If Alternative C is implemented, part of the 50-foot right-of-way would be cleared of vegetation. Up to about 21.3 acres would be temporarily changed from an uneven, irregular texture to an even, regular texture. The colors would change from a mixture of tans, grays, browns, and gray-greens to an even tan for the duration of project construction.

Long-Term Roadway Impacts

If Alternative C is implemented, the current roadway on Segments 2–8 would double in width from 12-foot-wide two-track to 24-foot-wide graveled road. The color of the road would change from the soil color to the color of the gravel. If subdivisions are built, traffic may increase on the road beyond the few people who manage grazing on Jacona Allotments #541 and #542 and who

come into the area for recreation. The roadways would increase in size by 6.7 acres. The roadway margins would be a more even tan-to-green color, as grasses would predominate over the trees that are currently in the right-of-way.

3.2.5.5 Direct Impacts Associated with Alternative D (Road Segments 2, 3, 4, 5, 8, 9)

No sensitive receptors such as churches or schools are along this route in the project area. If Alternative D is implemented, one homeowner would be able to see the changed roadway along Segments 2 and 3 from his house. All of the construction would occur on existing two-tracks. Construction of Segment 9 would involve multiple arroyo crossings. Construction of a 24-foot roadway at this segment may conflict with Class III objectives, since this modification would represent more than a moderate change to these features.

Construction Term and Roadway Margin Impacts

If Alternative D is implemented, part of the 50-foot right-of-way would be cleared of vegetation. Up to approximately 18.6 acres would be temporarily changed from an uneven, irregular texture to an even, regular texture. The colors would change from a mixture of tans, grays, browns, and gray-greens to an even tan color for the duration of project construction.

Long-Term Roadway Impacts

If Alternative D is implemented, the current roadway on Segments 2–5, 8, and 9 would double in width from 12-foot-wide two-track to 24-foot-wide graveled road. The color of the road would change from the soil color to the color of the gravel. If subdivisions are built, traffic may increase on the road beyond the few people who manage grazing on Jacona Allotments #541 and #542 and who come into the area for recreation. The roadways would increase in size by 5.9 acres. The roadway margins would be a more even tan-to-green color, as grasses would predominate over the trees that are currently in the right-of-way.

3.2.5.6 Direct Impacts Associated with Alternative E (Road Segments 3, 4, 5, 6, 7, 10, 11)

No sensitive receptors such as churches or schools are along this route in the project area. If Alternative E is implemented, one homeowner would be able to see the changed roadway at Segments 2 and 3 from his house. New construction would occur at Road Segment 11. Construction of a 24-foot roadway at this segment may conflict with Class III objectives, since this modification would represent more than a moderate change to the ridge and potentially dominate the skyline.

Construction Term and Roadway Margin Impacts

If Alternative E is implemented, part of the 50-foot-wide right-of-way would be cleared of vegetation. Up to about 37.8 acres would be temporarily changed from an uneven, irregular texture to an even, regular texture. The colors would change from a mixture of tans, grays, browns, and gray-greens to an even tan for the duration of project construction.

Long-Term Roadway Impacts

If Alternative E is implemented, the current roadway on Segments 3–7 and 10 would double in width from 12-foot-wide two-track to 24-foot-wide graveled road. The color of the road would change from the soil color to the color of the gravel. If subdivisions are built, traffic may increase on the road beyond the few people who manage grazing on Jacona Allotments #541 and #542 and who come into the area for recreation. New road would be built on previously undisturbed terrain on Segment 11. Construction of a 24-foot roadway at this segment may conflict with Class III objectives, since this modification would represent more than a moderate change to the ridge and potentially dominate the skyline. The new linear feature would add gravel over 11.3 acres of soil. The roadway margins would be a more even tan-to-green color, as grasses would predominate over the trees that are currently in the right-of-way.

3.2.5.7 Direct Impacts Associated with Alternative F (Road Segments 4, 5, 9, 10, 11, 12)

No sensitive receptors such as churches or schools are present from which the roadway could be seen along Alternative F within the project area.

Construction Term and Roadway Margin Impacts

If Alternative F is implemented, part of the 50-foot-wide right-of-way would be cleared of vegetation. Up to about 34.3 acres would be temporarily changed from an uneven, irregular texture to an even, regular texture. The colors would change from a mixture of tans, grays, browns, and gray-greens to an even tan for the duration of project construction.

Long-Term Roadway Impacts

If Alternative F is implemented, the current roadway on Segments 4, 5, 9, and 10 would double in width from 12-foot-wide two-track to 24-foot-wide graveled road. The color of the road would change from the soil color to the color of the gravel. If subdivisions are built, traffic may increase on the road beyond the few people who manage grazing on Jacona Allotments #541 and #542 and who come into the area for recreation. New road would be built at Segments 11 and 12. Construction of a 24-foot roadway at these segments may conflict with Class III objectives, since this modification would represent more than a moderate change to the ridge and potentially dominate the skyline. The new linear feature would add gravel over 9.8 acres of soil. The roadway margins would be a more even tan-to-green color, as grasses would predominate over the trees that are currently in the right-of-way.

3.2.5.8 Direct Impacts Associated with Alternative G (Road Segments 1, 2, 3, 4, 5, east half of 7, 13)

No sensitive receptors such as churches or schools are along this route in the project area. If Alternative G is implemented, one homeowner would be able to see the changed roadway along Segments 2 and 3 from his house. There is currently no roadway on Segment 1 or 13, and a major arroyo would be crossed by Segment 13. Construction of 24-foot roadway at Segments 1 and 13 and the arroyo crossing at Segment 13 may conflict with Class III objectives, since these modifications would represent more than a moderate change to these features.

Construction Term and Roadway Margin Impacts

If Alternative G is implemented, part of the 50-foot right-of-way and 200 feet of 100-foot right-of-way would be cleared of vegetation. Up to about 17.7 acres would be temporarily changed from an uneven, irregular texture to an even, regular texture. The colors would change from a mixture of tans, grays, browns, and gray-greens to an even tan for the duration of project construction.

Long-Term Roadway Impacts

If Alternative G is implemented, the current roadway on Segments 2–5 and on the east half of Segment 7 would double in width from 12-foot-wide two-track to 24-foot-wide graveled road. Segments 1 and 13 would be new 24-foot-wide road on previously undisturbed land. The color of the road would change from the soil color to the color of the gravel. If subdivisions are built, traffic may increase on the road beyond the few people who manage grazing on Jacona Allotments #541 and #542 and who come into the area for recreation. The roadways would cover 6.4 acres. The roadway margins would be a more even tan-to-green color, as grasses would predominate over the trees that are currently in the right-of-way.

3.2.5.9 Direct Impacts Associated with Alternative H (Road Segments 2, 3, 4, 5, east half of 7, 8, 13)

No sensitive receptors such as churches or schools are along this route in the project area. If Alternative H is implemented, one homeowner would be able to see the changed roadway along Segments 2 and 3 from his house. Construction of Segment 13 would involve a major arroyo crossing. Construction of new 24-foot roadway and the major arroyo crossing at Segment 13 may conflict with Class III objectives, since these modifications would represent more than a moderate change to these features.

Construction Term and Roadway Margin Impacts

If Alternative H is implemented, part of the 50-foot right-of-way would be cleared of vegetation. Up to approximately 16.7 acres would be temporarily changed from an uneven, irregular texture to an even, regular texture. The colors would change from a mixture of tans, grays, browns and gray-greens to an even tan color for the duration of project construction.

Long-Term Roadway Impacts

If Alternative H is implemented, the current roadway on Segments 2–5 and on the east half of Segment 7 would double in width from 12-foot-wide two-track to 24-foot-wide graveled road. Segment 13 would be new road on previously undisturbed land. The color of the road would change from the soil color to the color of the gravel. If subdivisions are built, traffic may increase on the road beyond the few people who manage grazing on Jacona Allotments #541 and #542 and who come into the area for recreation. The roadways would cover 5.7 acres. The roadway margins would be a more even tan-to-green color, as grasses would predominate over the trees that are currently in the right-of-way.

3.2.5.10 Secondary Impacts Common to Horcado Ranch Road Access Alternatives (Alternatives A, B, C, D, G, H)

Increased traffic may occur on Camino la Tierra, Paseo de la Tierra, Estrada Calabasa, and Horcado Ranch Road as a result of subdivision of the private properties on Sections 2, 10, and 15 once legal access is acquired. The associated movement of vehicles on the road would increase the variety of colors and textures present. Activity patterns would not change as a result of potential subdivision development. Workers would commute in to build on properties, residents would commute out to go to work. These same activities are presently occurring; the only change would be in the frequency of the activity.

3.2.5.11 Secondary Impacts Common to Buckman Road Access Alternatives (Alternatives E and F)

Increased traffic may occur on Camino la Tierra and Buckman Road as a result of subdivision of the private properties on Sections 2, 10, and 15 once legal access is acquired. The variety of colors and textures associated with the movement of vehicles on the road would increase. Currently there are no subdivisions along Buckman Road. The only vehicles on the road are driven by recreationists and well-maintenance workers. Activity patterns would change as a result of potential subdivision development. Workers would commute in to build on the private properties, residents would commute out to go to work. Potential traffic increase that could result from residences being built on the private properties is discussed in Section 3.2.7.

3.2.5.12 Direct Impacts Associated with Alternative I (the No Action Alternative)

If Alternative I is implemented, there would be no changes to the roads. Visual resources would remain unchanged.

3.2.5.13 Comparison of Action Alternatives

One homeowner lives on the ridgetop east of road Segments 2 and 3. Implementation of Alternative A, B, C, D, E, G, or H could minimally impact the homeowner's visual resources due to traffic traveling along the Segment 2 and 3 roads. Alternative F would not use Segment 2, but the road could be visible to the homeowner from Segment 3. No sensitive receptors such as churches or schools are present in the project area. Communities to the south of the project area would be visually impacted by changes from increased traffic under either the Horcado Ranch Road alternatives or the Buckman Road Access alternatives. Under the Horcado Ranch Road alternatives, visual resources would be impacted through the communities of Las Campañas and La Tierra. Under the Buckman Road Access alternatives, visual resources would be impacted through the communities of Las Campañas and La Tierra Nueva. The impacts would include an increase in the amount and frequency of traffic. Potential traffic increase is discussed in Section 3.2.7.

The roadway in Alternatives A, C, E, G, and H, which includes Segments 6 and/or 7, runs along ridgetops. These roads would not be any more visible than Road Segment 9 in Alternatives B, D, and F, because the ridgetops are in woodlands that would hide any passing traffic from the view of observers who were not standing right by the road. There are no foreground or middleground vantage points that are high enough that observers would look directly down on Road Segments

6 and 7, including those traveling on Segments 3 and 4. Details of the project area cannot be seen from the White Rock Overlook, a background vantage point, without binoculars.

3.2.5.14 Connected Action

If development occurs on any of the four parcels to be accessed, additional impact to visual resources may result from construction of houses and roads under all of the Action Alternatives. Disturbance would be in the form of a change to shape, texture, and/or color. Change in shape would be from rounded forms to geometric forms. Change in texture would be from a medium to a coarser texture. Change in color would be from smaller color patches to larger color patches. The Santa Fe Land Development Code requires that artificial features not be placed on the tops of hills and that the colors blend in with surrounding landscape colors. Following this code would mitigate the impact of development on visual resources. Up to 2.6% of the land area, under the maximum possible subdivision scenario, could be affected by these changes. The amount of visual resource impact would depend on the density of any subdivision of the properties. The density of subdivision will be determined by the owners, the terrain, and State of New Mexico and Santa Fe County laws and ordinances. The likelihood and density of the potential subdivision of the properties is discussed in Section 3.8.1, Secondary and Cumulative Effects.

3.2.6 Air Quality and Noise

3.2.6.1 Existing Conditions

The air quality monitoring station closest to the proposed project area is in Santa Fe. All of Santa Fe County is considered to be in attainment with all State and Federal air quality standards for carbon monoxide, nitrogen dioxide, sulfur dioxide, ozone, lead, and suspended particulates smaller than 10 microns (EPA, 2002).

The project area is designated by the BLM as Semi-Primitive Non-Motorized in the Taos Resource Management Plan (BLM, 1988). There are no developed recreation resources in the project area. The BLM is adopting 48.6 dB over a 24-hour period at 300 feet distance in all directions from the sights and sounds of human activity as the requirement in Semi-Primitive Non-Motorized areas, based on studies conducted for oil and gas in the Farmington Field Office (T. Torres, BLM, personal communication 19 August 2003). In residential areas the EPA requires an average noise level of 55 dBA or lower, or 48.6 dBA for facilities that operate at a constant level of noise (EPA, 1974).

Currently, there is little or no traffic noise in the proposed project area. Little or no additional traffic noise is contributed by vehicles on the private properties that would be serviced by the proposed roads. The current noise level probably fluctuates between 20 and 30 dB (EPA, 1974). Current noise levels are generally the same throughout the project area. Infrequent traffic noise may be heard at the existing two-track (Segment 8) that enters the project area from Horcado Ranch Road and where the existing two-track (Segment 10) enters the project area at Buckman Road.

3.2.6.2 Direct Impacts Associated with Alternative A (Road Segments 1, 2, 3, 4, 5, 6, 7)

Construction Term and Roadway Margin Impacts

If Alternative A is implemented, fugitive dust and vehicle exhaust emissions would be generated during construction of the road segments. Soils could be stirred along roadway margins during clearing and grubbing operations and cause temporary fugitive dust emissions. Roads would be sprayed with water during construction to mitigate fugitive dust. Dirt stockpiles would be watered down or covered. Approximately 22.4 acres of soil would be exposed to wind erosion during the construction of the Alternative A route.

Noise levels produced by construction will not change during the construction term as a result of the various alternatives, as different types of construction activities would not vary widely in the amount of noise they would produce. Noise levels are discussed under Impacts Common to Horcado Ranch Road Access Alternatives, Section 3.2.6.6.

Long-Term Roadway Impacts

If Alternative A is implemented, 7.4 acres of road would be covered by gravel. Some fugitive dust would result from soil picked up by tires as vehicles travel the road after construction is finished. This effect would be minimized by maintenance of the gravel base that covers the road. The number of cars in the area could increase, which would increase the level of exhaust emissions in the area, but the increase would be negligible (a maximum 0.3% increase in the Santa Fe air quality basin; based on maximum traffic increase from 12.5-acre lot subdivision divided by the total population of Santa Fe County times 5.5 trips/day) in comparison to the total amount of exhaust emissions produced by traveling vehicles in Santa Fe County.

Noise levels are similar for Alternatives A–H. Noise levels over the long term are discussed under Impacts Common to Horcado Ranch Road Access Alternatives, Section 3.2.6.6.

3.2.6.3 Direct Impacts Associated with Alternative B (Road Segments 1, 2, 3, 4, 5, 9)

Construction Term and Roadway Margin Impacts

If Alternative B is implemented, fugitive dust and exhaust emissions would be generated during construction of the road segments. Soils could be stirred along roadway margins during clearing and grubbing operations and cause temporary fugitive dust. Roads would be sprayed with water during construction to mitigate fugitive dust. Dirt stockpiles would be watered down or covered. Approximately 19.7 acres of soil would be exposed to wind erosion during the construction of the Alternative B route.

Noise levels produced by construction will not change during the construction term as a result of the various alternatives, as different types of construction activities would not vary widely in the amount of noise they would produce. Noise levels are discussed in Section 3.2.6.6, Impacts Common to Horcado Ranch Road Access Alternatives.

Long-Term Roadway Impacts

If Alternative B is implemented, 6.6 acres of road would be covered by gravel. Some fugitive dust would result from soil picked up by tires as vehicles travel the road after construction is finished. This effect would be minimized by maintenance of the gravel base that covers the road. The number of cars in the area could increase, which would increase the level of exhaust emissions in the area. The increase would be negligible (a maximum 0.3% increase in the Santa Fe air quality basin; based on maximum traffic increase from 12.5-acre lot subdivision divided by the total population of Santa Fe County times 5.5 trips/day) in comparison to the total amount of exhaust emissions produced by traveling vehicles in Santa Fe County.

Noise levels are similar for Alternatives A–H. Noise levels over the long term are discussed under Impacts Common to Horcado Ranch Road Access Alternatives, Section 3.2.6.6.

3.2.6.4 Direct Impacts Associated with Alternative C (Road Segments 2, 3, 4, 5, 6, 7, 8)

Construction Term and Roadway Margin Impacts

If Alternative C is implemented, fugitive dust and exhaust emissions would be generated during construction of the road segments. Soils could be stirred along roadway margins during clearing and grubbing operations and cause temporary dust emissions. Roads would be sprayed with water during construction to mitigate fugitive dust. Dirt stockpiles would be watered down or covered. Approximately 21.3 acres of soil would be exposed to wind erosion during the construction of the Alternative C route.

Noise levels produced by construction will not change during the construction term as a result of the various alternatives, as different types of construction activities would not vary widely in the amount of noise they would produce. Noise levels are discussed under Impacts Common to Horcado Ranch Road Access Alternatives, Section 3.2.6.6.

Long-Term Roadway Impacts

If Alternative C is implemented, 6.7 acres of road would be covered by gravel. Some fugitive dust would result from soil picked up by tires as vehicles travel the road after construction is finished. This effect would be minimized by maintenance of the gravel base that covers the road. The number of cars in the area could increase, which would increase the level of exhaust emissions in the area. The increase would be negligible (a maximum 0.3% increase in the Santa Fe air quality basin; based on maximum traffic increase from 12.5-acre lot subdivision divided by the total population of Santa Fe County times 5.5 trips/day) in comparison to the total amount of exhaust emissions produced by traveling vehicles in Santa Fe County.

Noise levels are similar for Alternatives A–H. Noise levels over the long term are discussed under Impacts Common to Horcado Ranch Road Access Alternatives, Section 3.2.6.6.3.2.6.5 Direct Impacts Associated with Alternative D (Road Segments 2, 3, 4, 5, 8, 9)

Construction Term and Roadway Margin Impacts

If Alternative D is implemented, fugitive dust would be generated during construction of the road segments. Soils could be stirred along roadway margins during clearing and grubbing operations and cause temporary dust emissions. Roads would be sprayed with water during construction to mitigate fugitive dust. Dirt stockpiles would be watered down or covered.

Approximately 18.6 acres of soil would be exposed to wind erosion during the construction of the Alternative D route.

Noise levels produced by construction will not change during the construction term as a result of the various alternatives, as different types of construction activities would not vary widely in the amount of noise they would produce. Noise levels are discussed under Impacts Common to Horcado Ranch Road Access Alternatives, Section 3.2.6.6.

Long-Term Roadway Impacts

If Alternative D is implemented, 5.9 acres of road would be covered by gravel. Some fugitive dust and vehicle exhaust emissions would result from vehicles traveling the road after construction is finished. Fugitive dust would be minimized by maintenance of the gravel base that covers the road. The number of cars in the area could increase, which would increase the level of exhaust emissions in the area. The increase would be negligible (a maximum 0.3% increase in the Santa Fe air quality basin; based on maximum traffic increase from 12.5-acre lot subdivision divided by the total population of Santa Fe County times 5.5 trips/day) in comparison to the total amount of exhaust emissions produced by traveling vehicles in Santa Fe County.

Noise levels are similar for Alternatives A–H. Noise levels over the long term are discussed under Impacts Common to Horcado Ranch Road Access Alternatives, Section 3.2.6.6.

3.2.6.6 Direct Impacts Associated with Alternative E (Road Segments 3, 4, 5, 6, 7, 10, 11)

Construction Term and Roadway Margin Impacts

If Alternative E is implemented, fugitive dust and exhaust emissions would be generated during construction of the road segments. Soils could be stirred along roadway margins during clearing and grubbing operations and cause temporary dust emissions. Roads would be sprayed with water during construction to mitigate fugitive dust. Dirt stockpiles would be watered down or covered. Approximately 37.8 acres of soil would be exposed to wind erosion during the construction of the Alternative E route.

Noise levels produced by construction will not change during the construction term as a result of the various alternatives, as different types of construction activities would not vary widely in the amount of noise they would produce. Noise levels are discussed in Section 3.2.6.9, Impacts Common to Buckman Road Access Alternatives.

Long-Term Roadway Impacts

If Alternative E is implemented, 11.3 acres of road would be covered by gravel. Some fugitive dust emissions would result from soil picked up by tires as vehicles travel the road after construction is finished. This effect would be minimized by maintenance of the gravel base that covers the road. The number of cars in the area could increase, which would increase the level of exhaust emissions in the area. The increase would be negligible (a maximum 0.3% increase in the Santa Fe air quality basin; based on maximum traffic increase from 12.5-acre lot subdivision

divided by the total population of Santa Fe County times 5.5 trips/day) in comparison to the total amount of exhaust emissions produced by traveling vehicles in Santa Fe County.

Noise levels are similar for Alternatives A–H. Noise levels over the long term are discussed under Impacts Common to Buckman Road Access Alternatives, Section 3.2.6.9.

3.2.6.7 Direct Impacts Associated with Alternative F (Road Segments 4, 5, 9, 10, 11, 12)

Construction Term and Roadway Margin Impacts

If Alternative F is implemented, fugitive dust and exhaust emissions would be generated during construction of the road segments. Soils could be stirred along roadway margins during clearing and grubbing operations and cause temporary dust emissions. Roads would be sprayed with water during construction to mitigate fugitive dust. Dirt stockpiles would be watered down or covered. Approximately 34.3 acres of soil would be exposed to wind erosion during the construction of the Alternative F route.

Noise levels produced by construction will not change during the construction term as a result of the various alternatives, as different types of construction activities would not vary widely in the amount of noise they would produce. Noise levels are discussed in Section 3.2.6.9, Impacts Common to Buckman Road Access Alternatives.

Long-Term Roadway Impacts

If Alternative F is implemented, 9.8 acres of road would be covered by gravel. Some fugitive dust emissions would result from soil picked up by tires as vehicles travel the road after construction is finished. This effect would be minimized by maintenance of the gravel base that covers the road. The number of cars in the area could increase, which would increase the level of exhaust emissions in the area. The increase would be negligible (a maximum 0.3% increase in the Santa Fe air quality basin; based on maximum traffic increase from 12.5-acre lot subdivision divided by the total population of Santa Fe County times 5.5 trips/day) in comparison to the total amount of exhaust emissions produced by traveling vehicles in Santa Fe County.

Noise levels are similar for Alternatives A–H. Noise levels over the long term are discussed under Impacts Common to Buckman Road Access Alternatives, Section 3.2.6.9.

3.2.6.8 Direct Impacts Associated with Alternative G (Road Segments 1, 2, 3, 4, 5, east half of 7, 13)

Construction Term and Roadway Margin Impacts

If Alternative G is implemented, fugitive dust and exhaust emissions would be generated during construction of the road segments. Soils could be stirred along roadway margins during clearing and grubbing operations and cause temporary fugitive dust. Roads would be sprayed with water during construction to mitigate fugitive dust. Dirt stockpiles would be watered down or covered. Approximately 17.7 acres of soil would be exposed to wind erosion during the construction of the Alternative G route.

Noise levels produced by construction will not change during the construction term as a result of the various alternatives, as different types of construction activities would not vary widely in the amount of noise they would produce. Noise levels are discussed in the section on Impacts Common to Horcado Ranch Road Access Alternatives, Section 3.2.6.6.

Long-Term Roadway Impacts

If Alternative G is implemented, 6.4 acres of road would be covered by gravel. Some fugitive dust would result from soil picked up by tires as vehicles travel the road after construction is finished. This effect would be minimized by maintenance of the gravel base that covers the road. The number of cars in the area could increase, which would increase the level of exhaust emissions in the area. The increase would be negligible (a maximum 0.3% increase in the Santa Fe air quality basin; based on maximum traffic increase from 12.5-acre lot subdivision divided by the total population of Santa Fe County times 5.5 trips/day) in comparison to the total amount of exhaust emissions produced by traveling vehicles in Santa Fe County.

Noise levels are similar for Alternatives A–H. Noise levels over the long term are discussed under Impacts Common to Horcado Ranch Road Access Alternatives, Section 3.2.6.6.

3.2.6.9 Direct Impacts Associated with Alternative H (Road Segments 2, 3, 4, 5, east half of 7, 8, 13)

Construction Term and Roadway Margin Impacts

If Alternative H is implemented, fugitive dust would be generated during construction of the road segments. Soils could be stirred along roadway margins during clearing and grubbing operations and cause temporary dust emissions. Roads would be sprayed with water during construction to mitigate fugitive dust. Dirt stockpiles would be watered down or covered. Approximately 16.7 acres of soil would be exposed to wind erosion during the construction of the Alternative H route.

Noise levels produced by construction will not change during the construction term as a result of the various alternatives, as different types of construction activities would not vary widely in the amount of noise they would produce. Noise levels are discussed under Impacts Common to Horcado Ranch Road Access Alternatives, Section 3.2.6.6.

Long-Term Roadway Impacts

If Alternative H is implemented, 5.7 acres of road would be covered by gravel. Some fugitive dust and vehicle exhaust emissions would result from vehicles traveling the road after construction is finished. Fugitive dust would be minimized by maintenance of the gravel base that covers the road. The number of cars in the area could increase, which would increase the level of exhaust emissions in the area. The increase would be negligible (a maximum 0.3% increase in the Santa Fe air quality basin; based on maximum traffic increase from 12.5-acre lot subdivision divided by the total population of Santa Fe County times 5.5 trips/day) in comparison to the total amount of exhaust emissions produced by traveling vehicles in Santa Fe County.

Noise levels are similar for Alternatives A–H. Noise levels over the long term are discussed under Impacts Common to Horcado Ranch Road Access Alternatives, Section 3.2.6.6.

3.2.6.10 Secondary Impacts Common to Horcado Ranch Road Access Alternatives (Alternatives A, B, C, D, G, H)

Dust and vehicle exhaust emissions would be generated by construction equipment along the unpaved portion of Horcado Ranch Road during the construction term. Over the long term, fugitive dust would be generated by additional cars traveling on the unpaved portion of Horcado Ranch Road. The 13 houses that can be seen from the unpaved portion of Horcado Ranch Road are not directly adjacent to the road. As shown in a 1996 DOQQ USGS aerial map, the closest house is about 500 feet from the road. SWCA field personnel found in March 2004 that no houses have been built closer to the road since the aerial photograph was taken. Fugitive dust and exhaust emissions should have a minimal effect on people inside their residences, since houses are not directly adjacent to the road. Existing subdivisions are off of Paseo de la Tierra and the paved portion of Estrada Calabasa.

Traffic creates a fluctuating noise level that varies from hour to hour and between day and night. Residential traffic will peak during the rush hours and fall dramatically between rush hours and after 7 p.m. The L_{dn} (average day-night sound level decibels) in small town and quiet suburban areas is 52. The L_{dn} in a tomato field on a farm is 44 (EPA, 1974). Given the level of possible development and that the traffic levels in the project area would be from cars traveling through, with no additional noise contributed by activities at houses, the L_{dn} would probably fall between 44 and 52 dB. This noise level would not exceed the standard set for BLM Semi-Primitive Non-Motorized Areas.

The traffic noise levels on Horcado Ranch Road would not increase substantially, as traffic is already present at rural-residential levels. Traffic counts are given in Section 3.2.7. Construction of new houses is taking place at undeveloped lots within the subdivisions that already exist, so construction traffic and dump truck noise should not vary significantly from what already exists.

3.2.6.11 Secondary Impacts Common to Buckman Road Access Alternatives (Alternatives E and F)

Dust and vehicle exhaust emissions would be generated by construction equipment along the unpaved portion of Buckman Road during the construction term. The nine houses that can be seen from the unpaved portion of Buckman Road are not directly adjacent to the road. As shown in a 1996 DOQQ USGS aerial map, the closest of the houses is about 300 feet from the unpaved portion of Buckman Road. SWCA field personnel found in March 2004 that no houses have been built closer to the road since the aerial photograph was taken. Fugitive dust and exhaust emissions should have a minimal affect on people within their residences, since the houses are not directly adjacent to the road. Traffic counts are given in Section 3.2.7. Subdivisions along this route are on the paved section of Camino la Tierra.

Traffic creates a fluctuating noise level that varies from hour to hour and between day and night. Residential traffic will peak during the rush hours and fall dramatically between rush hours and

after 7 p.m. The L_{dn} (average day-night sound level decibels) in small town and quiet suburban areas is 52. The L_{dn} in a tomato field on a farm is 44 (EPA, 1974). Given the level of possible development and that the traffic levels in the project area would be those of cars traveling through, with no additional noise contributed by activities at houses, the L_{dn} would probably fall between 44 and 52 dB. This noise level would not exceed the standard set for BLM Semi-Primitive Non-Motorized Areas.

The traffic noise levels at Buckman Road would not increase substantially, as traffic is already present from maintenance traffic for wells, from recreationists, and from rural residential use. Traffic counts for Buckman Road are provided in Section 3.2.7. Construction of new houses is taking place at undeveloped lots within the subdivisions that already exist, so construction traffic and dump truck noise should not vary significantly from what already exists.

3.2.6.12 Direct Impacts Associated with Alternative I (the No Action Alternative)

If Alternative I is implemented, no additional fugitive dust, vehicle exhaust emissions, or noise would be generated by construction or additional traffic along the chosen routes. There would be no impact to air quality or noise as a result of this alternative.

3.2.6.13 Comparison of Action Alternatives

Alternatives E and F would expose the most soil (37.8 acres and 24.3 acres, respectively) to wind erosion during the construction term before completion of revegetation. The smallest amount of soil exposure (16.7 acres) would occur under Alternative H. Disturbance acreage may change slightly if the road along the chosen alternative is redesigned to lessen impacts on the topography. The impact of noise levels over the construction term would be equal among the various alternatives, as the rate of construction would remain the same.

Alternatives A, C, and E would be equal in terms of potential fugitive dust emissions and noise over the long term, as the density of land development would potentially be the same for these alternatives. Under Alternatives B, D, F, G, and H, where only one road would serve the properties in Sections 10 and 15, the potential density of land development would not be as high because of Santa Fe County Land Development code requirements. A discussion of the different possible land development scenarios is in Section 3.8.

3.2.6.14 Connected Action

Additional impacts to air quality and noise may result from construction of house pads and roads on the four parcels to be served by the access roads proposed under Alternatives A–H. The amount of air quality or noise impact would depend on the density of any subdivision of the properties. At the maximum possible level of housing density (one residence per 12.5 acres), approximately 2.6% of the land area of the private lands would be exposed to wind and soil erosion during construction (3 miles of road and 0.25 acre for house and driveway development). Once housing construction is finished, the soils would be stabilized by landscaping, buildings, and graveled roads. The density of subdivision would be determined by the owners, the terrain, and State of New Mexico and Santa Fe County laws and ordinances. The likelihood and density

of the potential subdivision of the properties is discussed in Section 3.8.1, Secondary and Cumulative Effects.

3.2.7 Traffic

3.2.7.1 Existing Conditions

The project area is rural and is currently used only by people who are managing cattle grazing on BLM lands or who use those lands for recreation. Horcado Ranch Road and Buckman Road are low-volume routes that provide access to BLM, Forest Service, and private lands. Buckman Road is used for maintenance of the Buckman Wells and other utility company facilities. Horcado Ranch Road is used for access to 10 rural residences. The Santa Fe Regional Transportation Model 2000 (Pitts, 2002) reports that each non-urban single-family home generates an average of 5.5 trips per day.

Traffic has been counted and characterized along Buckman Road just north of Dead Dog Well. The traffic counter average is 12 vehicles/day on weekdays and 54 vehicles/day on weekends (Table 3.5). TetraTech (Tierra LopezGarcia Group, 2003) also conducted a manned study on Tuesday, August 27th, 2002, and Sunday, September 15, 2002. Recorded observations included the number of people in the car, the reason for traveling on Buckman Road, the direction of travel, and the state of origin of the vehicle. On Tuesday, the first day of the study, 10 cars traveled along Buckman Road for recreational purposes and 12 for work. All cars but one had an in-state license plate. On Sunday, 25 cars traveled the road for recreational purposes, 17 were leaving the area, and 2 were working (Tierra LopezGarcia Group, 2003). Three of these 44 cars bore out-of-state license plates.

Traffic counts were conducted along Horcado Ranch Road on Thursday, January 22, and Saturday, January 31, 2004, between 6:30 a.m. and 5:30 p.m. about 0.25 mile west of Paseo de la Tierra. On January 22, 120 cars and trucks used the road. Of these, about 45 appeared to be work trucks. Most of the workers were employed on construction projects at Mariah Ranch. The rest of the vehicles were residents. On January 31, 38 cars or trucks used the road. About seven of these were workers and 31 were residents or visitors. A June 1998 Santa Fe Northwest Advisory Council (SNAC) newsletter stated that Horcado Ranch Road averages approximately 80 trips per day.

Table 3.5. Vehicle Counter Record

Date of Reading	Time of Reading	Days of Count	Counter Reading
9/9/02	8:42 am	Friday (9/6 evening) – Sunday (9/8)	46
9/10/02	8:54 am	Monday (9/9)	6
9/11/02	9:17 am	Tuesday (9/10)	8
9/12/02	9:01 am	Wednesday (9/11)	19
9/13/02	8:43 am	Thursday (9/12)	20
9/13/02	10:15 pm	Friday (9/13)	11
9/16/02	9:06 pm	Saturday (9/14) – Sunday (9/15)	89
9/20/02	5:38 pm	Monday (9/16) – Friday (9/20)	139
9/23/02	8:58 pm	Saturday (9/28) – Sunday (9/22)	92
9/27/02	2:51 pm	Monday (9/23) – Friday (9/27)	77
9/30/02	8:55 pm	Saturday (9/28) – Sunday (9/29)	129 (Public Lands Clean-up Day)
10/4/02	4:09 pm	Monday (9/30) – Friday (10/4)	102
10/7/02	12:00 pm	Saturday (10/5) – Mon (10/7 noon)	131

Current road conditions for travel on existing two-tracks in the project area are poor. All of the road segments, with the exception of Segment 7, are passable only with four-wheel-drive vehicles when dry and cannot be safely used when wet. The northeast end of the two-track where Road Segment 7 is connected to Segments 2 and 3 is currently unusable, as the road has been washed out.

3.2.7.2 Direct Impacts Associated with Alternative A (Road Segments 1, 2, 3, 4, 5, 6, 7)

Construction Term and Roadway Margin Impacts

If Alternative A is implemented, construction vehicles would be traveling to and from the construction area. These vehicles will include a bulldozer, scraper, motor grader, compactor, and water truck. A backhoe may also be needed for trenching. Trucks will deliver CMP culverts and other building materials. About 14,000 tons of gravel will be delivered to the site to surface 4.7 miles of road. If dump trucks carry 25 tons of gravel per load, then over the life of the project about 560 dump-truck loads of gravel would be transported on area roads. The work force would vary, averaging four workmen and one foreman per day. Vehicles would be parked within the right-of-way on the road sections previously built or in a Temporary Use Area. The road construction term would be approximately 209 working days. In all, the workers' commute and gravel trucks would add up to 16 trips/day (Walbridge, 2001).

Long-Term Roadway Impacts

If Alternative A is implemented, traffic rates on roadways would depend on the number of residences built on the private lands if the properties are subdivided. Traffic counts would not change by alternative. Potential counts are listed below under Impacts Common to Horcado Ranch Road Access Alternatives, Section 3.2.7.10.

3.2.7.3 Direct Impacts Associated with Alternative B (Road Segments 1, 2, 3, 4, 5, 9)

Construction Term and Roadway Margin Impacts

If Alternative B is implemented, construction vehicles would be traveling to and from the construction area. These vehicles will include a bulldozer, scraper, motor grader, compactor, and water truck. A backhoe may also be needed for trenching. Trucks will deliver CMP culverts and other building materials. About 12,153 tons of gravel will be delivered to the site to surface 4.08 miles of road. If semi-sized dump trucks carry 25 tons of gravel per load, then over the life of the project about 486 dump-truck loads of gravel would be transported on area roads. The work force would vary, averaging four workmen and one foreman per day. Vehicles would be parked within the right-of-way on the road sections previously built or in a Temporary Use Area. The road construction term would be approximately 181 working days. In all, the workers' commute and gravel trucks would add up to approximately 16 trips/day (Walbridge, 2001).

Long-Term Roadway Impacts

If Alternative B is implemented, traffic rates on roadways would depend on the number of residences built on the private lands if the properties are subdivided. Traffic counts would not change by alternative. The counts are listed below under Impacts Common to Horcado Ranch Road Access Alternatives, Section 3.2.7.10.

3.2.7.4 Direct Impacts Associated with Alternative C (Road Segments 2, 3, 4, 5, 6, 7, 8)

Construction Term and Roadway Margin Impacts

If Alternative C is implemented, construction vehicles would be traveling to and from the construction area. These vehicles will include a bulldozer, scraper, motor grader, compactor, and water truck. A backhoe may also be needed for trenching. Trucks will deliver CMP culverts and other building materials. About 13,791 tons of gravel will be delivered to the site to surface 4.63 miles of road. If semi-sized dump trucks carry 25 tons of gravel per load, then over the life of the project about 552 dump-truck loads of gravel would be transported on area roads. The work force would vary, averaging four workmen and one foreman per day. Vehicles would be parked within the right-of-way on the road sections previously built or in a Temporary Use Area. The road construction term would be approximately 206 working days. In all, the workers' commute and gravel trucks would add up to 16 trips/day (Walbridge, 2001).

Long-Term Roadway Impacts

If Alternative C is implemented, traffic rates on roadways would depend on the number of residences built on the private lands if the properties are subdivided. Traffic counts would not change by alternative. The counts are listed below under Impacts Common to Horcado Ranch Road Access Alternatives, Section 3.2.7.10.

3.2.7.5 Direct Impacts Associated with Alternative D (Road Segments 2, 3, 4, 5, 8, 9)

Construction Term and Roadway Margin Impacts

If Alternative D is implemented, construction vehicles would be traveling to and from the construction area. These vehicles will include a bulldozer, scraper, motor grader, compactor, and water truck. A backhoe may also be needed for trenching. Trucks will deliver CMP culverts and other building materials. About 12,034 tons of gravel will be delivered to the site to surface 4.04 miles of road. If semi-sized dump trucks carry 25 tons of gravel per load, then over the life of the project about 481 dump-truck loads of gravel would be transported on area roads. The work force would vary, averaging four workmen and one foreman per day. Vehicles would be parked within the right-of-way on the road sections previously built or in a Temporary Use Area. The road construction term would be approximately 180 working days. In all, the workers' commute and gravel trucks would add up to 16 trips/day (Walbridge, 2001).

Long-Term Roadway Impacts

If Alternative D is implemented, traffic rates on roadways would depend on the number of residences built on the private lands if the properties are subdivided. Traffic counts would not change by alternative. The counts are listed below under Impacts Common to Horcado Ranch Road Access Alternatives, Section 3.2.7.10.

3.2.7.6 Direct Impacts Associated with Alternative E (Road Segments 3, 4, 5, 6, 7, 10, 11)

Construction Term and Roadway Margin Impacts

If Alternative E is implemented, construction vehicles would be traveling to and from the construction area. These vehicles will include a bulldozer, scraper, motor grader, compactor, and water truck. A backhoe may also be needed for trenching. Trucks will deliver CMP culverts and other building materials. In addition, trucks would be delivering items such as pilings, caps, and concrete to build the bridge across Calabasa Arroyo. About 20,970 tons of gravel will be delivered to the site to surface 7.04 miles of road. If semi-sized dump trucks carry 25 tons of gravel per load, then over the life of the project about 839 dump-truck loads of gravel would be transported on area roads. The work force would vary, averaging four workmen and one foreman per day. Vehicles would be parked within the right-of-way on the road sections previously built or in a Temporary Use Area. The road construction term would be approximately 496 working days. In all, the workers' commute and gravel trucks would add up to 16 trips/day (Walbridge, 2001).

Long-Term Roadway Impacts

If Alternative E is implemented, traffic rates on roadways would depend on the number of residences built on the private lands if the properties are subdivided. Traffic counts would not change by alternative. The counts are listed below under Impacts Common to Buckman Road Access Alternatives, Section 3.2.7.11.

3.2.7.7 Direct Impacts Associated with Alternative F (Road Segments 4, 5, 9, 10, 11, 12)

Construction Term and Roadway Margin Impacts

If Alternative F is implemented, construction vehicles would be traveling to and from the construction area. These vehicles will include a bulldozer, scraper, motor grader, compactor, and water truck. A backhoe may also be needed for trenching. Trucks will deliver CMP culverts and other building materials. In addition, trucks would be delivering items such as pilings, caps, and concrete to build the bridge across Calabasa Arroyo. About 16,860 tons of gravel will be delivered to the site to surface 5.66 miles of road. If dump trucks carry 25 tons of gravel per load, then over the life of the project about 674 dump-truck loads of gravel would be transported on area roads. The work force would vary, averaging four workmen and one foreman per day. Vehicles would be parked within the right-of-way on the road sections previously built or in a Temporary Use Area. The road construction term would be approximately 261 working days. In all, the workers' commute and gravel trucks would add up to 16 trips/day (Walbridge, 2001).

Long-Term Roadway Impacts

If Alternative F is implemented, traffic rates on roadways would depend on the number of residences built on the private lands if the properties are subdivided. Traffic counts would not change by alternative. The counts are listed below under Impacts Common to Buckman Road Access Alternatives, Section 3.2.7.11.

3.2.7.8 Direct Impacts Associated with Alternative G (Road Segments 1, 2, 3, 4, 5, east half of 7, 13)

Construction Term and Roadway Margin Impacts

If Alternative G is implemented, construction vehicles would be traveling to and from the construction area. These vehicles will include a bulldozer, scraper, motor grader, compactor, and water truck. A backhoe may also be needed for trenching. Trucks will deliver CMP culverts and other building materials. About 10,157 tons of gravel will be delivered to the site to surface 3.51 miles of road. If semi-sized dump trucks carry 25 tons of gravel per load, then over the life of the project about 406 dump-truck loads of gravel would be transported on area roads. The work force would vary, averaging four workmen and one foreman per day. Vehicles would be parked within the right-of-way on the road sections previously built or in a Temporary Use Area. The road construction term would be approximately 152 working days. In all, the workers' commute and gravel trucks would add up to approximately 16 trips/day (Walbridge, 2001).

Long-Term Roadway Impacts

If Alternative G is implemented, traffic rates on roadways would depend on the number of residences built on the private lands if the properties are subdivided. Traffic counts would not change by alternative. The counts are listed below under Impacts Common to Horcado Ranch Road Access Alternatives, Section 3.2.7.11.

3.2.7.9 Direct Impacts Associated with Alternative H (Road Segments 2, 3, 4, 5, east half of 7, 8, 13)

Construction Term and Roadway Margin Impacts

If Alternative H is implemented, construction vehicles would be traveling to and from the construction area. These vehicles will include a bulldozer, scraper, motor grader, compactor, and water truck. A backhoe may also be needed for trenching. Trucks will deliver CMP culverts and other building materials. About 10,336 tons of gravel will be delivered to the site to surface 4.04 miles of road. If semi-sized dump trucks carry 25 tons of gravel per load, then over the life of the project about 414 dump-truck loads of gravel would be transported on area roads. The work force would vary, averaging four workmen and one foreman per day. Vehicles would be parked within the right-of-way on the road sections previously built or in a Temporary Use Area. The road construction term would be approximately 154 working days. In all, the workers' commute and gravel trucks would add up to 16 trips/day (Walbridge, 2001).

Long-Term Roadway Impacts

If Alternative H is implemented, traffic rates on roadways would depend on the number of residences built on the private lands if the properties are subdivided. Traffic counts would not change by alternative. The counts are listed below under Impacts Common to Horcado Ranch Road Access Alternatives, Section 3.2.7.10.

3.2.7.10 Secondary Impacts Common to Horcado Ranch Road Access Alternatives (Alternatives A, B, C, D, G, H)

Construction term impacts for Alternatives A–D, G, and H, using Horcado Ranch Road as the connecting road, would include the travel of heavy equipment along arterial roads that are used by residents of scattered rural properties and the subdivisions of La Tierra and Las Dos. The roads involved include Camino la Tierra to its intersection with Paseo de la Tierra, Paseo de la Tierra, Estrada Calabasa, and Horcado Ranch Road. These additional vehicles would increase traffic on Horcado Ranch Road by 0.3% over current weekday levels. There would be no change in traffic on weekends. This additional traffic would increase the sights and sounds of human activity on Horcado Ranch Road as well as in the project area. Recreational traffic may increase in the project area as a result of road development.

Anticipating that a minimum of 11 lots (La Luz Group, L. Walker, P. Ortiz and eight heirs of S. "Zannie" Hoyt) would be improved on the private lands once access is acquired, the design parameters would be for a two-way 24-hour average daily traffic (ADT) of 55 vehicles per day at Horcado Ranch Road. This would increase traffic 1.7 times on weekdays and 2.4 times on weekends. The traffic volume, based on 80 lots of 20 acres each, the level of subdivision projected by the project engineer given the rough terrain, would be 440 vehicles per day. This would be 6.5 times the current weekday traffic levels and 12.6 times the current traffic level on weekends. The maximum traffic volume based on 128 lots of 12.5 acres each would be 704 trips per day. This would be 9.8 times the current weekday traffic levels and 19.5 times the current traffic level on weekends. These figures are based on statements in the POD (Walbridge, 2001) and Santa Fe Model Trip Generation Standards (Pitts, 2002). Additional traffic would potentially

cause further erosion and washboarding on Horcado Ranch Road. Horcado Ranch Road is classed as a sub-collector road based on the existing and potential houses that could be served by this route (Santa Fe County, 1986).

3.2.7.11 Secondary Impacts Common to Buckman Road Access Alternatives (Alternatives E and F)

Construction term impacts for Alternatives E and F that would use Buckman Road as the connecting road would include the travel of heavy equipment along arterial roads that are used by residents of scattered rural properties and the subdivisions of La Tierra Nueva and Las Campañas. The roads involved include Camino la Tierra up to and past Paseo de la Tierra and Buckman Road. Assuming the same rate of construction work on Alternatives E and F, this additional traffic would increase traffic on Buckman Road by three times the counter recorded average on the weekdays and would increase the sights and sounds of human activity on Buckman Road as well as in the project area. There would be no change in traffic on weekends. Recreational traffic may increase in the project area as a result of road development.

Anticipating that a minimum of 11 lots (La Luz Group, L. Walker, P. Ortiz and eight heirs of S. Zannie Hoyt) would be improved on the private lands once access is acquired, the design parameters would be for a two-way 24-hour average daily traffic (ADT) of 55 vehicles per day at Buckman Road. This would increase traffic 5.6 times over the traffic counter average on weekdays and by 2 times on the weekends. The traffic volume, based on 80 lots of 20 acres each, the level of subdivision projected by the project engineer given the rough terrain, would be 440 vehicles per day. This would increase the traffic volume 37.8 times the traffic counter average on weekdays and by 9 times on weekends. The maximum traffic volume based on 128 lots of 12.5 acres each would be 704 trips/day. This would increase traffic by 59.6 times on weekdays and 14 times on weekends. These figures are based on statements in the POD (Walbridge, 2001) and Santa Fe Model Trip Generation Standards (Pitts, 2002). Additional traffic would potentially cause further erosion and washboarding on Buckman Road. Buckman Road is classed as a sub-collector road based on the existing and potential houses that could be served by this road (Santa Fe County, 1986).

3.2.7.12 Direct Impacts Associated with Alternative I (the No Action Alternative)

If Alternative I is implemented, there would be no gravel truck or construction worker trips across Horcado Ranch Road or Buckman Road. There would be no additional long-term traffic from potential subdivision of the private properties, and there would be no impact to communities as a result.

3.2.7.13 Comparison of Action Alternatives

As shown in Table 3.6, Alternatives G and H would require the fewest days (152 and 154, respectively) to complete construction, not including the 1/2 mile that would have to be built to access the P. Ortiz property.

Table 3.6. Anticipated Traffic during the Construction Term for Each Alternative

Alternative	Amount of Gravel Needed for Road (tons)	Construction Term (days)	Trips/Day at 20-acre Build-out over Long Term
A (Proposed Action)	14,000	209	440
B	12,153	181	440
C	13,791	206	440
D	12,034	180	440
E	20,970	496	440
F	16,860	261	440
G	10,157	152	440
H	10,336	154	440
I	0	0	0

The bridge across Calabasa Arroyo, to be built if Alternative E or Alternative F is implemented, would add truck traffic to Buckman Road and Camino de la Tierra carrying concrete, bridge pilings, and caps. This impact would not result from the implementation of Alternative A, B, C, D, G, or H. Alternative E would have the longest term of construction, at 496 days.

3.2.7.14 Connected Action

Additional travel on roads within the affected private properties may result from the proposed project, depending on the density of any subdivision of the properties. The density of subdivision will be determined by the owners, the terrain, and State of New Mexico and Santa Fe County laws and ordinances. The likelihood and density of the potential subdivision of the properties is discussed in Section 3.8.1, Secondary and Cumulative Effects. Minimum and maximum traffic projections based on subdivision density are listed in Sections 3.2.7.10 and 3.2.7.11.

3.3 LIVING RESOURCES

3.3.1 Vegetation

3.3.1.1 Existing Conditions

Habitat in the project area is predominantly a mosaic of piñon-juniper woodland and rolling juniper savanna. Some arroyo-riparian vegetation lines arroyos that are crossed by the potential project corridors, this being especially notable at the Calabasa Arroyo crossing at Road Segment 10 of Alternatives E and F and Road Segment 9 of Alternatives B, D, and F (Dick-Peddie, 1993). Flat areas tend more to savanna community, and the hills tend to be in woodland. The dominant species within the woodland is one-seed juniper (*Juniperus monosperma*). A severe die-off of piñon trees (*Pinus edulis*) in the area has occurred as a result of drought and bark beetle infestation. However, many new, young piñons are coming in under the dead trees. The dominant species in the savanna community are blue grama (*Bouteloua gracilis*) and galleta (*Pleuraphis jamesii*). Table 3.7 shows the number of dead and live mature trees that are within the disturbance zone for road construction. Trees were counted on aerial photographs, and the percentage of dead trees was ascertained from 360-degree photo shoots along each of the alternate potential road segments. Table 3.8 shows the acreage of habitat disturbance for each alternative.

Table 3.7. Estimated Tree Counts within 24-foot Roadway Disturbance Area for Each Alternative

Alternative	Tree Count	Percent Dead Piñon	Number Dead Piñon	Number Live Juniper
A (Proposed Action)	1,180	40%	472	708
B	855	43%	368	487
C	1,113	40%	445	668
D	788	43%	339	449
E	1,469	35%	514	955
F	947	25%	237	710
G	830	37%	307	523
H	823	37%	305	518
I	0	N/A	N/A	N/A

Table 3.8. Estimated Acreage of Maximum Habitat Disturbance for Each Alternative

Alternative	Road Margin Impact (acres)	Roadway Impact (acres)	Piñon-Juniper Woodland	Road Margin PJW (acres)	Roadway PJW (acres)	Juniper Savanna	Road Margin JSav (acres)	Roadway JSav (acres)
A	22.4	7.4	90%	20.16	6.66	10%	2.24	0.74
B	19.7	6.6	50%	9.85	3.3	50%	9.85	3.3
C	21.3	6.7	90%	19.17	6.03	10%	2.13	0.67
D	18.6	5.9	50%	9.3	2.95	50%	9.3	2.95
E	37.8	11.3	90%	34.02	10.17	10%	3.78	1.13
F	34.3	9.8	70%	24.01	6.86	30%	10.29	2.94
G	17.7	6.4	75%	13.1	4.8	25%	4.6	1.6
H	16.7	5.7	75%	12.5	4.3	25%	4.2	1.4
I	0.0	0.0	0%	0.0	0.0	0%	0.0	0.0

Note: See Table 2.1 for calculation of impacted area.
 PJW=piñon-juniper woodland; JSav=juniper savannah

3.3.1.2 Direct Impacts Associated with Alternative A (Road Segments 1, 2, 3, 4, 5, 6, 7)

Construction Term and Roadway Margin Impacts

If Alternative A is implemented, up to 22.4 acres of vegetation, including grasses, forbs, shrubs, trees, and cacti, would be removed by clearing and grubbing of the road and road margins during the construction term. Twenty acres of this total would be in piñon-juniper woodland, and 2 acres would be in juniper savanna. About 1,180 trees were counted in the road and road margins. Approximately 40% (472) of the trees were dead; the rest were live junipers. The dead trees would be removed during road construction. Up to 708 live trees would be removed only if necessary and with direction from the BLM.

Long-Term Roadway Impacts

If Alternative A is implemented, up to 7.4 acres of vegetation would be permanently covered by gravel roadway. Of this total, 6.7 acres would be former piñon-juniper woodland habitat and 0.7 acre would be former juniper savanna.

3.3.1.3 Direct Impacts Associated with Alternative B (Road Segments 1, 2, 3, 4, 5, 9)

Construction Term and Roadway Margin Impacts

If Alternative B is implemented, up to 19.7 acres of vegetation, including grasses, forbs, shrubs, trees, and cacti, would be removed by clearing and grubbing of the road and road margins during the construction term. Half of this total would be in piñon-juniper woodland and half in juniper savanna. About 855 trees were counted in the road and road margins. Of these, approximately 43% (368) were dead; the rest were live junipers. The dead trees would be removed during road construction. Up to 487 live trees would be removed only if necessary and with direction from the BLM.

Long-Term Roadway Impacts

If Alternative B is implemented, up to 6.6 acres of vegetation would be permanently covered by gravel roadway. Of this total, half would be former piñon-juniper woodland habitat and half would be former juniper savanna.

3.3.1.4 Direct Impacts Associated with Alternative C (Road Segments 2, 3, 4, 5, 6, 7, 8)

Construction Term and Roadway Margin Impacts

If Alternative C is implemented, up to 21.3 acres of vegetation, including grasses, forbs, shrubs, trees, and cacti, would be removed by clearing and grubbing of the road and road margins during the construction term. Twenty acres would be in piñon-juniper woodland, and 2 acres would be in juniper savanna. About 1,180 trees were counted in the road and road margins. Approximately 40% (472) of the trees were dead; the rest were live junipers. The dead trees would be removed by road construction. Up to 668 live trees would be removed only if necessary and with direction from the BLM.

Long-Term Roadway Impacts

If Alternative C is implemented, up to 6.7 acres of vegetation would be permanently covered by gravel roadway. Six acres would be piñon-juniper woodland habitat, and 0.7 acre would be juniper savanna.

3.3.1.5 Direct Impacts Associated with Alternative D (Road Segments 2, 3, 4, 5, 8, 9)

Construction Term and Roadway Margin Impacts

If Alternative D is implemented, up to 18.6 acres of vegetation, including grasses, forbs, shrubs, trees, and cacti, would be removed by clearing and grubbing of the road and road margins during the construction term. Half would be in piñon-juniper woodland and half would be in juniper savanna. About 788 trees were counted in the road and road margins. Approximately 43% (339) of the trees were dead; the rest were live junipers. The dead trees would be removed by road construction. Up to 449 live trees would be removed only if necessary and with direction from the BLM.

Long-Term Roadway Impacts

If Alternative D is implemented, up to 6 acres of vegetation would be permanently covered by gravel roadway. Half would be former piñon-juniper woodland habitat and half would be former juniper savanna.

3.3.1.6 Direct Impacts Associated with Alternative E (Road Segments 3, 4, 5, 6, 7, 10, 11)

Construction Term and Roadway Margin Impacts

If Alternative E is implemented, up to 37.8 acres of vegetation, including grasses, forbs, shrubs, trees, and cacti, would be removed by clearing and grubbing of the road and road margins during the construction term. Of this total, 34 acres would be in piñon-juniper woodland and 4 acres would be in juniper savanna. About 1,469 trees were counted in the road and road margins. Approximately 35% (514) of the trees were dead; the rest were live junipers. The dead trees would be removed by road construction. Up to 955 live trees would be removed only if necessary and with direction from the BLM.

Long-Term Roadway Impacts

If Alternative E is implemented, up to 11.3 acres of vegetation would be permanently covered by gravel roadway. Of this total, 10.2 acres would be former piñon-juniper woodland habitat and 1.1 acres would be former juniper savanna.

3.3.1.7 Direct Impacts Associated with Alternative F (Road Segments 4, 5, 9, 10, 11, 12)

Construction Term and Roadway Margin Impacts

If Alternative F is implemented, up to 34.3 acres of vegetation, including grasses, forbs, shrubs, trees, and cacti, would be removed by clearing and grubbing of the road and road margins during the construction term. Of this total, 24 acres would be in piñon-juniper woodland and 10.3 acres would be in juniper savanna. About 947 trees were counted in the road and road margins. Approximately 25% (237) of the trees were dead; the rest were live junipers. The dead trees would be removed by road construction. Up to 710 live trees would be removed only if necessary and with direction from the BLM.

Long-Term Roadway Impacts

If Alternative F is implemented, up to 9.8 acres of vegetation would be permanently covered by gravel roadway. Of this total, 6.9 acres would be former piñon-juniper woodland habitat and 2.9 acres would be former juniper savanna.

3.3.1.8 Direct Impacts Associated with Alternative G (Road Segments 1, 2, 3, 4, 5, east half of 7, 13)

Construction Term and Roadway Margin Impacts

If Alternative G is implemented, up to 17.7 acres of vegetation, including grasses, forbs, shrubs, trees, and cacti, would be removed by clearing and grubbing of the road and road margins during the construction term. Half of this total would be in piñon-juniper woodland and half in juniper savanna. About 830 trees were counted in the road and road margins. Of these, approximately 37% (307) were dead; the rest were live junipers. The dead trees would be removed during road construction. Up to 523 live trees would be removed only if necessary and with direction from the BLM.

Long-Term Roadway Impacts

If Alternative G is implemented, up to 6.4 acres of vegetation would be permanently covered by gravel roadway. Of this total, 70% would be former piñon-juniper woodland habitat and 30% would be former juniper savanna.

3.3.1.9 Direct Impacts Associated with Alternative H (Road Segments 2, 3, 4, 5, east half of 7, 8, 13)

Construction Term and Roadway Margin Impacts

If Alternative H is implemented, up to 16.7 acres of vegetation, including grasses, forbs, shrubs, trees, and cacti, would be removed by clearing and grubbing of the road and road margins during the construction term. About 75% would be in piñon-juniper woodland and 25% would be in juniper savanna. About 823 trees were counted in the road and road margins. Approximately 37% (339) of the trees were dead; the rest were live junipers. The dead trees would be removed by road construction. Up to 518 live trees would be removed only if necessary and with direction from the BLM.

Long-Term Roadway Impacts

If Alternative H is implemented, up to six acres of vegetation would be permanently covered by gravel roadway. About 75% would be piñon-juniper woodland habitat and about 25% would be juniper savanna.

3.3.1.10 Secondary Impacts Common to Horcado Ranch Road and Buckman Road Access Alternatives (Alternatives A–H)

No impacts would occur to vegetation along Horcado Ranch Road or Buckman Road as a result of activities in the project area.

3.3.1.11 Direct Impacts Associated with Alternative I (the No Action Alternative)

If Alternative I is implemented, no vegetation would be removed from the project area, hence there would be no impacts to vegetation.

3.3.1.12 Comparison of Action Alternatives

The most construction term and permanent impact among the various alternatives would be along Alternative E. A maximum of 37.8 acres of vegetation would be impacted on the road margins, and 11.3 acres of vegetation would be removed for a graveled road. The next greatest impact would be associated with Alternative F. A maximum of 34.3 acres of vegetation would be impacted along road margins, and 6.7 acres would be removed for a graveled road. Alternative H would cause the least impact. A maximum of 16.7 acres of vegetation would be impacted on road margins, and 5.7 acres would be removed for a graveled road.

The greatest number of live trees (955) could potentially be removed under Alternative E. The next greatest number of live trees (708) could potentially be removed would be under Alternative B, and the smallest number (449) could potentially be removed under Alternative D. Trees would be removed only if necessary, and under the direction of the BLM.

3.3.1.13 Connected Action

Additional disturbance to vegetation may result from construction of house pads and roads on the four parcels to be served by the access roads proposed under Alternatives A–H. The amount of impact to vegetation would depend on the number of parcels created by any subdivision of the properties. The level of subdivision will be determined by the owners, the terrain of the property, and State of New Mexico and Santa Fe County laws and ordinances. Up to 2.6% of vegetation on private lands could be lost under roads and house construction with the maximum level of subdivision possible (3 miles of road and 1/4 acre of vegetation per 12.5-acre lot). The likelihood and density of the potential subdivision of the properties is discussed in Section 3.8.1, Secondary and Cumulative Effects.

3.3.2 Wildlife

3.3.2.1 Existing Conditions

The piñon-juniper and juniper savanna communities offer many habitats that are important sources of food and shelter for wildlife. Though obviously not present within the existing roadways, many burrows and nests were seen in immediately adjacent areas. As might be expected, the less disturbed areas offer potential habitats of proportionally better quality. Populations or types of wildlife do not vary in a notable degree among the various alternative

routes. Piñon-juniper woodland occurs at higher elevations, on ridge tops along Road Segments 6 and 7 of Alternatives A, C, E, G, and H, hilltops along Segment 11 of Alternatives E and F, hilltops along Segment 12 of Alternative F, and hillsides along Segment 13 of Alternatives G and H. Woodland is especially attractive for nesting birds.

Invertebrates. The plant communities found within the proposed project area no doubt support numerous underground, aboveground, tree-dwelling, and flying insects and spiders. Because of the extreme seasonality of their presence, their cryptic morphology, and the scarce information available on the distribution of these species, it is difficult to determine their local status.

Fish. The project area lacks permanent surface water, and there are no nearby sources that could contribute influxes of fish species in connection with seasonal water availability. All arroyos in the project area drain and add sediment loads to the Rio Grande.

Amphibians and Reptiles. The number of amphibian species likely to occur within the area is low owing to the lack of surface water. Only amphibian species that are able to tolerate arid conditions throughout most of the year will utilize this area. The snakes and lizards associated with the project area are common species typically found in similar climatic and elevational conditions.

Birds. The proposed project area contains many existing and potential nest sites within the trees, shrubs, and dense grasses. The vegetation of the area also supplies cover and roosting sites for birds. It is likely that many songbirds forage among the patches of seed- and insect-rich vegetation. Additionally, raptors, owls, and other birds of prey likely utilize the area for hunting.

Mammals. The habitats in and around the proposed project area are suitable for many underground, aboveground, and tree-dwelling mammals. Additionally, larger predators may utilize the rodent-rich prey base for hunting. Some of the trees and shrubs in the area have rodent and rabbit burrows skirting their bases.

General impacts to wildlife for all of the alternatives would be:

- *Invertebrates.* There are likely to be localized disturbances to many insect and spider communities that would result in varying degrees of mortality. This effect would be particularly profound among the belowground- and aboveground-dwelling species. Vegetative losses would decrease food, shelter, and nest sites for many individuals.
- *Fish.* Arroyos in the project area drain to the Rio Grande. Sediment loosened in the arroyos due to project construction could find its way to the Rio Grande and impact fish populations. Best Management Practices such as silt fencing and straw bales would prevent construction-related sediment loads from reaching the Rio Grande. Culverts would be constructed to prevent channel degradation.
- *Amphibians and Reptiles.* It is likely that some amphibian and reptile den sites and burrows, as well as other shelter areas, would be destroyed during construction activities. Displaced individuals would have to compete with neighboring individuals, which might lead to some

additional mortality. This consequence may be minimal if existing populations are currently below the maximum number of individuals that can be supported by the resources in the area.

- *Birds*. The primary concern regarding the integrity of avian communities associated with the proposed project area is the potential for removal or alteration of nesting and roosting sites. The removal or severe alteration of any vegetation within the project areas would result in a loss of current or potential nest and roost sites.
- *Mammals*. Construction activities would destroy some mammal burrows, which would likely result in some mortality, as the majority of burrowing mammals are nocturnal and occupy these burrows during the daytime.

3.3.2.2 Direct Impacts Associated with Alternative A (Road Segments 1, 2, 3, 4, 5, 6, 7)

Construction Term and Roadway Margin Impacts

If Alternative A is implemented, construction term disturbance would occur at up to 20 acres of woodland wildlife habitat and 2 acres of savanna habitat.

Long-Term Roadway Impacts

If Alternative A is implemented, up to 7 acres of woodland habitat and 0.7 acre of savanna habitat will be permanently replaced by gravel roads.

3.3.2.3 Direct Impacts Associated with Alternative B (Road Segments 1, 2, 3, 4, 5, 9)

Construction Term and Roadway Margin Impacts

If Alternative B is implemented, up to 9.8 acres of woodland habitat and 9.8 acres of savanna habitat will be impacted by construction term disturbance.

Long-Term Roadway Impacts

If Alternative B is implemented, up to 3.3 acres of woodland habitat and 3.3 acres of savanna habitat will be permanently replaced by gravel roads.

3.3.2.4 Direct Impacts Associated with Alternative C (Road Segments 2, 3, 4, 5, 6, 7, 8)

Construction Term and Roadway Margin Impacts

If Alternative C is implemented, construction term disturbance would occur at up to 19 acres of woodland wildlife habitat and 2 acres of savanna habitat.

Long-Term Roadway Impacts

If Alternative C is implemented, up to 6 acres of woodland habitat and 0.7 acre of savanna habitat will be permanently replaced by gravel roads.

3.3.2.5 Direct Impacts Associated with Alternative D (Road Segments 2, 3, 4, 5, 8, 9)

Construction Term and Roadway Margin Impacts

If Alternative D is implemented, construction term disturbance would occur at up to 9 acres of woodland wildlife habitat and 9 acres of savanna habitat.

Long-Term Roadway Impacts

If Alternative D is implemented, up to 3 acres of woodland habitat and 3 acres of savanna habitat will be permanently replaced by gravel roads.

3.3.2.6 Direct Impacts Associated with Alternative E (Road Segments 3, 4, 5, 6, 7, 10, 11)

Construction Term and Roadway Margin Impacts

If Alternative E is implemented, construction term disturbance would occur at up to 34 acres of woodland wildlife habitat and 4 acres of savanna habitat.

Long-Term Roadway Impacts

If Alternative E is implemented, up to 10 acres of woodland habitat and 1 acre of savanna habitat will be permanently replaced by gravel roads.

3.3.2.7 Direct Impacts Associated with Alternative F (Road Segments 4, 5, 9, 10, 11, 12)

Construction Term and Roadway Margin Impacts

If Alternative F is implemented, construction term disturbance would occur at up to 24 acres of woodland wildlife habitat and 10 acres of savanna habitat.

Long-Term Roadway Impacts

If Alternative F is implemented, up to 7 acres of woodland habitat and 3 acres of savanna habitat will be permanently buried under gravel roads.

3.3.2.8 Direct Impacts Associated with Alternative G (Road Segments 1, 2, 3, 4, 5, east half of 7, 13)

Construction Term and Roadway Margin Impacts

If Alternative G is implemented, up to 13 acres of woodland habitat and 4.6 acres of savanna habitat will be impacted by construction term disturbance.

Long-Term Roadway Impacts

If Alternative G is implemented, up to 5 acres of woodland habitat and 1.6 acres of savanna habitat will be permanently replaced by gravel roads.

3.3.2.9 Direct Impacts Associated with Alternative H (Road Segments 2, 3, 4, 5, east half of 7, 8, 13)

Construction Term and Roadway Margin Impacts

If Alternative H is implemented, construction term disturbance would occur at up to 12.5 acres of woodland wildlife habitat and 4 acres of savanna habitat.

Long-Term Roadway Impacts

If Alternative H is implemented, up to 4.3 acres of woodland habitat and 1.4 acres of savanna habitat will be permanently replaced by gravel roads.

3.3.2.10 Secondary Impacts Common to Horcado Ranch Road Access Alternatives (Alternatives A, B, C, D, G, H)

No wildlife habitat will be removed at the existing roads entering the project area, including Horcado Ranch Road, Estrada Calabasa, Paseo de la Tierra, and Camino la Tierra.

3.3.2.11 Secondary Impacts Common to Buckman Road Access Alternatives (Alternatives E and F)

No wildlife habitat will be disturbed at the existing roads entering the southwest end of the project area, including Camino la Tierra and Buckman Road.

3.3.2.12 Direct Impacts Associated with Alternative I (the No Action Alternative)

If Alternative I is implemented, there will be no impacts to wildlife habitat.

3.3.2.13 Comparison of Action Alternatives

Impacts to wildlife are summarized in Table 3.9. A construction term impact of up to 34 acres of woodland habitat would occur under Alternative E. A construction term impact to 9 acres of woodland habitat would occur under Alternative D.

Under Alternative F, 10 acres of woodland habitat would be replaced by permanent graveled roadways. Under Alternative B, 3 acres of woodland habitat would be replaced by permanent graveled roadways. Alternative H would have the least impact to wildlife habitats as a whole (up to 16.7 acres of construction disturbance). Under Alternative E, 34 acres of savanna habitat would be impacted. Under Alternative C, up to 2 acres of savanna habitat would be impacted during the construction term. Under Alternative B, up to 3.3 acres of savanna habitat would be

Table 3.9. Wildlife Habitat Impacts under Each Alternative

Alternative	Woodland Habitat Impacts (acres)		Savanna Habitat Impacts (acres)	
	Temporary	Permanent	Temporary	Permanent
A (Proposed Action)	20	7	2	0.7
B	9.8	3.3	9.8	3.3
C	19	6	2	0.7
D	9	3	9	3
E	34	10	4	1
F	24	7	10	3
G	13	5	4.6	1.6
H	12.5	4.3	4	1.4
I	0.0	0	0	0

replaced by permanent graveled roadways. Under Alternatives A and C, up to 0.7 acre of savanna habitat would be replaced by permanent graveled roadways.

3.3.2.14 Connected Action

Additional disturbance to wildlife habitat may result from construction of house pads and roads on the four parcels to be served by the access roads proposed under Alternatives A–H. The amount of wildlife habitat impact would depend on the density of any subdivision of the properties. The level of subdivision will be determined by the owners, the terrain of the property, and State of New Mexico and Santa Fe County laws and ordinances. Under the scenario of the highest maximum density housing development (12.5-acre lots), up to 2.6% of wildlife habitat on the private lands served by the roads could be lost permanently by construction of houses and roads. The likelihood and density of the potential subdivision of the properties is discussed in Section 3.8.1, Secondary and Cumulative Effects.

3.3.3 Special Status Species

3.3.3.1 Existing Conditions

Plants

Table 3.10 lists the six Threatened, Endangered, and Sensitive (TES) plant species known to occur within Santa Fe County. None of these species was encountered during the field surveys, including the Santa Fe cholla (*Opuntia viridiflora*), a species that could potentially occur within the proposed project area. Field surveys were completed on November 2–3, 2000, and July 2, 2003. A general qualification of the area was determined based on vegetation health, composition, and stature and by assessing level of previous disturbances. Unique potential plant habitats were examined (SWCA, 2002). Given the available habitat, the only other TES plant that could potentially occur within the proposed project area is the Santa Fe milkvetch (*Astragalus feensis*).

- *Santa Fe cholla*. A State Endangered, BLM Sensitive, and Federal Species of Concern, the Santa Fe cholla most commonly occurs at elevations between 5,800 and 7,200 feet on gravelly, rolling hills in piñon-juniper woodlands (NMRPTC, 2000). Piñon-juniper wood-

Table 3.10. Special Status Plant Species Known to Occur in Santa Fe County, New Mexico

Common Name (Scientific Name)	Status		General Habitat	Potential Project Impact
	Fed	NM		
Flint Mountains milkvetch (<i>Astragalus siliceous</i>)	–	SC	Calcareous knolls and rocky areas in rolling shortgrass prairie	None – Project area does not contain suitable habitat
Tufted sand verbena (<i>Abronia bigelovii</i>)	–	SC	Hills and ridges with gypseous soils	None – Project area does not contain suitable habitat
Santa Fe milkvetch (<i>Astragalus feensis</i>)	–	SC	Gravelly hillsides in piñon-juniper; grasslands	Possible – Project area may contain suitable habitat
Sapello Canyon larkspur (<i>Delphinium sapellonis</i>)	–	SC	Montane canyon bottoms and aspen groves	None – Project area does not contain suitable habitat
Springer's blazing star (<i>Mentzelia springeri</i>)	–	SC	Pyroclastic soils in piñon-juniper woodlands	None – Project area does not contain suitable habitat
Santa Fe cholla (<i>Opuntia viridiflora</i>)	SC BLM	E	Gravelly rolling hills in piñon-juniper woodlands	Possible – Not found during field survey but habitat may be suitable

Designations: E=Endangered, BLM=BLM Sensitive, SC=Species of Concern
From NMDGF, 2002; NMRPTC, 2002; Sivinski and Lightfoot, 1995; USFWS, 2002

land occurs at higher elevations on ridge tops at Road Segments 6 and 7 of Alternatives A, C, E, G, and H, the hill at Road Segment 1 of Alternatives A, B, and G, hilltops at Road Segment 11 of Alternatives E and F, hilltops at Segment 12 of Alternative E, and hills at Segment 13 of Alternatives G and H.

Currently, Santa Fe cholla is known only from Fort Marcy Park in Santa Fe and in the Pojoaque area. There appears to be suitable habitat for this cactus in the proposed project area, though no specimens were found during the field surveys. It is not likely that this species occurs within or near the proposed project routes.

- *Santa Fe milkvetch.* The Santa Fe milkvetch is a State Species of Concern. This species occurs at elevations between 5,100 and 6,000 feet on sandy benches and gravelly hillsides in piñon-juniper woodlands or plains-mesa grasslands (NMRPTC, 2000). This species is relatively common in suitable habitat within its range. The Santa Fe milkvetch may occur within the proposed project area.

Animals

Table 3.11 lists all TES wildlife known to occur in Santa Fe County. Although none of these 31 species was observed during the field surveys, it is possible that some of them may seasonally utilize the proposed project area or be affected by construction activities. Field surveys were completed on November 2–3, 2000, and July 2, 2003. A general qualification of the area was determined based on vegetation health, composition, and stature and by assessing level of pre-

Table 3.11. Special Status Wildlife Species Known to Occur in Santa Fe County, New Mexico

Common Name (Scientific Name)	Status		General Habitat	Potential Project Impact
	Fed	NM		
Reptiles				
Texas horned lizard (<i>Phrynosoma cornutum</i>)	SC BLM	–	Open deserts and grasslands	Possible – Project area may contain marginal habitat
Birds				
American peregrine falcon (<i>Falco peregrinus</i>)	SC	T	Open country with steep canyons	None – Project area does not contain suitable habitat
Arctic peregrine falcon (<i>Falco peregrinus tundrius</i>)	SC	–	Open country with steep canyons	None – Project area does not contain suitable habitat
Baird's sparrow (<i>Ammodramus bairdii</i>)	SC BLM	T	Winters in prairie areas	None – Project area does not contain suitable habitat
Bald eagle (<i>Haliaeetus leucocephalus</i>)	T	T	Winters along shores of rivers, lakes, reservoirs	None – Project area does not contain suitable habitat
Boreal owl (<i>Aegolius funereus</i>)	–	T	Mature montane coniferous forests	None – Project area does not contain suitable habitat
Ferruginous hawk (<i>Buteo regalis</i>)	BLM	–	Arid plains and open rangelands	None – Project area does not contain suitable habitat
Gray vireo (<i>Vireo vicinior</i>)	–	T	Open woodlands with well-developed grasses	Possible – Project area may contain suitable habitat
Loggerhead shrike (<i>Lanius ludovicianus</i>)	BLM	–	Open country and desert scrub	Possible – Project area may contain suitable habitat
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	T	S	Mature mixed-conifer and pine-oak forests	None – Project area does not contain suitable habitat
Mountain plover (<i>Charadrius montanus</i>)	PT	S	Sparse, semiarid grasslands and plains	None – Project area does not contain suitable habitat
Northern goshawk (<i>Accipiter gentilis</i>)	SC BLM	S	High elevation mature coniferous forests	None – Project area does not contain suitable habitat
Southwestern willow flycatcher (<i>Empidonax traillii</i>)	E	E	Dense riparian groves and thickets	None – Project area does not contain suitable habitat
Western burrowing owl (<i>Athene cunicularia hypugaea</i>)	BLM	–	Open grasslands, prairies, desert scrub	None – Project area does not contain suitable habitat

Table 3.11. Special Status Wildlife Species Known to Occur in Santa Fe County, New Mexico, continued

Common Name (<i>Scientific Name</i>)	Status		General Habitat	Potential Project Impact
	Fed	NM		
Birds, continued				
White-faced ibis (<i>Plagadis chihi</i>)	BLM	–	Freshwater marshes and backwaters	None – Project area does not contain suitable habitat
White-tailed ptarmigan (<i>Lagopus leucurus altipetens</i>)	–	E	Alpine tundra and timberline openings	None – Project area does not contain suitable habitat
Whooping crane (<i>Grus americana</i>)	E	E	Marshes, prairie potholes, backwaters	None – Project area does not contain suitable habitat
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	C	–	Dense riparian shrubs and woodlands	None – Project area does not contain suitable habitat
Mammals				
American marten (<i>Martes americana</i>)	–	T	High-elevation coniferous forests	None – Project area does not contain suitable habitat
Fringed myotis (<i>Myotis thysandodes</i>)	BLM	S	Varied – associated with caves and mines	None – Project area does not contain suitable habitat
Long-legged myotis (<i>Myotis volans</i>)	BLM	S	Varied – associated with caves and mines	None – Project area does not contain suitable habitat
New Mexican jumping mouse (<i>Zapus hudsonius</i>)	SC BLM	T	Dense riparian forb-grass communities	None – Project area does not contain suitable habitat
Occult little brown bat (<i>Myotis lucifugus occultus</i>)	BLM	S	Varied – associated with caves and mines	None – Project area does not contain suitable habitat
Small-footed myotis (<i>Myotis ciliolabrum</i>)	BLM	S	Varied – associated with caves and mines	None – Project area does not contain suitable habitat
Spotted bat (<i>Euderma maculatum</i>)	BLM	T	Rocky outcroppings, mature forests, caves	None – Project area does not contain suitable habitat
Townsend’s big-eared bat (<i>Plecotus townsendii</i>)	SC BLM	S	Varied – associated with caves and mines	None – Project area does not contain suitable habitat
Yuma myotis (<i>Myotis yumanensis</i>)	BLM	S	Varied – associated with caves and mines	None – Project area does not contain suitable habitat

Table 3.11. Special Status Wildlife Species Known to Occur in Santa Fe County, New Mexico, continued

Common Name (Scientific Name)	Status		General Habitat	Potential Project Impact
	Fed	NM		
Fish				
Flathead chub (<i>Platygobio gracilis</i>)	BLM	–	Rivers and larger streams	None – Project area does not contain suitable habitat
Rio Grande sucker (<i>Catostomus plebeius</i>)	SC	–	Small to large mid-elevation streams	None – Project area does not contain suitable habitat
Mollusks				
Cockerell's striate disc snail (<i>Discus shimeki</i>)	BLM	–	Associated with woody debris of spruce, fir or aspen	None – Project area does not contain suitable habitat
Lilljeborg's peaclam (<i>Pisidium lilljeborgi</i>)	–	T	Cold water lakes	None – Project area does not contain suitable habitat

Designations: E=Endangered, T=Threatened, PT=Proposed Threatened, C=Candidate, BLM=BLM Sensitive, SC=Species Of Concern, S=Sensitive
 From NMDGF, 2002; Sublette, 1990; USFWS, 2002

vious disturbances. Potential nesting and burrowing sites were examined for the presence of wildlife (SWCA, 2002). The proposed project area may contain suitable habitat for three: the Texas horned lizard (*Phrynosoma cornutum*), the gray vireo (*Vireo vicinior*), and the loggerhead shrike (*Lanius ludovicianus*).

- *Texas horned lizard.* The Texas horned lizard is listed as a Federal and BLM Species of Concern. This species is most commonly found on sandy to gravelly soils in grasslands and open deserts (Degenhardt et al., 1996). Although there are no records of occurrence for this species in Santa Fe County, two other species of horned lizard are relatively common throughout the county. It is conceivable that Texas horned lizard could occur in the county, and the proposed project area appears to contain suitable habitat, though it is colder and higher than known locations for this lizard. The Texas horned lizard may be difficult to detect because of its cryptic morphology and burrowing behavior. The grasslands of juniper savanna are most common along Road Segment 3, which would be used under all alternatives except Alternative F.
- *Gray vireo.* The gray vireo is a State of New Mexico listed threatened species. These birds occur and breed in open piñon-juniper woodlands with a well-developed grass component. They are insectivorous and are found in New Mexico only during the summer (NMDGF, 2002). This species could occur in the project area during the breeding season. Piñon-juniper woodland occurs at higher elevations on ridge tops at Road Segments 6 and 7 of Alternatives A, C, E, G, and H, the hill at Road Segment 1 of Alternatives A, B, and G, hilltops at Road

Segment 11 of Alternatives E and F, hilltops at Road Segment 12 of Alternative E, and hills at Road Segment 13 of Alternatives G and H.

- *Loggerhead shrike*. The loggerhead shrike is listed as a BLM Species of Concern. This bird utilizes a variety of habitats, including desert scrub and open grasslands, but prefers to nest in trees of medium to tall height. Loggerhead shrikes are fairly common year-round residents throughout Santa Fe County (NMDGF, 2002), though no individuals of this species were seen during the field survey. Additionally, no prey items were found skewered on the thorny vegetation or barbed wire fences of the proposed project area. This species may nest within the area.

Potential Impacts to Listed Species in the Project Area

Plants

The Federal Endangered Species Act of 1973 and the New Mexico Endangered Plant Species Act of 1978 grant Threatened or Endangered plant species legal protection. Species listed as Sensitive or as Species of Concern are not granted specific legal protection. However, management agencies often track the health and distribution of and impacts to such species. This information is used in reviewing the status or updating the distribution records of these species.

- *Santa Fe cholla*. The Santa Fe cholla, which may occur in the vicinity of the proposed project, is legally protected by the State of New Mexico. This cactus is also a Federal Species of Concern and a BLM Sensitive species. This plant was not found during the field surveys of any of the project alignments, it is unlikely that it occurs within the proposed project route, and it would therefore not be impacted.
- *Santa Fe milkvetch*. If this species is present in the immediate area of the proposed project, there may be impacts to local populations. However, the Santa Fe milkvetch is typically abundant where it occurs, and long-term negative impacts to the species would not result from the proposed alternatives.

Wildlife

Threatened or Endangered wildlife species are protected under the Federal Endangered Species Act of 1973 and the New Mexico Wildlife Conservation Act of 1978. The potential for any of these species to occur within the proposed project area is quite low, and none were identified during the field survey. However, because of their mobile nature and seasonal behavior, it is possible that some of these species could be present in the proposed project area just prior to or during construction. Table 3.7 lists approximate numbers of trees that would be removed during project construction under each alternative. Perching and nesting birds commonly use trees. The smallest number of trees would be removed under Alternative D, at 788. Alternative E would remove the most trees, 1,469. Approximately 35% of the trees were dead at the time of biological surveys on the Alternative E alignment, leaving 955 live trees that would have to be removed during project construction. On the Alternative D alignment, 43% of the trees were dead due to drought and bark beetle infestation, leaving 449 live trees that would be removed

during project construction. These numbers are worst-case scenarios, based on total removal of trees in the project rights-of-way. Some trees may be left as habitat trees or transplanted.

- *Texas horned lizard*. The likelihood that this Species of Concern occurs within the proposed project area is very small, and no impacts are anticipated along any of the proposed alternatives.
- *Gray vireo*. Gray vireo may use the piñon-juniper woodland in the project area for nesting. It is recommended that tree removal be done outside of the nesting season for gray vireo, April 15 to August 15.
- *Loggerhead shrike*. Though fairly common throughout Santa Fe County, this Species of Concern was not seen during the field survey. Loggerhead shrikes may nest in trees or bushes in the project area. It is recommended that tree removal be done outside of the nesting season for loggerhead shrike, April 15 to August 15.

3.3.3.2 Direct Impacts Associated with Alternative A (Road Segments 1, 2, 3, 4, 5, 6, 7)

Construction Term and Roadway Margin Impacts

If Alternative A is implemented, up to 20 acres of piñon-juniper woodland could be removed along the roadway. Species such as gray vireo and loggerhead shrike that nest in piñon trees could be impacted if they are nesting during the tree removal phase of construction. A maximum of 1,180 live and dead standing trees could be removed during project construction. Habitat is also available for Santa Fe cholla and Santa Fe milkvetch in these woodlands. Up to 2 acres of juniper savanna could be removed by the construction of proposed Alternative A road segments. Species that would be inclined to use juniper savanna, such as Texas horned lizard, could be impacted by construction along the roadways. Suitable habitat for Santa Fe milkvetch is also present in the juniper savanna.

Long-Term Roadway Impacts

If Alternative A is implemented, 7 acres of piñon-juniper woodland habitat for gray vireo, loggerhead shrike, Santa Fe cholla, and Santa Fe milkvetch would be replaced by graveled roadways. Up to 0.7 acre of juniper savanna habitat for Texas horned lizard and Santa Fe milkvetch would be permanently replaced by graveled roadway.

3.3.3.3 Direct Impacts Associated with Alternative B (Road Segments 1, 2, 3, 4, 5, 9)

Construction Term and Roadway Margin Impacts

If Alternative B is implemented, up to 9.8 acres of piñon-juniper woodland could be removed along the roadway. Species such as gray vireo and loggerhead shrike that nest in piñon trees could be impacted if they are nesting during the tree removal period of construction. A maximum of 855 live and dead standing trees could be removed during project construction. Habitat is also available for Santa Fe cholla and Santa Fe milkvetch in these woodlands. Up to 9.8 acres of juniper savanna could be removed by construction of the proposed Alternative B roads. Species that would be inclined to use juniper savanna, such as Texas horned lizard, could

be impacted by construction along the roadways. Suitable habitat for Santa Fe milkvetch is also present in the juniper savanna.

Long-Term Roadway Impacts

If Alternative B is implemented, up to 3.3 acres of piñon-juniper woodland habitat for gray vireo, loggerhead shrike, Santa Fe cholla, and Santa Fe milkvetch would be replaced by graveled roadways. Up to 3.3 acres of juniper savanna habitat for Texas horned lizard and Santa Fe milkvetch would be replaced by graveled roadway.

3.3.3.4 Direct Impacts Associated with Alternative C (Road Segments 2, 3, 4, 5, 6, 7, 8)

Construction Term and Roadway Margin Impacts

If Alternative C is implemented, up to 19 acres of piñon-juniper woodland could be removed along the roadway. Species that nest in piñon trees, such as gray vireo and loggerhead shrike, could be impacted if they are nesting during the tree removal phase of construction. A maximum of 1,113 live and dead standing trees could be removed during project construction. Habitat is also available for Santa Fe cholla and Santa Fe milkvetch in these woodlands. Up to two acres of juniper savanna could be removed by construction of the proposed Alternative C roads. Species that would be inclined to use juniper savanna, such as Texas horned lizard, could be impacted by construction along the roadways. Suitable habitat for Santa Fe milkvetch is also present in the juniper savanna.

Long-Term Roadway Impacts

If Alternative C is implemented, 6 acres of piñon-juniper woodland habitat for gray vireo, loggerhead shrike, Santa Fe cholla, and Santa Fe milkvetch would be replaced by graveled roadways. Up to 0.7 acre of juniper savanna habitat for Texas horned lizard and Santa Fe milkvetch would be replaced by graveled roadway.

3.3.3.5 Direct Impacts Associated with Alternative D (Road Segments 2, 3, 4, 5, 8, 9)

Construction Term and Roadway Margin Impacts

If Alternative D is implemented, up to 9 acres of piñon-juniper woodland could be removed along the roadway. Species that nest in piñon trees, such as gray vireo and loggerhead shrike, could be impacted if they are nesting during the tree removal period of construction. A maximum of 788 live and dead standing trees could be removed during project construction. Habitat is also available for Santa Fe cholla and Santa Fe milkvetch in these woodlands. Up to nine acres of juniper savanna could be removed by construction of the proposed Alternative D roads. Species that would be inclined to use juniper savanna, such as Texas horned lizard, could be impacted by construction along the roadways. Suitable habitat for Santa Fe milkvetch is also present in the juniper savanna.

Long-Term Roadway Impacts

If Alternative D is implemented, 3 acres of piñon-juniper woodland habitat for gray vireo, loggerhead shrike, Santa Fe cholla, and Santa Fe milkvetch would be replaced by graveled roadways. Three acres of juniper savanna habitat for Texas horned lizard and Santa Fe milkvetch would be replaced by graveled roadway.

3.3.3.6 Direct Impacts Associated with Alternative E (Road Segments 3, 4, 5, 6, 7, 10, 11)

Construction Term and Roadway Margin Impacts

If Alternative E is implemented, up to 34 acres of piñon-juniper woodland could be removed along the roadway. Species that nest in piñon trees, such as gray vireo and loggerhead shrike, could be impacted if they are nesting during the tree removal phase of construction. A maximum of 1,469 live and dead standing trees could be removed during project construction. Habitat is also available for Santa Fe cholla and Santa Fe milkvetch in these woodlands. Up to four acres of juniper savanna could be removed by construction of the proposed Alternative E roads. Species that would be inclined to use juniper savanna, such as Texas horned lizard, could be impacted by construction along the roadways. Suitable habitat for Santa Fe milkvetch is also present in the juniper savanna.

Long-Term Roadway Impacts

If Alternative E is implemented, 10 acres of piñon-juniper woodland habitat for gray vireo, loggerhead shrike, Santa Fe cholla, and Santa Fe milkvetch would be replaced by graveled roadways. Up to 1 acre of juniper savanna habitat for Texas horned lizard and Santa Fe milkvetch would be replaced by graveled roadway.

3.3.3.7 Direct Impacts Associated with Alternative F (Road Segments 4, 5, 9, 10, 11, 12)

Construction Term and Roadway Margin Impacts

If Alternative F is implemented, 24 acres of piñon-juniper woodland could be removed along the roadway. Species that nest in piñon trees, such as gray vireo and loggerhead shrike, could be impacted if they are nesting during the tree removal phase of construction. A maximum of 947 live and dead standing trees could be removed during project construction. Habitat is also available for Santa Fe cholla and Santa Fe milkvetch in these woodlands. Up to 10 acres of juniper savanna could be removed by construction of the proposed Alternative F roads. Species that would be inclined to use juniper savanna, such as Texas horned lizard, could be impacted by construction along the roadways. Suitable habitat for Santa Fe milkvetch is also present in the juniper savanna.

Long-Term Roadway Impacts

If Alternative F is implemented, 7 acres of piñon-juniper woodland habitat for gray vireo, loggerhead shrike, Santa Fe cholla, and Santa Fe milkvetch would be replaced by graveled roadways as a result of Alternative F. Up to 3 acres of juniper savanna habitat for Texas horned lizard and Santa Fe milkvetch would be replaced by graveled roadway.

3.3.3.8 Direct Impacts Associated with Alternative G (Road Segments 1, 2, 3, 4, 5, east half of 7, 13)

Construction Term and Roadway Margin Impacts

If Alternative G is implemented, up to 13 acres of piñon-juniper woodland could be removed along the roadway. Species that nest in piñon trees, such as gray vireo and loggerhead shrike, could be impacted if they are nesting during the tree removal period of construction. A maximum of 830 live and dead standing trees could be removed during project construction. Habitat is also available for Santa Fe cholla and Santa Fe milkvetch in these woodlands. Up to 4.6 acres of juniper savanna could be removed by construction of the proposed Alternative G roads. Species that would be inclined to use juniper savanna, such as Texas horned lizard, could be impacted by construction along the roadways. Suitable habitat for Santa Fe milkvetch is also present in the juniper savanna.

Long-Term Roadway Impacts

If Alternative G is implemented, up to 5 acres of piñon-juniper woodland habitat for gray vireo, loggerhead shrike, Santa Fe cholla, and Santa Fe milkvetch would be replaced by graveled roadways. Up to 1.6 acres of juniper savanna habitat for Texas horned lizard and Santa Fe milkvetch would be replaced by graveled roadway.

3.3.3.9 Direct Impacts Associated with Alternative H (Road Segments 2, 3, 4, 5, east half of 7, 8, 13)

Construction Term and Roadway Margin Impacts

If Alternative H is implemented, up to 12.5 acres of piñon-juniper woodland could be removed along the roadway. Species that nest in piñon trees, such as gray vireo and loggerhead shrike, could be impacted if they are nesting during the tree removal period of construction. A maximum of 823 live and dead standing trees could be removed during project construction. Habitat is also available for Santa Fe cholla and Santa Fe milkvetch in these woodlands. Up to 4 acres of juniper savanna could be removed by construction of the proposed Alternative H roads. Species that would be inclined to use juniper savanna, such as Texas horned lizard, could be impacted by construction along the roadways. Suitable habitat for Santa Fe milkvetch is also present in the juniper savanna.

Long-Term Roadway Impacts

If Alternative H is implemented, 4.3 acres of piñon-juniper woodland habitat for gray vireo, loggerhead shrike, Santa Fe cholla, and Santa Fe milkvetch would be replaced by graveled roadways. Up to 1.4 acres of juniper savanna habitat for Texas horned lizard and Santa Fe milkvetch would be replaced by graveled roadway.

3.3.3.10 Secondary Impacts Common to Horcado Ranch Road Access Alternatives (Alternatives A, B, C, D, G, H)

There would be no construction or long-term impacts to threatened and endangered species along Horcado Ranch Road, Estrada Calabasa, Paseo de la Tierra, or Camino la Tierra as a result of construction of roadways within the project area.

3.3.3.11 Secondary Impacts Common to Buckman Road Access Alternatives (Alternatives E and F)

There would be no impact to threatened and endangered species along Camino la Tierra or Buckman Road as a result of construction of Alternative E or F in the project area.

3.3.3.12 Direct Impacts Associated with Alternative I (the No Action Alternative)

If Alternative I is implemented, there would be no impact to threatened or endangered species.

3.3.3.13 Comparison of Action Alternatives

As shown in Table 3.12, up to 34 acres of construction term impact to gray vireo, loggerhead shrike, Santa Fe cholla, and Santa Fe milkvetch habitat would occur under Alternative E. Up to 9 acres of construction term impact to gray vireo, loggerhead shrike, Santa Fe cholla, and Santa Fe milkvetch habitat would occur under Alternative D.

Table 3.12. Threatened and Endangered Species Habitat Impacts for Each Alternative

Alternative	Gray Vireo, Loggerhead Shrike, Santa Fe Cholla, and Santa Fe Milkvetch Habitat Impacts (acres)		Texas Horned Lizard and Santa Fe Milkvetch Habitat Impacts (acres)	
	Temporary	Permanent	Temporary	Permanent
A	20	7	2	0.7
B	9.8	3.3	9.8	3.3
C	19	6	2	0.7
D	9	3	9	3
E	34	10	4	1
F	24	7	10	3
G	13	5	4.6	1.6
H	12.5	4.3	4	1.4
I	0	0	0	0

Ten acres of gray vireo, loggerhead shrike, Santa Fe cholla, and Santa Fe milkvetch habitat would be replaced by permanent graveled roadways under Alternative F. Three acres of gray vireo, loggerhead shrike, Santa Fe cholla, and Santa Fe milkvetch habitat would be replaced by permanent graveled roadways under Alternatives A and C. Alternative C would have the least impact on the project area as a whole.

Up to 10 acres of construction term impact to Texas horned lizard and Santa Fe milkvetch habitat would occur under Alternative E. Up to 3 acres of construction term impact to Texas horned lizard and Santa Fe milkvetch habitat would occur under Alternative D.

Up to 2 acres of Texas horned lizard and Santa Fe milkvetch habitat would be replaced by permanent graveled roadways with Alternatives A and C. Up to 0.7 acre of Texas horned lizard and Santa Fe milkvetch habitat would be replaced by permanent graveled roadways with either Alternative A or Alternative C. Alternative H would cause the least total impacts to special status species.

3.3.3.14 Connected Action

Additional disturbance to threatened and endangered species habitats may result from construction of house pads and roads on the four parcels to be served by the access roads proposed under Alternatives A–H. The amount of threatened and endangered species habitat impact would depend on the density of any subdivision of the properties. The level of subdivision will be determined by the owners, the terrain of the property, and State of New Mexico and Santa Fe County laws and ordinances. Up to 2.6% of sensitive species habitat on the private lands served by the roads could be lost permanently by construction of houses and roads. The likelihood and density of the potential subdivision of the properties is discussed in section 3.8.1 Secondary and Cumulative Effects.

3.4 TRADITIONAL CULTURAL PROPERTIES; HISTORIC, CULTURAL, AND ARCHAEOLOGICAL RESOURCES

3.4.1 Traditional Cultural Properties

In progress – BLM consultation

3.4.2 Historic, Cultural, and Archaeological Resources

3.4.2.1 Existing Conditions

SWCA conducted surveys for historic and archaeological properties in February and March 2002, July 2003, and April 2004. These surveys included all road segments for the alternatives that were carried through analysis (Road Segments 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, and 13).

Based on SWCA's studies, there are no registered historic properties or standing historical buildings or structures within or immediately adjacent to the survey corridors. Based on the same studies, one previously recorded archaeological site, seven newly discovered archaeological sites, and 19 isolated occurrences of archaeological remains occur within the survey corridors. The archaeological sites found are consistent with previous evidence for buried archaeological features exposed in local arroyos (Post, 2001) and with a historical pattern of herding and camping. Road Segment 10 of Alternatives E and F contains an archaeological site potentially eligible for the National Register of Historic Places (NRHP). Road Segment 5, used by all alternatives, contains two archaeological sites that are recommended as NRHP eligible. These three sites can be avoided by construction.

3.4.2.2 Direct Impacts of all of the Alternatives (A, B, C, D, E, F, G, and H)

Of the eight sites within the survey corridors, five are recommended as not eligible for the NRHP. One site is possibly eligible for the NRHP but can be avoided by construction, and two sites are recommended as eligible for the NRHP but can be avoided by construction. With proper planning for avoidance, no archaeological resources will be affected by construction. Table 3.13 summarizes the archaeological site information and recommendations.

Table 3.13. Summary of Archaeological Sites and Recommendations

Site	Road Segment	NRHP Eligibility Recommendation	Management Recommendation
LA 15230	1	Not Eligible	No further work
LA 135315	4, 6, 9	Not Eligible	No further work
LA 135316	5	Eligible	Design for avoidance; flag for avoidance; monitor construction
LA 135317	5	Eligible	Design for avoidance; flag for avoidance; monitor construction
LA 135317	7	Not Eligible	No further work
LA 139948	11	Not Eligible	No further work
LA 139949	10	Possibly Eligible	Design for avoidance; flag for avoidance; monitor construction
LA 139950	10	Not Eligible	No further work

3.4.2.3 Direct Impacts Associated with Alternative I (the No Action Alternative)

If the No Action Alternative is implemented, there would be no change regarding the management of archaeological properties in the project area.

3.4.2.4 Comparison of Action Alternatives

None of the alternatives will impact the known archaeological sites.

3.4.2.5 Connected Action

Additional loss of historic, cultural, and archaeological resources may result from construction of house pads and roads on the four parcels to be served by the access roads proposed under Alternatives A–H. Impacts to archaeological sites would be directly related to construction and use of housing and roads. Potential impacts would depend on the density of any subdivision of the properties. The density of subdivision will be determined by the owners, the terrain of the property, and State of New Mexico and Santa Fe County laws and ordinances. The likelihood and density of the potential subdivision of the properties is discussed in Section 3.8.1, Secondary and Cumulative Effects.

3.5 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

3.5.1 Economic Setting: Revenue Base

3.5.1.1 Existing Conditions

During the 1990s, the taxable gross receipts for Santa Fe County increased 93% for a compound annual rate of 6.8%. The City of Santa Fe's gross receipts tax base grew by 80% or a compound rate of 6.0%. Given that employment grew more in the City than in the County, these figures appear to be unreasonable, until the impact of a new law requiring gross receipts taxes on housing sales to be reported at the location of the house rather than the location of the real estate agent's office is factored into the equation. The University of New Mexico Bureau of Business Economic Research (BBER) has explored the relationship between gross receipts taxes and housing development and reports that many municipalities are in a sense addicted to growth, because up to 70% of their general fund revenues are from gross receipts taxes on housing construction. As housing starts decrease, so do gross receipts and tax revenues (UNM, 2002).

Total taxable gross receipts for Santa Fe County in 2001 were \$3,101.5 million, dominated by retail trade (\$1,289.2 million) and services (\$869.9 million), both of these components reflecting the importance of the tourist industry. While the City of Santa Fe has maintained its share of total taxable gross receipts from retail trade and services in the County, it accounts for only about half of the total taxable gross receipts from construction (UNM, 2002).

Property taxes are another component of the County revenue base. These taxes are based on assessed values, which include the value of the land and any improvements on the land. Table 3.14 presents information from the Land Activity Reports of the Santa Fe County Assessor's Office (SFC Assessor, 2003) on vacant and developed land and on land with road access and landlocked parcels. All the parcels are in Township 18 North, Range 8 East. The median value of a home in northwest Santa Fe County (Block Group 4, Census Tract 102.01) is \$512,800, which is three times the median value of \$169,100 of all houses in Santa Fe County.

Table 3.14. Property Tax Data, Land Activity Reports, Santa Fe County Assessor's Office

Parcel Location	Parcel Size	Land Use	Access	Land Value per Acre	Improvements	Year of Appraisal
Section 10, south half (L. Walker Ranch)	320.0 acres	Vacant Agr/grazing	Landlocked	\$500	None	1991
Section 10, north half (P. Ortiz Ranch)	320.0 acres	Vacant Agr/grazing	Landlocked	\$500	None	1991
Section 15 (La Luz Group Ranch)	640.0 acres	Vacant Agr/grazing	Landlocked	\$500	None	1991
Section 13 (Horcado Ranch)	53.059 acres	Vacant Agr/grazing	Horcado Ranch Road	\$1,000	None	1997
Section 16 (Santa Fe Ranch)	50.0 acres	Vacant Agr/grazing	Buckman Road	\$8,600	None	1999
Section 13 (Mariah Ranch)	4.9 acres	Single-family residential	Horcado Ranch Road	\$19,000	Single-family home	2002

3.5.1.2 Direct and Secondary Impacts Associated with Alternatives A to H

The County's revenue base is dependent on increasing property values that would be realized if access to these parcels is provided and to the gross receipts tax revenues if homes are eventually constructed. Median property values in the northwest sector are the highest in the County and are expected to continue to rise. It is likely that property values of the private lands that would be provided with roads under any of the chosen action alternatives would increase to reflect the high value of property in northwest Santa Fe County (median house value \$512,800, assessed land value with single family home at Mariah Ranch \$19,000/acre) if the development patterns in La Tierra, Las Dos, Las Campañas, and La Tierra Nueva are followed.

3.5.1.3 Direct and Secondary Impacts Associated with Alternative I (the No Action Alternative)

If Alternative I is implemented, the County revenue base would not be impacted.

3.5.1.4 Comparison of Action Alternatives

The impact to revenue base would be the same for all the *action* alternatives.

3.5.1.5 Connected Action

The revenue base available to Santa Fe County would increase with the level of subdivision in the landlocked properties. Currently, the private lands, without legal access, are assessed at \$500.00/acre. Equivalent land in the area that has been developed with a single-family home is assessed at \$19,000.00/acre. The beneficial impact to the county property tax revenue base, based on value per acre, could be \$30,400,000.00 if legal access is gained and the property is developed. This is an increase of 38 times the private properties' current worth of \$800,000.00. The amount of beneficial revenue base impact would depend on the density of any subdivision of the properties. The level of subdivision will be determined by the owners, the terrain of the property, and State of New Mexico and Santa Fe County laws and ordinances and would vary from a minimum of 11 lots (current condition) to a maximum of 128 lots (12.5 acres each). Assuming a median value of \$512,800.00 (U.S. Census 2000, for northwest Santa Fe), the aggregate values of houses that could be built on the private lands could vary from \$5,640,800.00 (11-lot minimum) to \$65,638,400.00 (128-lot maximum). The likelihood and density of the potential subdivision of the properties is discussed in Section 3.8.1, Secondary and Cumulative Effects.

3.5.2 Employment and Income

3.5.2.1 Existing Conditions

Employment in Santa Fe County has grown by almost 30% over the past 10 years, in keeping with the population growth rate. Unlike population, which grew faster in the County, jobs continue to be concentrated in the City. The top employment sectors are the services industry (30%), government (28%), and retail trade (14%). Construction employment accounted for over 7% of total employment in 2001. Combining the individual components in another way, employment related to tourism (including retail trade; arts, entertainment, and recreation; and accommodations and food service) is almost 30% of the total (NMEDD, 2000).

Non-agricultural employment has increased at a faster rate in Santa Fe County than in both the state and the nation since 1960. However, the BBER estimates that employment growth will decline from 4.0% to 2.2% during the next 8 years. Growth will occur primarily in the retail trade and services sectors, reflecting the continuing importance of tourism to the City's economic structure (UNM, 2002). In 2001, the unemployment rate was 2.6% for Santa Fe County and 2.4% for the City of Santa Fe.

The decreasing share of employees in the agriculture, forestry, fishing, and hunting category is an indication of change in Santa Fe County; this category now reflects subsistence activities rather than full-time work. In the 1990 U.S. Census, 889 persons were employed in this category. The 2001 estimates gathered by the New Mexico Department of Labor list only 194 persons in this category, a 78% decrease. The decrease is especially noticeable in the central region of the County, where small farms and ranches are being developed into home sites. The majority of the employment now seen in this category is on the few remaining large ranches in eastern Santa Fe County, south of Galisteo and north of Interstate 40.

Income statistics for Santa Fe County reflect significantly higher median household and per capita incomes than for New Mexico residents as a whole. Median household income for 1999, as presented in the 2000 U.S. Census, is \$42,207 for Santa Fe County and \$34,133 for the state. Per capita income for Santa Fe County residents was reported at \$23,594, compared to \$17,261 for the state average. UNM (2002) reports that wage and salary disbursements accounted for only 43% of the County's personal income in 1999, compared to 58% nationwide. Income in Santa Fe County is supplemented by dividends, interest, and rent (27%) and owners' income (10%). Even though the Santa Fe County per capita income is above the national average, the average wage in the County is only about 80% of the U.S. average (UNM, 2002). Median household income in northwest Santa Fe County (Block Group 5, Census Tract 102.01) is \$97,256 (U.S. Census, 2000), 2.3 times the median household income of \$42,207 for the County as a whole. Of households sampled in northwest Santa Fe County, 82% have an annual income above \$45,000, 66% have an income above \$75,000 and 17% have an income above \$200,000. In comparison, in Santa Fe County 47% of households make above \$45,000, 24% make above \$75,000 and 2% make above \$200,000.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations, requires that the effects on minority and low-income populations within a project area be given special consideration to determine if the proposed action will result in disproportionate adverse effects to their communities. Persons living at or below the poverty level are reviewed to determine if an Environmental Justice population exists within a project area. Low-income population refers to a community that is characterized as living in poverty, as determined by statistical poverty thresholds used by the U.S. Government. In 2000 the poverty-weighted average threshold was \$7,603 for a family of four and \$8,794 for an unrelated individual (U.S. Census, 2000). In Santa Fe County, 11.9% of the population is below the poverty threshold; approximately 18.4% of the state's population lives below the poverty level (U.S. Census, 2002). In comparison, 2.8% of the population of northwest Santa Fe County (Block Group 5, Census Tract 102.01) lives below the poverty level.

3.5.2.2 Direct Impacts Common to Alternatives A–H

There would be a temporary increase in construction employment if one of the action alternatives is approved for road construction. There is no low-income Environmental Justice population that would be affected. Approximately five workers would be employed for a period of 1 to 2 years under the action alternatives.

3.5.2.3 Direct Impacts Associated with Alternative I (the No Action Alternative)

If Alternative I is implemented, employment and income in Santa Fe County would not be affected.

3.5.2.4 Comparison of Action Alternatives

There is no difference among the various action alternatives in impacts to employment. The rate of construction would remain the same, and the same number of workers would be employed. The construction term would vary among the alternatives from 152 days for Alternative G to 496 days for Alternative H (Table 3.6).

3.5.2.5 Connected Action

Additional beneficial impact to employment and income may result from construction of house pads and roads on the four parcels to be served by the access roads proposed under Alternatives A–H. The amount of beneficial impact to employment and income would depend on the density of any subdivision of the properties. The level of subdivision will be determined by the owners, the terrain of the property, and State of New Mexico and Santa Fe County laws and ordinances. Between 11 and 128 new houses could be built, depending on the density of subdivision on the private lands. Construction on each house could potentially provide jobs for 10 or more workers. This impact would be variable, depending on the number of houses being built at any given time. The likelihood and density of the potential subdivision of the properties is discussed in Section 3.8.1, Secondary and Cumulative Effects.

3.5.3 Ways of Life

3.5.3.1 Existing Conditions

This section describes the culture and cultural differences among groups in Santa Fe County and compares these differences with the cultural group that currently lives in northwest Santa Fe County. Founded in 1607, Santa Fe is the second-oldest city in the United States and is the oldest capital city in America. Tourists coming to Santa Fe for its art galleries and museums, fine restaurants, and cultural attractions such as the renowned Santa Fe Opera, are also interested in the possibility of visiting nearby Indian pueblos such as Tesuque and traditional Hispanic villages such as La Cienega.

Historically, this part of northern New Mexico is characterized by its rural and agricultural nature and by Indian and Hispanic populations (Jemez y Sangre, 2002). The current tri-cultural mix of Anglo, Hispanic, and Indian populations represents a culture unique in the world. Land-based Indian and Hispanic cultures continue centuries-old traditions involving distinctive land use and settlement patterns, agricultural and irrigation practices, natural resource stewardship practices, social relations, religious activities, and architecture. Many of these traditions and practices are being lost because the tourists who are drawn here are now settling in the area, changing the demographic and income structure of the communities. The current population of northwest Santa Fe County consists predominantly of upper middle to upper class Anglo individuals who have moved to the area for quiet rural-residential living near a city that has become famous for its art and culture. Land uses in the project area and on lands next to roads that connect the project area to main feeder routes are a combination of ranching and rural residential living. The draft scoping report of public comments concerning the project is attached as Appendix A.

3.5.3.2 Secondary Impacts Common to Horcado Ranch Road Access Alternatives (Alternatives A, B, C, D, G, H)

Traffic would potentially increase on Horcado Ranch Road as a result of any development of the private properties served by the alternative roads proposed under the action alternatives in the environmental assessment. Projected traffic increases are provided in Section 3.2.7. This traffic increase may be interpreted by residents along Horcado Ranch Road and in Las Dos and La Tierra as compromising the quiet lifestyle they wish to pursue in northwest Santa Fe County. By Santa Fe County standards, lands that are developed at a density equal to or greater than 5-acre lots are considered to be rural residential (Santa Fe Northwest Advisory Council, 1997). Subdivisions (La Tierra, Las Dos, and Las Campañas) adjacent to the project area vary in lot size from 5 to 320 acres. The minimum lot size that could potentially be developed on the private properties is 12.5 acres. The rural-residential lifestyle would continue within northwest Santa Fe County under this development scenario.

3.5.3.3 Secondary Impacts Common to Buckman Road Access Alternatives (Alternatives E and F)

Traffic would increase on Buckman Road as a result of any development of the private properties served by the alternative roads proposed under the action alternatives in the environmental assessment. Projected traffic increases are provided in Section 3.2.7. This traffic increase may be interpreted by residents along Buckman Road and in La Tierra Nueva and Las Campañas as compromising the quiet lifestyle they wish to pursue in northwest Santa Fe County. By Santa Fe County standards, lands that are developed at a density equal to or greater than 5-acre lots are considered to be rural residential (Santa Fe Northwest Advisory Council, 1997). Subdivisions (La Tierra Nueva and Las Campañas) adjacent to the project area vary in lot size from 5 to 320 acres. The minimum lot size that could potentially be developed on the private properties is 12.5 acres. The rural-residential lifestyle would continue within northwest Santa Fe County under this development scenario.

3.5.3.4 Direct Impacts Associated with Alternative I (the No Action Alternative)

No impacts to ways of life would result from Alternative I.

3.5.3.5 Comparison of Action Alternatives

Impacts of all of the alternatives would be equal on a daily basis because potential traffic impacts are secondary in nature. The construction term traffic impacts would remain the same, but length of construction would vary from 157 days under Alternatives G and H to 496 days under Alternative E (see Section 3.2.7). The Horcado Ranch Road alternatives would impact the La Tierra and Las Dos subdivisions, while the Buckman Road alternatives would impact the Las Campañas and La Tierra Nueva subdivisions.

3.5.3.6 Connected Action

If the Horcado Ranch Road alternatives are adopted and the private lands are developed, increased traffic could be interpreted as impacting the rural-residential way of life in the Las Dos and La Tierra subdivisions as well as isolated rural residences that are served by Camino la Tierra and Horcado Ranch Road. If the Buckman Road alternatives are adopted and the private lands are developed, increased traffic could be interpreted as impacting the rural-residential way of life in the Las Campañas and La Tierra Nueva subdivisions as well as isolated rural residences that are served by the western portion of Paseo de la Tierra and Buckman Road. There are no residences directly adjacent to Buckman Road, Camina la Tierra, Paseo de la Tierra, Estrada Calabasa, or Horcado Ranch Road. Impacts to the rural-residential way of life include increased traffic congestion, additional noise and an increase in fugitive dust and car exhaust emissions. These effects are discussed in Sections 3.2.6 and 3.2.7

3.5.4 Population, Demographic Trends, and Environmental Justice

3.5.4.1 Existing Conditions

The total population for Santa Fe County as enumerated by the 2000 U.S. Census was 129,292. Of that total, almost 81% live in the Central Region of the County, 62% live in the Santa Fe Urban Area, and 48%, or 62,203 people, live within the City of Santa Fe. The County is growing faster (30.7%) than the State of New Mexico (20.1% between 1990 and 2000). The County is also growing faster than the City, continuing a trend first seen in 1980, when 65% of the County population lived within the City limits. In 1990, 57% of the County population lived within the City limits. Northwest Santa Fe (Block Group 5, Census Tract 102.01) is classed as a rural area by the U.S. Census. All of the people living in this area are rural-residential (definition of rural-residential is a minimum lot size of 5 acres, the minimum allowed lot size in the Basin Fringe area of northwest Santa Fe County is 12.5 acres), with the exception of 14 individuals who live on farms or ranches.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations, requires that the effects on minority and low-income populations within a project area be given special consideration to determine if the proposed action will result in disproportionate adverse effects to their communities. Almost half (49%) of the County's population report themselves as being of Hispanic or Latino origin; 45.5% report as White persons, not of Hispanic or Latino origin; and 3.1% report as American Indian and Alaska Native persons. Over 10% of Santa Fe County residents reporting on the 2000 U.S. Census are

listed as foreign born, reflecting the number of Mexican Nationals living in the area. Santa Fe County is also multilingual; only 63% of residents reporting on the 2000 U.S. Census speak only English in the home. Of the 1,262 people living in northwest Santa Fe County (Block Group 5, Census Tract 102.01) 1,058 or 82% are Anglo, 16% are Hispanic, and 1.5% are of other groups (Census 2000).

3.5.4.2 Secondary Impacts Common to Horcado Ranch Road Access Alternatives (Alternatives A, B, C, D, G, H)

There would be no effects to demographic trends under any of the Horcado Ranch Road Access alternatives (Alternatives A–D, G, H). Northwest Santa Fe County would continue to grow at its current rate (a 37% growth increase for Santa Fe County as a whole from 1990 to 2000). The subdivisions of La Tierra and Phase 1 of Las Dos are currently at 73% of total build-out. Phases 2 and 3 of Las Dos have not yet been developed (spokespersons for La Tierra and Las Dos, personal communication 24 March 2004). Development scenarios on the private lands served by the chosen alternative would have a maximum housing density no greater than that of La Tierra or Las Dos. Projected build-out indicates a growth rate greater than Santa Fe County as a whole. The greater project area is sparsely populated at the current time, and there are no residents within the BLM land that is crossed by the various alternatives. Tesuque Pueblo is near the east side of the project area, but the proposed roads will not traverse Pueblo lands.

3.5.4.3 Secondary Impacts Common to Buckman Road Access Alternatives (Alternatives E and F)

There would be no effects to demographic trends under the Buckman Road Access Alternatives (Alternatives E and F). Northwest Santa Fe County would continue to grow at its current rate (a 37% growth increase for Santa Fe County as a whole from 1990 to 2000). The subdivisions of La Tierra Nueva and Las Campañas are currently at 40% of total build-out (spokespersons for La Tierra Nueva and Las Campañas, personal communication 23 and 26 March 2004). Development scenarios on the private lands served by the chosen alternative would have a maximum housing density no greater than that of La Tierra or Las Dos. Projected build-out indicates a growth rate greater than Santa Fe County as a whole. The greater project area is sparsely populated at the current time, and there are no residents within the BLM land that is crossed by the various alternatives. Tesuque Pueblo is near the east side of the project area, but the roads will not traverse Pueblo lands.

3.5.4.4 Direct Impacts Associated with Alternative I (the No Action Alternative)

If Alternative I is implemented, there would be no effect on demographic trends.

3.5.4.5 Comparison of Action Alternatives

There is no difference in demographic trends under the various action alternatives. Northwest Santa Fe County will continue to grow at its current rate regardless of which alternative is chosen.

3.5.4.6 Connected Action

House pads and roads may be built on the four parcels being served by the roads that would be built under Alternatives A–H. The number of house pads and roads would depend on the density of any subdivision of the properties. The level of subdivision will be determined by the owners, the terrain of the property, and State of New Mexico and Santa Fe County laws and ordinances. There will be no impact to demographic trends from the various levels of subdivision. However, further subdivision and selling of the lots could ultimately have a beneficial impact on the economic condition of the Hispanic-surnamed families that own the properties. Between 11 and 128 houses could be built on the private properties. The cultural and ethnic mix of people who might occupy these houses cannot be predicted. Considering potential build-out of subdivisions in the greater project area, the growth rate of northwest Santa Fe County would not be significantly impacted by subdivision of the private properties. Build-out of current subdivisions is discussed in Sections 3.5.4.2 and 3.5.4.3. The likelihood and density of the potential subdivision of the properties is discussed in Section 3.8.1, Secondary and Cumulative Effects.

3.5.5 Community Infrastructure

3.5.5.1 Existing Conditions

The 1,262 residents (2000 U.S. Census) of the northwest sector of Santa Fe County have few community services directly available to them. Some areas have paved roads and utilities such as electricity, telephone service, and water and sewer service from the City of Santa Fe. Emergency medical, law enforcement, and fire protection services are provided to residents in northwest Santa Fe County by Santa Fe County. Response times for any emergencies are very slow, given the distance from the nearest fire station at Las Campañas. In addition, several of the developments provide private security forces. Because of its remoteness, the area is only occasionally patrolled by the BLM.

3.5.5.2 Secondary Impacts Common to Horcado Ranch Road Access Alternatives (Alternatives A, B, C, D, G, H)

There will be no impact or minimal impact to emergency medical, law enforcement, and fire protection services as a result of the construction of roads for the Horcado Ranch Road Access alternatives. If the land is subdivided and the County of Santa Fe requires it, then Horcado Ranch Road would have to be improved to meet current safety standards (no low-water crossings or grades in excess of 10%).

3.5.5.3 Secondary Impacts Common to Buckman Road Access Alternatives (Alternatives E and F)

There will be no impact or minimal impact to emergency medical, law enforcement, and fire protection services as a result of the construction of roads for the Buckman Road Access alternatives. If the land is subdivided and the County of Santa Fe requires it, then Buckman Road would have to be improved to meet current safety standards (no low-water crossings or grades in excess of 10%).

3.5.5.4 Direct Impacts Associated with Alternative I (the No Action Alternative)

There is no impact to community services under this alternative.

3.5.5.5 Comparison of Action Alternatives

There would be no difference in direct impacts to emergency medical, law enforcement, and fire protection services among the different road construction alternatives. Emergency response time to the project area or the private lands owned by the El Monte Roads Association would vary under the different alternatives. Response time could be appreciably longer under the Buckman Road alternatives, depending on where the response originated. Las Campañas Fire Station (Agua Fria Station #2) is staffed by volunteers, and only one volunteer lives in the Las Campañas area. Response times into Las Campañas are generally a minimum of 20 minutes, so response time to the project area would be an additional minimum of 40 to 60 minutes (Agua Fria Fire Station, personal communication 12 May 2004).

3.5.5.6 Connected Action

Emergency medical, law enforcement, and fire protection services may be impacted by new families moving into northwest Santa Fe County if the properties are subdivided. If the properties remain un-subdivided, then families may build on the four parcels that currently exist and would be served by the roads that would be built under Action Alternatives A–H. An additional 11 families would not strain the current community infrastructure. The conventional wisdom is that there is one ambulance call per 1,000 people every 24 hours. With a maximum possible estimated population increase of 512 people if the properties are subdivided, emergency services calls would increase by 10 or 15 times per month on average (128 lots × 4 people per household). This would cause a minimal impact to community services and would not require the building of additional police, fire, or ambulance stations. Response times would be slow (a minimum of 40–60 minutes) to the families residing on the properties. The level of subdivision will be determined by the owners, the terrain of the property, and State of New Mexico and Santa Fe County laws and ordinances. The likelihood and density of the potential subdivision of the properties is discussed in Section 3.8.1, Secondary and Cumulative Effects.

3.5.6 Land Tenure and Use

3.5.6.1 Existing Conditions

Land uses in the project area are varied. Designated land uses include rural residential, ranching, timber harvesting for firewood and small wood products such as vigas, latillas, posts, and poles, utility corridors and easements, water management (e.g., booster stations, drainages, and flood control), rangeland/agriculture, recreation/open space, and cattle grazing. The lands that are crossed by the various alternatives are used for cattle grazing, recreational open space, and, rarely, timber harvesting for firewood and small wood products. The lands adjacent to the project area include rural residences in addition to the above-mentioned uses. City of Santa Fe water wells are present along Buckman Road.

Prime farmland is defined as land suitable for the production of any food, feed, fiber, forage, or oilseed crops, and is designated by soil type (NRCS, 2002). No designated prime or unique farmlands were identified in the project area.

Indian Trust Assets or resources are defined as legal interests in assets held in trust by the U.S. Government for Indian tribes or individual tribal members. Examples of Indian Trust Assets are lands, minerals, water rights, other natural resources, money, or claims. An Indian Trust Asset cannot be sold, leased, or otherwise alienated without the approval of the Federal government (NRCS, 2002). Sacred sites, also known as traditional cultural properties, are areas designated by Indian tribes as having important religious or traditional significance. No Indian Trust Assets or traditional cultural properties have been identified in the project area.

The project area encompasses 1,600 acres in the northwest part of Santa Fe County. Currently there are 11 property owners who own a total of 11 lots, eight of them contiguous parcels held by members of one family. There are no houses or substantial improvements on these lands, which are used for grazing. Adjacent land is managed by the BLM, Tesuque Pueblo, and other private landowners.

The grazing lease on BLM land in the project area (in the portions of Sections 1 and 12 not in the Jacona Grant, Sections 11 and 14, the south half of Section 13, and the north halves of Sections 22, 23, and 24) has been held by the Ortizes since they homesteaded Sections 10 and 15 in the 1930s. The lease is held by all members of La Luz Group, LLC—Anthony and Gloria Ortiz, and also by Lillian Ortiz-Walker and Paul Ortiz, who are not members of the La Luz Group. The grazing lease-holders are applying for right-of-way to Sections 10 and 15 across much of the same BLM land that is held in the lease. This grazing lease is known as Jacona Grazing Allotment #541 (Figure 3.12).

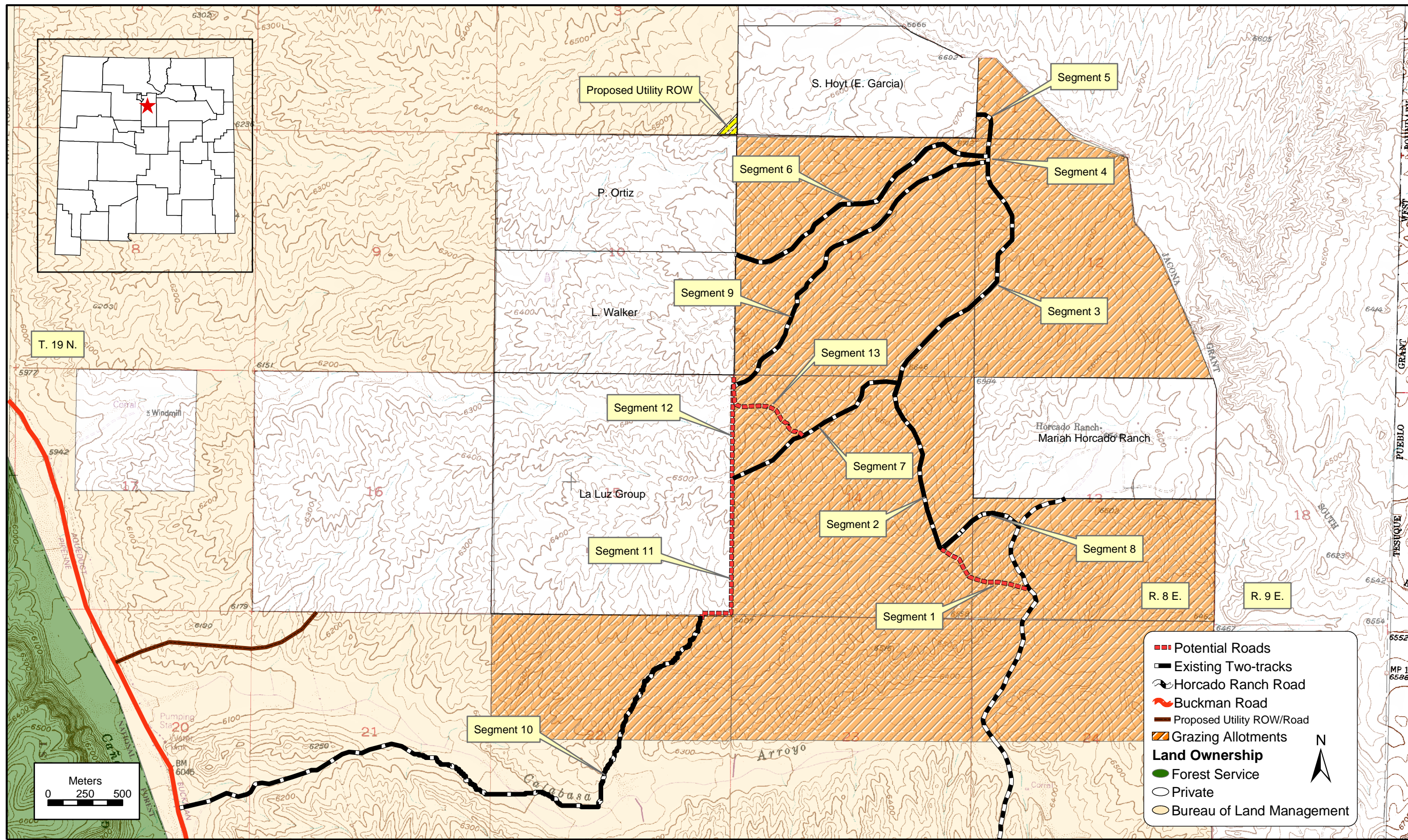
3.5.6.2 Direct Impacts Associated with Alternative A (Road Segments 1, 2, 3, 4, 5, 6, 7)

Construction Term and Roadway Margin Impacts

If Alternative A is implemented, about 22.4 acres of land would be temporarily unavailable for use for cattle grazing and recreation along the road margins because of vegetation disturbance and active construction. These margins will be revegetated.

Long-Term Roadway Impacts

If Alternative A is implemented, cattle grazing and recreational uses on the project area would continue as they have in the past. This alternative includes conversion of 7.4 acres of land use from grazing and recreation to graveled road.



Source: BLM/USGS, 2003

SWCA Environmental Consultants, 2004

Figure 3.12. Leased grazing land held by the Ortizes since the 1930s.

3.5.6.3 Direct Impacts Associated with Alternative B (Road Segments 1, 2, 3, 4, 5, 9)

Construction Term and Roadway Margin Impacts

If Alternative B is implemented, about 19.7 acres of land along the road margins would be temporarily unavailable for use for cattle grazing and recreation because of vegetation disturbance and active construction. These margins will be revegetated.

Long-Term Roadway Impacts

If Alternative B is implemented, cattle grazing and recreational uses would continue in the project area as they have in the past. This alternative includes conversion of 6.6 acres of land use from grazing and recreation to graveled road.

3.5.6.4 Direct Impacts Associated with Alternative C (Road Segments 2, 3, 4, 5, 6, 7, 8)

Construction Term and Roadway Margin Impacts

If Alternative C is implemented, about 21.3 acres of land along the road margins would be temporarily unavailable for use for cattle grazing and recreation along the road margins because of vegetation disturbance and active construction. These margins will be revegetated.

Long-Term Roadway Impacts

If Alternative C is implemented, cattle grazing and recreational uses would continue in the project area as they have in the past. This alternative includes conversion of 6.7 acres of land use from grazing and recreation to graveled road.

3.5.6.5 Direct Impacts Associated with Alternative D (Road Segments 2, 3, 4, 5, 8, 9)

Construction Term and Roadway Margin Impacts

If Alternative D is implemented, about 18.6 acres of land along the road margins would be temporarily unavailable for use for cattle grazing and recreation because of vegetation disturbance and active construction. These margins will be revegetated.

Long-Term Roadway Impacts

If Alternative D is implemented, cattle grazing and recreational uses would continue in the project area as they have in the past. This alternative includes conversion of 5.9 acres of land use from grazing and recreation to graveled road.

3.5.6.6 Direct Impacts Associated with Alternative E (Road Segments 3, 4, 5, 6, 7, 10, 11)

Construction Term and Roadway Margin Impacts

If Alternative E is implemented, about 37.8 acres of land along the road margins would be temporarily unavailable for use for cattle grazing and recreation because of vegetation disturbance and active construction. These margins will be revegetated.

Long-Term Roadway Impacts

If Alternative E is implemented, cattle grazing and recreational uses would continue in the project area as they have in the past. This alternative includes conversion of 11.3 acres of land use from grazing and recreation to graveled road.

3.5.6.7 Direct Impacts Associated with Alternative F (Road Segments 4, 5, 9, 10, 11, 12)

Construction Term and Roadway Margin Impacts

If Alternative F is implemented, about 34.3 acres of land would be temporarily unavailable for use for cattle grazing and recreation along the road margins because of vegetation disturbance and active construction. These margins will be revegetated.

Long-Term Roadway Impacts

If Alternative F is implemented, cattle grazing and recreational uses would continue in the project area as they have in the past. This alternative involves conversion of 34.3 acres of land use from grazing and recreation to graveled road.

3.5.6.8 Direct Impacts Associated with Alternative G (Road Segments 1, 2, 3, 4, 5, east half of 7, 13)

Construction Term and Roadway Margin Impacts

If Alternative G is implemented, about 17.7 acres of land along the road margins would be temporarily unavailable for use for cattle grazing and recreation because of vegetation disturbance and active construction. These margins will be revegetated.

Long-Term Roadway Impacts

If Alternative G is implemented, cattle grazing and recreational uses would continue in the project area as they have in the past. This alternative includes conversion of 6.4 acres of land use from grazing and recreation to graveled road.

3.5.6.9 Direct Impacts Associated with Alternative H (Road Segments 2, 3, 4, 5, east half of 7, 8, 13)

Construction Term and Roadway Margin Impacts

If Alternative H is implemented, about 16.7 acres of land along the road margins would be temporarily unavailable for use for cattle grazing and recreation because of vegetation disturbance and active construction. These margins would be revegetated.

Long-Term Roadway Impacts

If Alternative H is implemented, cattle grazing and recreational uses would continue in the project area as they have in the past. This alternative includes conversion of 5.7 acres of land use from grazing and recreation to graveled road.

3.5.6.10 Impacts Common to Horcado Ranch Road Access Alternatives (Alternatives A, B, C, D, G, H)

The Ortizes, who have held the grazing lease in the project area in the portions of Sections 1 and 12 not in the Jacona Grant, Sections 11 and 14, the south half of Section 13, and the north halves of Sections 22, 23, and 24 since the 1930s, are also applying for right-of-way to gain access to their landlocked property in Sections 10 and 15. There would be no impacts to land use on Paseo de la Tierra, Estrada Calabasa, or Horcado Ranch Road as a result of project construction or long-term use of the chosen alternative.

3.5.6.11 Impacts Common to Buckman Road Access Alternatives (Alternatives E and F)

The Ortizes, who have held the grazing lease in the project area in the portions of Sections 1 and 12 not in the Jacona Grant, Sections 11 and 14, the south half of Section 13, and the north halves of Sections 22, 23, and 24 since the 1930s, are also applying for right-of-way to gain access to their landlocked property in Sections 10 and 15. There would be no impacts to land use on Camino la Tierra or Buckman Road as a result of project construction or long-term use of the chosen alternative.

3.5.6.12 Direct Impacts Associated with Alternative I (the No Action Alternative)

If Alternative I is implemented, there would be no change in the existing conditions.

3.5.6.13 Comparison of Action Alternatives

The maximum amount of land use conversion, approximately 7.04 acres, would result from implementing Alternative E (Table 3.15). The minimum amount of land use conversion, approximately 3.47 acres, would result from implementing Alternative H.

3.5.6.14 Connected Action

A maximum of about 35 acres of additional land use conversion (12.5-acre lots, 128 total possible, 1/4 acre of construction/lot, 3 miles of roads to serve houses) may result from construction of house pads and roads on the four parcels to be served by the access roads proposed under Alternatives A–H. The actual amount would depend on the density of any subdivision of the properties. The conversion of grazing land to property subdivided for family homes may be considered the "highest and best possible use" of the property. The level of subdivision will be determined by the owners, the terrain of the property, and State of New Mexico and Santa Fe County laws and ordinances. The likelihood and density of potential subdivision of the properties is discussed in Section 3.8.1, Secondary and Cumulative Effects.

Table 3.15. Miles and Acreages of Maximum Temporary and Permanent Land Use Conversion, Alternatives A–I

Alternative	Miles Of Road	Temporary Land Use Removal on Roadway Margins (acres)	Permanent Land Use Conversion to Graveled Road (acres)
A (Proposed Action)	4.67	22.4	7.4
B	4.08	19.7	6.6
C	4.63	21.3	6.7
D	4.04	18.6	5.9
E	7.04	37.8	11.3
F	5.66	34.3	9.8
G	3.51	17.7	6.4
H	3.47	16.7	5.7
I	0.0	0.0	0.0

3.6 Utility Infrastructure

3.6.1. Existing Conditions

There are currently no utilities serving the landlocked private properties.

3.6.2 Secondary Impacts Common to Horcado Ranch Road Access Alternatives (Alternatives A, B, C, D, G, H)

There will be no impacts to roads or communities along Horcado Ranch Road as a result of installation of utilities along the roads constructed within Alternative A, B, C, D, G or H. Utilities would not be placed along Horcado Ranch Road or within or next to roads that would be constructed under these alternatives.

3.6.3 Secondary Impacts Common to Buckman Road Access Alternatives (Alternatives E and F)

Electrical and possibly telephone service would be tapped from lines available at Buckman Road. These utilities would be placed underground on an authorized BLM road and utilities right-of-way grant that has been developed to access Section 16. No utilities would be placed in roads that would be constructed under Alternative E or F.

3.6.4 Utility Placement

The project proponents are requesting a right-of-way in the southeast corner of Section 3 to supply Section 2 with electric and phone utilities. Other than this 400-square-foot (0.02-acre) maximum right-of-way request, utilities would be run across private lands on Sections 16, 15, and 10, and along a BLM-granted road and utility right-of-way to Section 16 from Buckman Road. The trench would be 20 feet wide by 20 feet long by a maximum 4.5 feet deep. Electric line capacity would be 135 amps. Utilities would be placed underground and would conform with guidelines set by the BLM authorized right-of-way grant to Section 16. Utilities would be buried as required by the Santa Fe Land Development Code.

3.6.5 Direct Impacts Associated with Alternative I (the No Action Alternative)

If the No Action Alternative is implemented, no utilities would be provided to private properties.

3.6.6 Comparison of Action Alternatives

There will be no difference in utility easements among the various action alternatives because the utilities will be brought in across private lands, an authorized right-of-way grant from Buckman Road to Section 16, and 400 square feet (0.01 acre) maximum of additional right-of-way at the southeast corner of Section 3.

3.6.7 Connected Action

Additional impacts to utility infrastructure may result from construction of housing served by the access roads proposed under Alternatives A–H. The amount of impact would depend on the density of any subdivision of the properties. The level of subdivision will be determined by the owners, the terrain of the property, and State of New Mexico and Santa Fe County laws and ordinances. The likelihood and density of the potential subdivision of the properties is discussed in Section 3.8.1, Secondary and Cumulative Effects.

3.7 RECREATION, SOLITUDE, AND REMOTENESS

3.7.1. Existing Conditions

Recreational users of the area include those who access lands on the mesa for rock-climbing, birding, rock-hounding, horseback riding, partying, picnicking, hunting, shooting, hiking, off-highway vehicle use, and camping. Many people drive across the mesa to get to the Rio Grande for swimming, fishing, or boating. The BLM classes the project area as Semi-Primitive. The BLM defines Semi-Primitive areas as those that are managed to provide a predominantly natural or naturally appearing environment and which provide opportunities to experience risk, solitude and naturalness. The BLM goal is to reduce the impact of surface-disturbing activities on the natural environment. Recreational activities in the Semi-Primitive zone include car camping, off-road vehicle touring, backpacking, hiking, horseback riding, nature study, and scenery viewing (BLM, 1988).

Firearms are commonly used in the project area. Scattered shell casings along with broken bottles and other targets characterize several popular shooting locations. It is illegal to leave targets and shell casings on BLM lands. Concerns have been raised for public safety caused by shooting at signs and at undesignated shooting ranges.

Tetra Tech, Inc., interviewed travelers on Buckman Road at Wild Rivers on Tuesday August 27 and Sunday September 15, 2002. Recreation users on Buckman Road were sight-seeing, hiking, going on a drive, going to the Rio Grande River, rock climbing at Diablo, shooting, collecting rocks, and using ATVs (Tierra LopezGarcia Group, 2003). Several locations in the project area attract partygoers. Haphazardly constructed fire rings generally identify these locations, along with bottles, cans, and other party litter. Party caravans using the Buckman Road corridor are often destined for Caja del Rio (Diablo) Canyon. Sites along the Rio Grande at the terminus of Buckman Road are also popular destinations, and others are scattered randomly along the mesa.

Additional recreational locations and increases in vandalism/illegal dumping, woodcutting, and off-highway vehicle use are evident within the project area.

3.7.2 Direct Impacts Associated with Alternative A (Road Segments 1, 2, 3, 4, 5, 6, 7)

Construction Term and Roadway Margin Impacts

If Alternative A is implemented, construction activities associated with building the road would increase the concentration of the sights and sounds of human activities along 4.24 miles of existing roads and 0.43 mile of new road in the project area.

Long-Term Roadway Impacts

If Alternative A is implemented, the sights and sounds of human activity would be increased along 4.67 miles of roads which would trisect the project area, fragment its remoteness and solitude, and make it harder for the BLM to meet the goals for its Semi-Primitive designation of the area. However, the improved roads would be constructed along existing two-tracks, with the exception of 0.43 mile of new road at Road Segment 1.

3.7.3 Direct Impacts Associated with Alternative B (Road Segments 1, 2, 3, 4, 5, 9)

Construction Term and Roadway Margin Impacts

If Alternative B is implemented, construction activities would increase the concentration of the sights and sounds of human activities along 3.65 miles of existing roads and 0.43 mile of new road in the project area.

Long-Term Roadway Impacts

If Alternative B is implemented, the sights and sounds of human activity would be increased along 4.08 miles of roads that would bisect the project area, fragment its remoteness and solitude, and make it harder for the BLM to meet the goals for its Semi-Primitive designation of the area. However, the improved roads would be constructed along existing two-tracks, with the exception of 0.43 mile of new road at Road Segment 1.

3.7.4 Direct Impacts Associated with Alternative C (Road Segments 2, 3, 4, 5, 6, 7, 8)

Construction Term and Roadway Margin Impacts

If Alternative C is implemented, construction activities would increase the concentration of the sights and sounds of human activities along 4.63 miles of existing roads in the project area.

Long-Term Roadway Impacts

If Alternative C is implemented, the sights and sounds of human activity would be increased along 4.63 miles of roads that would trisect the project area, fragment its remoteness and solitude, and make it harder for the BLM to meet the goals for its Semi-Primitive designation of the area. However, the improved roads would be constructed along existing two-tracks.

3.7.5 Direct Impacts Associated with Alternative D (Road Segments 2, 3, 4, 5, 8, 9)

Construction Term and Roadway Margin Impacts

If Alternative D is implemented, construction activities would increase the concentration of the sights and sounds of human activities along 4.04 miles of existing roads in the project area.

Long-Term Roadway Impacts

If Alternative D is implemented, the sights and sounds of human activity would be increased along 4.04 miles of roads that would bisect the project area, fragment its remoteness and solitude, and make it harder for the BLM to meet the goals for its Semi-Primitive designation of the area. However, the improved roads would be constructed along existing two-tracks

3.7.6 Direct Impacts Associated with Alternative E (Road Segments 3, 4, 5, 6, 7, 10, 11)

Construction Term and Roadway Margin Impacts

If Alternative E is implemented, construction activities would increase the concentration of the sights and sounds of human activities along 6.33 miles of existing roads and 0.71 mile of new road in the project area.

Long-Term Roadway Impacts

If Alternative E is implemented, the sights and sounds of human activity would be increased along 7.04 miles of roads that would trisect the northeastern part of the project area, bisect the southwestern part of the project area, fragment its remoteness and solitude, and make it harder for the BLM to meet the goals for its Semi-Primitive designation of the area. However, 6.33 miles of improved roads would be constructed along existing two-tracks, with the exception of 0.71 mile of new road along Road Segment 11.

3.7.7 Direct Impacts Associated with Alternative F (Road Segments 4, 5, 9, 10, 11, 12)

Construction Term and Roadway Margin Impacts

If Alternative F is implemented, construction activities would increase the concentration of the sights and sounds of human activities along 4.56 miles of existing roads and 1.1 miles of new road in the project area.

Long-Term Roadway Impacts

If Alternative E is implemented, the sights and sounds of human activity would be increased along 5.66 miles of roads that would bisect the northeastern part of the project area, bisect the southwestern part of the project area, fragment its remoteness and solitude, and make it harder for the BLM to meet the goals for its Semi-Primitive designation of the area. However, about 4.56 miles of these roads would be constructed along existing two-tracks, with the exception of 1.1 miles of new road at Road Segments 11 and 12.

3.7.8 Direct Impacts Associated with Alternative G (Road Segments 1, 2, 3, 4, 5, east half of 7, 13)

Construction Term and Roadway Margin Impacts

If Alternative G is implemented, construction activities would increase the concentration of the sights and sounds of human activities along 2.62 miles of existing roads and 0.85 mile of new road in the project area.

Long-Term Roadway Impacts

If Alternative G is implemented, the sights and sounds of human activity would be increased along 3.51 miles of roads that would bisect the project area, fragment its remoteness and solitude, and make it harder for the BLM to meet the goals for its Semi-Primitive designation of the area. The new roads would be constructed along existing two-tracks, with the exception of 0.85 mile of new road at Road Segments 1 and 13.

3.7.9 Direct Impacts Associated with Alternative H (Road Segments 2, 3, 4, 5, east half of 7, 8, 13)

Construction Term and Roadway Margin Impacts

If Alternative H is implemented, construction activities would increase the concentration of the sights and sounds of human activities along 3.01 miles of existing roads and 0.46 mile of new road in the project area.

Long-Term Roadway Impacts

If Alternative H is implemented, the sights and sounds of human activity would be increased along 3.47 miles of roads that would bisect the project area, fragment its remoteness and solitude, and make it harder for the BLM to meet the goals for its Semi-Primitive designation of the area. The new roads would be constructed along existing two-tracks, with the exception of 0.46 mile of new road at Road Segment 13.

3.7.10 Secondary Impacts Common to Horcado Ranch Road Access Alternatives (Alternatives A, B, C, D, G, H)

Construction of graveled roads through the project area that will be accessed via Horcado Ranch Road may increase recreational traffic along Camino la Tierra, Paseo de la Tierra, Estrada Calabasa, and Horcado Ranch Road. Initially activities such as off-road vehicle use, partying and shooting would probably increase as the area would become more accessible. Later on, as people built house on the private properties served by the roads, this activity would probably decrease.

3.7.11 Secondary Impacts Common to Buckman Road Access Alternatives (Alternatives E and F)

Construction of graveled roads through the project area that are reached by Buckman Road may increase recreational traffic along Camino la Tierra and Buckman Road.

3.7.12 Direct Impacts Associated with Alternative I (the No Action Alternative)

If Alternative I is implemented, there would be no impacts to recreation, solitude, or remoteness.

3.7.13 Comparison of Action Alternatives

The most road miles impacting the remoteness and solitude of the area would occur with the alternatives that use Road Segments 6 and 7 and/or originate at Buckman Road (Alternatives A, 4.67; C, 4.63; E, 7.04; F, 5.66). Alternatives A, C, and E in combination with Road Segments 1–5 would trisect the main body of the project area. Alternatives B, D, G, and H would bisect the project area. Alternative F would create one road that follows a northerly route from Buckman Road to Section 2. Alternatives G and H would bisect the project area but would create the least road miles impacting the project area (3.51 and 3.47, respectively).

3.7.14 Connected Action

Additional impacts to recreation, solitude, and remoteness may result from construction of house pads and roads on the four parcels to be served by the access roads proposed under Alternatives A–H. Approximately 2.6% of the land area would be constructed with roads and houses under the highest possible density of housing (12.5-acre lots). The amount of impact would depend on the density of any subdivision of the properties. The level of subdivision will be determined by the owners, the terrain of the property, and State of New Mexico and Santa Fe County laws and ordinances. The likelihood and density of the potential subdivision of the properties is discussed in Section 3.8.1, Secondary and Cumulative Effects.

3.8 SECONDARY AND CUMULATIVE IMPACTS OF THE PROPOSED ACTION

3.8.1 Secondary and Cumulative Effects

Other projects that are currently taking place or are under review on BLM lands in or adjacent to the project area include the Buckman Wells and Buckman Diversion projects. Both of these projects impact Buckman Road. Improvement to Buckman Road itself has also been proposed. Construction traffic on Buckman Road and Camino la Tierra would increase as these projects are built. Improvement to Buckman Road may encourage further development of private lands that are served by this road. Maintenance traffic on Buckman Road would increase after the projects are built out. These projects do not impact Paseo de la Tierra, Estrada Calabasa, or Horcado Ranch Road. Both Buckman Road and Horcado Ranch Road connect to Camino la Tierra. At this time there are no known projects other than providing the members of the El Monte Roads Association with access to their private lands that would affect Horcado Ranch Road. If Buckman Road is used as the access, cumulative impacts would result from providing this access, as well as to the Buckman Wells and Buckman Diversion projects. At this time, Buckman Road does not carry any residential traffic. Camino la Tierra would be impacted regardless of the alternative chosen to provide access to lands owned by members of the Association.

3.8.1.1 Cumulative Impacts to Recreation and Semi-Primitive Designation

The greatest cumulative impacts to the recreation objectives of the Semi-Primitive designation of these BLM lands would occur with four alternatives: Alternative A, 4.67 miles of improved and new roads; Alternative C, 4.63 miles of improved and new roads; Alternative E, 7.04 miles of improved and new roads; and Alternative F, 5.66 miles of new and improved roads. The more miles of road that are developed in the project area, the less Semi-Primitive the area would become.

3.8.1.2 Cumulative Impacts to Water Resources

The Buckman Wells and Buckman Diversion projects will provide water to Santa Fe County, including subdivisions that are currently being built out (La Tierra, La Tierra Nueva, Las Campañas, and Las Dos) and any new phases or subdivisions in northwest Santa Fe County. The landowners who compose the El Monte Roads Association have senior water rights and thus are guaranteed water from the Sangre de Cristo Water Association if wells drop because of pumping the Buckman Wells. Guaranteed water availability allows for the possibility of denser subdivisions at the 12.5-acre/lot (128 lot) maximum density of private lands served by the road alternatives proposed in this environmental assessment. The water can also secure complete build-out of all subdivisions that currently exist. Along Horcado Ranch Road, La Tierra has 68 of 100 lots occupied and Las Dos has 15 of 22 lots occupied in Phase 1. Phases 2 and 3 of Las Dos have not yet been developed. Along Buckman Road and Camino la Tierra, Las Campañas has 1,230 lots, of which 1,014 are sold and 467 have houses built on them. Las Campañas would also secure water for a golf course with the Buckman Diversion project. La Tierra Nueva has 50 of 63 lots occupied.

3.8.1.3 Cumulative Impacts to Solitude and Remoteness

Solitude and remoteness would decrease on BLM lands due to the cumulative impacts of all projects that are currently planned. The Semi-Primitive designation of these lands would continue to be compromised by the combined impacts of these projects. Class III visual objectives would not be compromised if all currently planned projects are implemented. Wildlife would be cumulatively impacted by potential increased traffic and traffic noise on Buckman Road and/or Horcado Ranch Road from the projects that are currently proposed.

3.8.1.4 Cumulative Impacts to Traffic

Traffic could increase a maximum of 11.6 times the current weekday traffic counts on Horcado Ranch Road and 36 times the traffic-counter average on Buckman Road if the lands belonging to the El Monte Roads Association are fully developed. This maximum projected traffic increase would be added to maintenance traffic on Buckman Road if the Buckman Wells and Buckman Diversion projects are implemented. Full build-out of current subdivisions would also increase these traffic counts, 1.5 times along part of Buckman Road and Camino La Tierra, and 0.5 times along Estrada Calabasa, Paseo de la Tierra, and Camino la Tierra with full La Tierra and Las Dos Phase 1 build-out. Traffic increases on Paseo de la Tierra with the build-out of Phases 2 and 3 of Las Dos are unknown.

Traffic noise increase would be variable depending on the terrain, with maximum noise increases related to 38 times the amount of traffic on Camino la Tierra or 12.1 times the amount of traffic on Paseo de la Tierra, not including the build-out of Phases 2 and 3 of Las Dos. Rural ways of life in communities along Buckman Road would be impacted by maintenance traffic from the Buckman Wells and Buckman Diversion projects, as well as the El Monte Roads project if Alternative E or F of the action alternatives is built. Rural ways of life along Horcado Ranch Road and Estrada Calabasa would be impacted by increased traffic if Alternative A, B, C, D, G or H of the El Monte Roads action alternatives is chosen. Rural ways of life along Paseo de la Tierra could be impacted by Alternatives A–D, G, and H, plus increased traffic from build-out of Las Dos and La Tierra. No houses are directly adjacent to any of the roads in the greater project area.

3.8.1.5 Cumulative Impacts to Soil

The potential development that could be supported with additional water from the Buckman Wells and Buckman Diversion projects could accelerate soil loss in the area from higher-density build-outs of subdivisions. The maximum possible build-out on the private lands provided by roads under the action alternatives (12.5-acre minimum lots and assuming 1/4 acre of construction per lot) would put 32 acres under impervious surfaces. Runoff from these surfaces could increase soil erosion on the private lands of El Monte Roads Association members. Build-out on other subdivisions in the area could increase this effect.

3.8.1.6 Secondary Effects

Secondary effects to resources on private lands and adjacent BLM lands would occur under Alternatives B, D, F, G, and H because of the need to provide a minimum 0.5 mile of road to the P. Ortiz property across the L. Walker property directly adjacent to Section 11 of BLM land. This would be new road with a 50-foot right-of-way, and disturbance would be 132,000 square feet (3 acres). There would be potential impacts to topography, soils, water resources, visual resources, vegetation, wildlife habitat, sensitive species, cultural resources, recreation, solitude, and remoteness.

Secondary and cumulative effects to resources may result from construction of house pads and roads on the four parcels to be served by the access roads proposed under Alternatives A–H. The amount of impact would depend on the density of any subdivision of the properties. The level of subdivision will be determined by the owners, the terrain of the property, and State of New Mexico and Santa Fe County laws and ordinances. The most likely minimum subdivision of the four parcels that is practicable, due to the rough terrain, is lots of 20 acres each. Santa Fe County ordinances stipulate a minimum subdivision of 12.5 acres based on water availability in the northwest sector (Santa Fe County, 1996). The project area is in the Basin Fringe zoning area (Emilio Gonzalez, Santa Fe County Land Use Planner, personal communication 10 March 2004). If the land is subdivided into 20-acre parcels, impacts could occur from vehicles traveling across the project area to and from 80 lots. If the land is subdivided into 12.5-acre parcels, then impacts could occur from vehicles traveling across the project area to and from 128 lots. Santa Fe County safety standards stipulate that only 30 dwellings can be placed at dead-end roads or properties that have only one access road (Article 5, Santa Fe County Land Development Code). With this

restriction, a total of 90 houses could be developed on Sections 2, 10 and 15 under Alternatives A, C, and E. Only 60 houses, total, could be placed on the private lands under Alternatives B, D, F, G, and H. Subdivisions cannot be placed on roads with grades in excess of 10% or with temporary drainage crossings. The fire marshal reviews subdivision master plans and may limit the development of the properties to family transfer exemptions, if a Horcado Ranch Road access (Alternatives A, B, C, D, G, and H) is chosen and Horcado Ranch Road is not upgraded to eliminate any temporary drainage crossings or potential grades greater than or equal to 10%. In this case, no subdivision would be possible on the private land served by these roads (Emilio Gonzalez, Santa Fe County Land Use Planner, personal communication 10 March 2004). The authority to control the minimum level of subdivision that could occur on the four parcels resides with the State Engineer's Office (for water availability), Santa Fe County, and various county authorities such as the Fire Department, and is beyond the scope of this project and outside of the BLM's authority.

Anticipating that a minimum of 11 lots would be improved by family members on the private lands once access is acquired, the two-way 24-hour average daily traffic (ADT) would be 55 vehicles per day on Buckman or Horcado Ranch Road. The top traffic volume based on 80 lots of 20 acres each, the level of subdivision projected by the project engineer given the rough terrain, would be 440 vehicles per day. If problems with rough terrain could be overcome and the maximum density of a 12.5-acre per lot subdivision realized, then 128 lots would be possible, yielding a potential of 704 vehicles traveling Buckman Road or Horcado Ranch Road per day. These figures are based on statements in the POD (Walbridge, 2001) and Santa Fe Model Trip Generation Standards (Pitts, 2002). Additional traffic would potentially cause further erosion and washboarding on Horcado Ranch Road or Buckman Road. Horcado Ranch Road is classed as a sub-collector road based on the existing and potential houses that are or could be served by this route (Santa Fe County, 1986). Buckman Road is a county road that is currently used for recreation and maintenance traffic and would be classed as a local road.

3.8.2 Summary of Alternative Effects

This narrative summary is also available in table format (Table 2.2, end of Chapter 2). Alternative E would be the most expensive to build, at \$2,575,132. Alternative D would be the least expensive, at \$974,152. Alternatives A, C, and E allow access to all four private properties and share the cost equitably among the families. Alternatives B, D, F, G, and H do not allow access across BLM land to the P. Ortiz property (north half of section 10). The cost of building the road from the east corner of Sections 10 and 15 to the P. Ortiz property would be \$105,200. The dam in the southwest quarter of Section 11 needs to be stabilized for safety purposes if Alternative E, F, G, or H is built. The cost of dam stabilization to prevent the potential breach of an earthen stock reservoir in the southwest corner of Section 11 is \$100,000. Alternative G and H would also require a floodplain crossing that would cost \$80,000.00 (Louis Berger Group, personal communication 3 May 2004).

Alternative E requires building 4.67 miles of road. Alternative H requires building 3.47 miles of road. Alternatives C and D would be built solely on existing two-tracks. Roads would be built across undisturbed terrain under Alternatives A, B, E, F, G, and H. Alternative F would require 1.1 miles of new road, Alternative G would require 0.85 mile of new road, and Alternatives A and B would require 0.43 mile of new road. Construction term disturbance would be a maximum of 37.8 acres under

Alternative E and a maximum of 16.7 acres under Alternative H. Permanent roadway acreage would be 11.3 acres under Alternative E and 5.7 acres under Alternative H. These acreages also hold for soil disturbance, permanently buried soils, and land use conversion.

Thirty-three hills and arroyos would have to be stabilized by construction under Alternative F. Only 14 hills and arroyos would need to be stabilized by construction mitigation under Alternative G. Approximately 915 feet of arroyo would have to be crossed under Alternative F. About 691 feet of arroyo would have to be crossed under Alternative D, and about 381 feet under Alternatives A and C. Major arroyos (in excess of 100 feet) are crossed under all alternatives. Calabasa Arroyo, a 250-foot-wide arroyo and mapped floodplain area, would require a \$1,000,000 bridge crossing under Alternatives E and F. FEMA-mapped floodplains at a tributary of the Cañada Ancha would have to be crossed by Alternatives E, F, G, and H. One homeowner, on the north half of Section 13, would see road traffic on all alternatives except Alternative F. None of the alternatives would conflict with Class III visual objectives. Construction would be accomplished at the same rate under all alternatives and would involve approximately 16 worker trips/day. The construction term within the BLM lands would be approximately 496 days under Alternative E, 261 days under Alternative F, 209 days under Alternative A, and 152 days under Alternative G.

The project area has had a severe die-off of piñon trees. Up to 514 dead trees would have to be removed under Alternative E. Up to 237 dead trees would be removed under Alternative F. A maximum of 20.16 acres of piñon-juniper woodland habitat would be removed in road margins under Alternatives A, D, E, and F. A maximum of 9.85 acres of piñon-juniper habitat would be removed in road margins under Alternative B. A maximum of 10.17 acres of piñon-juniper habitat would be permanently covered by roadways under Alternative E. A maximum of 2.95 acres of piñon-juniper habitat would be covered by roadways under Alternative D. A maximum of 10.3 acres of juniper savanna habitat would be removed in road margins under Alternative F. A maximum of 2.13 acres of juniper savanna habitat would be removed in road margins under Alternative C. A maximum of 3.3 acres of juniper savanna habitat would be permanently covered by roadways under Alternative B. A maximum of 0.67 acre of juniper savanna habitat would be covered by roadways under Alternative C. There would be no significant impact to wildlife or special status species under any of the alternatives. There would be no impact to archaeological resources or traditional cultural properties as long as mitigation measures in Chapter 4 are implemented under the action alternatives. Socioeconomic impacts would be the same under all alternatives. Rural ways of life in La Tierra and Las Dos and the rural residences along Horcado Ranch Road would be impacted by Alternatives A–D, G, and H. Ways of life in La Tierra Nueva and Las Campañas would be impacted by Alternatives E and F. Community services would not be immoderately impacted under any of the alternatives. If the land is subdivided and Santa Fe County requires it, then Horcado Ranch Road or Buckman Road would have to be upgraded, with no low-water crossings or grades in excess of 10% for safe ingress and egress of emergency services vehicles when they are needed. Semi-Primitive area objectives, solitude, and remoteness would be affected by construction and improvement of 7.04 miles of road on BLM lands under Alternative E and construction and improvement of 3.47 miles of road on BLM lands under Alternative H. Utilities would be brought in across private lands, authorized BLM right-of-way, and 400 square feet of right-of-way in the southeast corner of Section 3. This route does not affect the proposed action alternatives (A–H). Table 2.2 in Chapter 2 summarizes the comparison of effects.

4.0 ENVIRONMENTAL COMMITMENTS TO MINIMIZE POTENTIAL ADVERSE EFFECTS

Section 4.0 is a contract between the Bureau of Land Management and the El Monte Roads Association. The Association and its contractors would be responsible for fulfilling these commitments under the action alternatives (Alternatives A–H).

4.1 RESOURCES FOR WHICH NO COMMITMENTS ARE NEEDED BECAUSE THERE WILL BE NO IMPACTS

There will be no impacts to mineral resources (BLM, 2004), wetlands, riparian zones, wild or scenic rivers, or Indian Trust Assets resources as a result of the proposed alternatives.

4.2 LAND RESOURCES

4.2.1 Topography, Geology, and Climate

Best Management Practices would be followed to prevent erosion where cuts and fills are necessary along the roads of the chosen alternative. Revegetation will be undertaken on all cut-and-fill areas. Best Management Practices will include preserving vegetative buffer areas, use of silt fencing and other erosion control devices, and tree preservation where practical. A revegetation and landscaping plan would have to be submitted to the BLM prior to commencement of any construction work. The BLM would monitor construction activities through the life of the project. The El Monte Roads Association would be responsible for post-construction road maintenance and would maintain the roads to prevent serious erosional problems.

4.2.2 Geology and Soils

Care would be taken during construction to minimize impacts to vegetation and soil. All non-essential construction and crew vehicles would be parked on established roadways whenever possible. Efficient and well-planned construction techniques would be used to help limit the amount of vehicular disturbances in the project area. Soils would be well-compacted immediately following construction operations, and the area would be seeded and mulched to help accelerate soil stabilization processes. Silt fencing or other erosion control measures would be erected along roads to stem storm water runoff. Wherever possible vegetation would be preserved along the roads, within right-of-way boundaries. If and when the BLM authorizes right-of-way under one of the action alternatives, Best Management Practices would be specified as part of the right-of-way contract (Appendix B, Right-of-Way Authorization Contract). The El Monte Roads Association would be responsible for post-construction road maintenance and would maintain the roads to prevent serious erosional problems.

4.2.3 Water Resources

Siltation can be greatly reduced by using siltation-control techniques and thoroughly compacting all soils following construction. All construction vehicles would be inspected for leaking hydraulic or fuel lines and care would be taken to avoid spillage during refueling and refilling

operations. All scraps and waste materials would be removed from the construction sites. The U.S. Army Corps of Engineers will be notified of the proposed action to obtain Clean Water Act permitting in jurisdictional waters. The BLM Taos Field Office hydrologist and engineer will review arroyo crossing plans to assure that culverts and crossings will not increase channel degradation in arroyos. State of New Mexico and Santa Fe County codes would be followed to protect groundwater resources.

4.2.4 Floodplains

There are no wetlands in the project area. Floodplains would be protected with Best Management Practices such as silt fences and maintenance of vehicles to avoid spills of oil or fuel if an alternative that crosses these floodplains is chosen. If one of the Buckman Access Alternatives is chosen, a bridge will be built across the Calabasa Arroyo floodplain, thus avoiding floodplain impacts at this site. If Alternative E, F, G, or H is implemented, then a safe floodplain crossing would have to be implemented at Road Segment 12/13 at the crossing of a tributary of the Cañada Ancha.

4.2.5 Visual Resources

Visual resources would be impacted by implementation of the action alternatives. The objectives of the BLM designation as Semi-Primitive would be compromised by the implementation of the action alternatives. Only BLM-approved vegetation plans, seed choices, riprap, and potential bridge materials would be used in construction of the alternatives.

4.3 AIR QUALITY AND NOISE

Fugitive dust generation would be effectively controlled by water-spraying of the immediate construction site once per day or at the frequency required by the BLM. Dirt piles would be watered down or covered with plastic sheeting, per BLM requirements, to prevent fugitive dust from affecting air quality. Under extremely windy conditions (wind speeds greater than 30 miles per hour), construction activities would be curtailed. Exhaust emissions for construction and maintenance vehicles are regulated or exempted from regulation by existing air-quality regulations, and these vehicles would be tested to ensure compliance. Further, unnecessary idling of vehicles would be prohibited during periods of air stagnation such as those that typically occur during night and early morning hours. The foreman of the road construction crew would monitor and control unnecessary idling of vehicles.

All construction equipment would have working mufflers. Work hours would be limited to the period between 7 a.m. and 7 p.m. Vehicular traffic on the constructed roads resulting from the connected action would be less than the 48.6 dB maximum permitted in Semi-Primitive Non-Motorized areas. No long-term mitigation measures are necessary.

4.4 TRAFFIC

The contractor will file a traffic safety plan with the BLM and Santa Fe County clearly detailing what traffic safety measures will be taken. These measures could include flagmen, traffic safety signs, safety striping, flashers, and barricades. Special precautions will be taken at night to ensure that vehicles do not drive into areas where construction is taking place. If it becomes necessary

to obstruct traffic, sufficient signage and advance notification would be provided by the road construction contractor to warn and assist ranchers and motorists. Construction would take place only between the hours of 7 a.m. and 7 p.m. Semi-truck traffic carrying gravel or bridge parts would be active only between 7 a.m. and 7 p.m.

4.5 LIVING RESOURCES

4.5.1 Vegetation

To minimize vegetation losses, only the areas actually needed for construction would be cleared. The unnecessary removal of any trees would be avoided. The BLM would set the criteria for removal, and the road construction contractor foreman would monitor and control the removal or transplanting of trees. Care would be taken to replace the seed-bearing topsoil after construction has been completed. The regeneration processes would be expedited by stabilizing the replaced topsoil with an organic mulch. Seed-bearing topsoil would be removed upon initial blading and stockpiled so that it could be placed back on disturbed areas to provide a seed bank for revegetation. BLM stipulations regarding topsoil preservation would be followed. Only BLM-approved vegetation and seeding plans would be implemented. The BLM would set the criteria for topsoil removal and stockpiling, and the contractor would assure that the BLM criteria would be applied during road construction.

4.5.2 Wildlife

No construction would take place outside of the authorized right-of-way. The land within the right-of-way would be cleared only as necessary to avoid undue harassment of and harm to wildlife. The Migratory Bird Treaty Act of 1918 provides for the protection of migratory birds from harassment, harm, or harvest. To protect nesting migratory birds from construction impacts, avoidance measures would be implemented. Pre-construction vegetation clearing would be scheduled before 15 April or after 15 August. If construction cannot be scheduled to avoid potential impacts, a pre-construction nesting bird survey or construction monitoring would be implemented. If nesting migratory birds are found in the area of impact, coordination with the Taos BLM wildlife specialist would be undertaken to determine the most suitable mitigation measures. All unnecessary removal of trees would be avoided. The BLM would stipulate trees to be protected within the road margins.

4.5.3 Special Status Species

Santa Fe cholla. No further consideration of this species is recommended.

Santa Fe milkvetch. The Santa Fe milkvetch is a State Species of Concern and is not legally protected. At the discretion of the State of New Mexico or other regulatory agencies, it may be necessary to conduct a species-specific survey for this plant during the growing season. If such a survey is not required, the Forestry Division of the New Mexico Environmental Department and the Taos BLM Biologist would be notified if this species is encountered during construction activities.

Texas horned lizard. If present during construction, Texas horned lizard would be moved off of the immediate project area. The USFWS and the Taos BLM Biologist would be contacted if this species is encountered in the area.

Loggerhead shrike. The recommendations for migratory birds in Chapter 3 would be followed. The USFWS and the Taos BLM Biologist would be notified if this species is seen nesting in the general project area.

4.6 TRADITIONAL CULTURAL PROPERTIES; HISTORIC, CULTURAL, AND ARCHAEOLOGICAL RESOURCES

4.6.1 Traditional Cultural Properties

BLM is consulting with potentially affected pueblos and tribes regarding possible traditional cultural properties in the project area.

4.6.2 Historic, Cultural, and Archaeological Resources

The three sites that are recommended as eligible or possibly eligible would be flagged for avoidance before construction. Once construction begins, if previously unknown archaeological remains (including human remains) are encountered, work in that area would be halted and the BLM Taos Field Office Archaeologist would be contacted immediately.

4.7 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Impacts to socioeconomics and environmental justice are beneficial or neutral. No mitigation measures are necessary.

4.7.1 Employment and Income

Impacts to employment and income are beneficial or neutral. No mitigation measures are necessary.

4.7.2 Housing

Impacts to housing are beneficial or neutral. No mitigation measures are necessary.

4.7.3 Ways of Life

The construction or improvement of any roadway is bound to be beneficial for some individuals and viewed as detrimental by others. The Horcado Ranch Road action alternatives (Alternatives A–D, G, and H) would increase traffic on Horcado Ranch Road, Estrada Calabasa, and Paseo de la Tierra, which would affect homeowners in La Tierra and Las Dos and rural residences along Horcado Ranch Road. The Buckman Road alternatives (Alternatives E and F) would increase traffic along Camino la Tierra and Buckman Road, which would affect homeowners in La Tierra Nueva and Las Campañas. The BLM will consider the comments of all interested parties in choosing a road development alternative.

4.7.4 Demographic Trends and Environmental Justice

There would be no effect to demographic trends or environmental justice. No mitigation measures are necessary.

4.7.5 Community Infrastructure

The emergency services departments in the local community would not be significantly impacted by the chosen alternative. No mitigation measures are necessary. If the connected action includes development of land, the emergency services departments would decide at that time whether they need to locate services closer to the communities that would be developed.

4.8 LAND USE

Lands on the roadway margins would be revegetated to match the existing vegetation type except where planting of trees or tree seed would be inadvisable because of safety concerns. The amount of acreage that would permanently change from other uses to roadway would be minimal. No other mitigation measures are necessary.

4.8.1 Utility Infrastructure

Revegetation would take place after utilities were placed in 400 square feet of the southeast corner of Section 3. Only BLM-approved vegetation and seeding plans would be implemented.

4.8.2 Grazing

Construction workers and other personnel would watch for and avoid livestock while working within, accessing, or leaving the project area. The amount of acreage that would permanently change from grazing to permanent road would be minimal. No other mitigation measures are necessary.

4.8.3 Recreation, Solitude, and Remoteness

Increased traffic would negatively affect Semi-Primitive and open space values. There would be a provision in the BLM right-of-way contract to allow the road construction contractor temporary access onto the right-of-way. By issuing the right of way contract, the BLM would authorize the construction, improvement, and maintenance of the access roads.

5.0 CONSULTATION AND COORDINATION

5.1 PUBLIC SCOPING

A public scoping meeting was held at the Las Campañas Firehouse from 5:30 p.m. to 7:30 p.m. on February 5, 2003. This meeting was publicized in *Journal North*, the *Santa Fe New Mexican*, the *Los Alamos Monitor*, letters to concerned parties, fliers placed in public places, and radio spots. A scoping period followed, which was extended through March 2003. Comments were received after this date. The scoping report is provided in Appendix A. A follow-up meeting to explain the NEPA process was held on April 17, 2003. Letters to advertise the follow-up meeting were sent to parties who had attended the February 5 scoping meeting and had sent in responses during the scoping period.

5.2 PERSONNEL

Claudia Oakes, Managing Principal, SWCA
Kevin Wellman, Archaeologist, Project Manager, SWCA
Nancy Kastning, Botanist, Project Manager, SWCA
Mike Balistreri, Biologist, Project Manager, SWCA
David Barz, GIS Coordinator, SWCA
Joseph Fluder, GIS Specialist, SWCA
Billy Crews, CADD Specialist, SWCA
David Phillips, Archaeologist, Program Director, SWCA
Cheryl Wase, Archaeologist, Project Manager, SWCA
Mary Quirolo, Archaeologist, Tribal Consultation Specialist, SWCA
Jean Ballagh, Technical Editor, SWCA
Linda Judd, Office Manager, Report Production, SWCA
Ron Huntsinger, Field Manager
Herbert Chavez, Engineer
Sharon Churchill, NEPA Specialist, BLM
Greg Gustina, Hydrologist
Hal Knox, Realty Specialist, BLM
Sam DesGeorges, Multi-Resource Manager
Tami Torres, Recreation Specialist, BLM
Paul Williams, Archaeologist, BLM

5.3 PERSONS AND AGENCIES CONSULTED

5.3.1 Federal Agencies

U.S. Fish and Wildlife Service
U.S. Army Corps of Engineers

5.3.2 Tribes

Hopi Tribe
Nambé Pueblo
Pojoaque Pueblo
San Ildefonso Pueblo
San Juan Pueblo
Santa Clara Pueblo
Tesuque Pueblo

5.3.3 State Agencies

New Mexico Department of Game and Fish
Forestry Division, New Mexico Department of Energy, Minerals and Natural Resources
New Mexico Historic Preservation Department
New Mexico State Lands Office

5.3.4 County Agencies

Santa Fe County Land Use Department
Santa Fe County Public Works Department

5.3.5 Individuals

Mr. John Fox
Ms. S. "Zannie" Hoyt
Mr. Anthony Ortiz
Mr. Paul Ortiz
Mr. Clif Walbridge
Ms. Lillian Walker

6.0 LITERATURE CITED

- Bahm, R.J., L.W. Crow, E.K. Fosdick, K.W. Haggard, W.S. Morris. 1985. New Mexico Climate Manual. New Mexico Energy Research and Development Institute Report 72-4523. ixi+601 pp.
- BLM. 2004. Mining Claim Report. Viewed 8 April 2004 at: <http://nirm0nils.corp.blm.gov/ods-nsapi/ods.ods?Method=login&Username=internetuser&Password=internetuser&HTMLFile=%22classic%2Fpostlogon.html%22&JScript=enable>
- BLM. 2003. City of Santa Fe Buckman supplemental Well Environmental Assessment. USDI Bureau of Land Management and Bureau of Reclamation: Washington D.C.
- BLM. 1988. Taos Resource Management Plan. USDI Bureau of Land Management: Washington, D.C.
- BLM. 1986a. Visual Resource Inventory, BLM Manual Handbook 8410-1. USDI Bureau of Land Management: Washington, D.C.
- BLM. 1986b. Visual Resource Contrast Rating, BLM Manual Handbook 8431-1. USDI Bureau of Land Management: Washington, D.C.
- Degenhardt, W.G., C.W. Painter, and A.H. Price. 1996. The Amphibians and Reptiles of New Mexico. xix+431 pp.
- Dick-Peddie, W.A. 1993. New Mexico Vegetation, Past, Present, and Future. University of New Mexico Press: Albuquerque. xxx +244 pp.
- EPA. 2002. AIRdata database. U.S. Environmental Protection Agency: Washington, D.C.
- EPA. 1974. EPA Identifies Noise Levels Affecting Health and Welfare. Viewed March 2004 at: <http://www.epa.gov/history/topics/noise/01.htm>
- Federal Emergency Management Agency (FEMA). 1988. Flood Insurance Rate Maps, Panels 75, 100, 150 and 175. FEMA: Washington, D.C.
- Green, G.N., and G.E. Jones. 1994. Digital Geologic Map of New Mexico in ARC/INFO Format; 1:500,000. U.S. Geological Survey, New Mexico Bureau of Mines and Mineral Resources: Washington, D.C.
- Jemez y Sangre. 2002. White Paper, Alternative: Utilize San Juan–Chama Water, Jemez y Sangre Water Plan Alternatives Assessment Charrette, February 2002.
- Maker, H.J., H.E. Dregne, V.G. Link, and J.U. Anderson. 1978. Soils of New Mexico. New Mexico State University Agriculture and Experimentation Station Research Report. 285:1-132. NMSU: Las Cruces.

- Morain, S.A., T.K. Bridge, and M.E. White. 1977. *Vegetation and Land Use in New Mexico*. New Mexico Institute of Mining and Technology, Bureau of Mining and Mineral Resources Resource Map 8.
- NMDGF. 2000a. *Biota Information System of New Mexico Species Account 041750 – Loggerhead Shrike*. New Mexico Department of Game and Fish: Santa Fe.
- NMDGF. 2000b. *New Mexican Wildlife of Concern. BISON-M, Biota Information System of New Mexico*. New Mexico Department of Game and Fish: Santa Fe.
- NMRPTC. 2000. *New Mexico Rare Plant Technical Council – New Mexico Rare Plants Database*.
- NRCS. 2002. *Prime and Unique Farmland*. Viewed April 2004 at: <http://www.nm.nrcs.usda.gov/technical/fotg/section-1/references/ENV1PUFa.doc>
- Pitts, A. 2002. *Memorandum Trip Generation Rates and Traffic Counts (revision of the Santa Fe Regional Transportation Model)*. Al Pitts: Santa Fe.
- Post, Stephen S. 1994. *An Archaeological Survey of 20.5 Ha at the Confluence of Cañada Ancha and the Rio Grande at White Rock Canyon for Hydrological Testing by Las Campañas de Santa Fe, on Santa Fe National Forest Land in Santa Fe County, New Mexico*. *Archaeology Notes* 161. Office of Archaeological Studies, Museum of New Mexico: Santa Fe.
- Santa Fe County. 1996. *Santa Fe County Land Development Code*. Board of County Commissioners; Santa Fe.
- Santa Fe Northwest Advisory Council. 1997, revised 1998. *Santa Fe Northwest Sector Plan*. Santa Fe Northwest Advisory Council: Santa Fe.
- Sivinski, R., and K. Lightfoot. 1995. *Inventory of Rare and Endangered Plants in New Mexico*. New Mexico Forestry and Resources Conservation Division, Energy, Minerals and Natural Resources Department: Santa Fe.
- Soil Conservation Service. 1975. *Soil survey: Santa Fe area, New Mexico (Santa Fe County and part of Rio Arriba County)*. U.S. Department of Agriculture, Natural Resources Conservation Service: Washington D.C.
- SWCA. 2002. *Biological Evaluation Report of Proposed Improvements to 4.4 Miles of Existing Roads and the Proposed Construction of 0.7 Miles of New Roadway in Santa Fe County, New Mexico*. SWCA: Albuquerque.
- Tierra LopezGarcia Group. 2003. *The Buckman Roadway Study for the Buckman Water Diversion Project, Santa Fe, New Mexico*. Draft. Tierra LopezGarcia Group: Santa Fe.
- U.S. Census. 2000. *2000 Census figures viewed February 2003 at: <http://www.census.gov>*

- U.S. Fish and Wildlife Service (USFWS). 2000. New Mexico County List – Endangered, Threatened, and Candidate Species and Species of Concern. U.S. Fish and Wildlife Service, New Mexico Ecological Services Field Office.
- University of New Mexico (UNM). 2002. New Mexico Population Projections by County, Bureau of Business and Economic Research, University of New Mexico. Viewed August 2002 at: [HTTP:// www.unm.edu/~bber/demo/table1.htm](http://www.unm.edu/~bber/demo/table1.htm)
- Walbridge and Associates. 2001. Plan of Development for Access Roads to Four Properties. Walbridge and Associates: Santa Fe.
- Williams, J.L., Editor. 1986. New Mexico in Maps. University of New Mexico Press, Albuquerque.
- Wilson, B. C., A. A. Lucero, J. T. Romero, and P. J. Romero. 2000. Water Use by Categories in New Mexico Counties and River Basins, and Irrigated Acreage in 2000. New Mexico Office of the State Engineer: Santa Fe.