Chapter 2. Alternatives Including the Proposed Action

2.1 Introduction

This chapter describes the two alternatives analyzed in this EA. Alternative A is the no action alternative. Alternative B is the proposed action. Following the alternative descriptions section, the decision making process is described.

2.2 Description of the Alternatives

2.2.1 Alternative A: No Action

Under this alternative, the proposed action would not be constructed and no other measures, except routine operations and maintenance (O & M) would be taken to prevent erosion at the RM 114 and 113 priority sites. Other ongoing O & M activities in the area generally consist of mowing the vegetation along the bankline slopes of the LFCC and levee and maintaining the condition of the access roads.

2.2.2 Alternative B: Proposed Action

Reclamation proposes to construct a new levee and LFCC alignment from a point on the levee and LFCC located approximately 1.6 mi. downstream of the SADD to a point approximately 3.4 mi. downstream of the SADD. The new alignment would be constructed approximately 1,500 feet (ft.) west of the existing alignment as shown in Figure 2 below. The total length of the new alignment would be approximately 10,800 ft. Construction would take approximately three years to complete.

Construction of the new levee and LFCC would be carried out in three segments: a north segment, a central segment, and a south segment. The central segment would consist of a single, 584 ft. long, 9.0 ft. diameter reinforced concrete pipe (RCP), with support earthwork and concrete, riprap placed at the inlet and outlet of the pipe, and a sheetpile drop structure to stop head cutting of the San Lorenzo Arroyo, coming from the direction of the river.

The sheetpile drop structure would consist of four rows of sheetpiles driven to a depth of 25 ft. and spaced 30 ft. apart. There would be a 6.0 ft. drop in elevation between each row and the sides of the structure would be enclosed by sheetpiles. Riprap and earthen fill material would be placed between the rows of sheetpiles. Local groundwater would be removed and discharged into either the Lemitar Riverside Drain, the existing LFCC, or into a temporary holding pond to allow the water to be used for construction. The maximum size of the holding pond would be 1.0 acre and 5.0 ft. deep. An overflow pipe would be installed to protect the pond from overflow damage.

The north and south segments would consist of the new LFCC and levee from their connection with the existing LFCC and levee, up to the point where they each would connect to the pipe in the central segment. The bottom width of the new LFCC would be 28.1± ft. and would have 2:1 side slopes up to the original ground level. The riprap protection would be to a depth of 6.0 ft. with a thickness of 11 inches (in.).

During the first two months of construction, the construction limits of the existing LFCC and the centerline of the new LFCC alignment would be surveyed and staked. Following the new centerline, the construction easement for the new alignment would be surveyed and staked. The construction easement would extend 100 ft. from the centerline on the west side of the new LFCC and 250 to 275 ft. from the centerline on the east side. Haul roads for each segment would be surveyed and staked 25 ft. on each side of their centerlines.

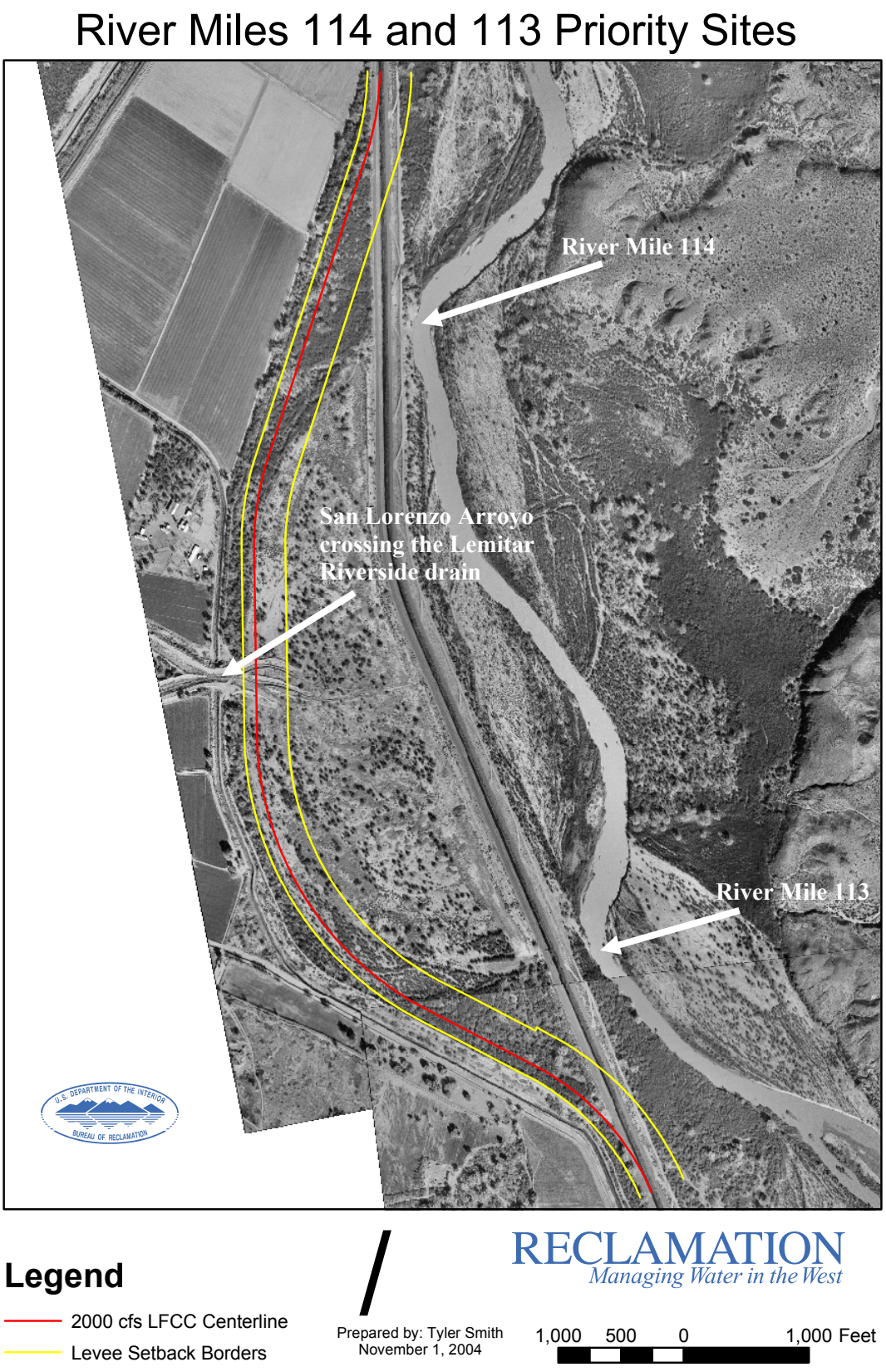

Figure 2. Aerial view of the project area and proposed new alignment of the levee and LFCC.

A staging area would be surveyed and staked out near each haul road. Two stockpiling areas, one on each side (east and west) of the central haul road would also be surveyed and staked out. Existing jetty jacks along a 1,000 ft. segment of the existing LFCC and levee on the east side would be removed. The jetty jacks would be removed in order to allow the existing levee to be used as fill material for the existing LFCC. Table 1 below presents more specific details of the new LFCC alignment, haul roads, staging and stockpiling, and jetty jack removal areas. Figure 3 below shows their proposed locations.

Table 1. Easement details of the new LFCC alignment, haul roads, staging, stockpiling, and jetty jack removal areas.

Alignment	**Offset Distance From Centerline Looking Upstream**	
	Left	**Right**
Realigned LFCC	100.0 ft. 100.0 ft.	275.0 ft. 250.0 ft.
Existing LFCC	215.0 ft.	215.0 ft.*
Feature	**Easement Description**	
North Haul Road	25.0 ft. left & right of centerline	
Central Haul Road	25.0 ft. left & right of centerline	
South Haul Road	25.0 ft. left & right of centerline	
Staging Area #1**	475.0 ft. by 315.0 ft. in size Located at east entrance of the South Haul Road	
Staging Area #2**	400.0 ft. by 325.0 ft. in size Located at west entrance of the Central Haul Road	
Staging Area #3**	400.0 ft. by 265.0 ft. in size Located at east entrance of the North Haul Road	
Stockpile Area #1	300.0 ft. by 250.0 ft. in size Located at east entrance of the Central Haul Road	
Stockpile Area #2	300.0 ft. by 325.0 ft. in size Located at west entrance of the Central Haul Road	
Jetty Jack Removal Area	All jetty jack tie back lines within 50.0 ft. of the east levee embankment toe will be removed. The estimated length = (65.0*24.0) 1,560 ft.. The complete jetty jack tie back and double main lines located up to 360.0 ft. east of the existing LFCC alignment from a point 2.1 mi. south of the SADD to a point 2.3 mi. south of the SADD shall be removed. The estimated length = ((175*6)+(785*2)) 2,620 ft.. The removal will required a construction easement of 30.0 ft. left and right of centerline of each jetty jack tie back or main lines.	

* The construction easement will be which ever is greater between 215 ft. from existing LFCC centerline or 50.0 ft. from existing east levee embankment toe.

** Staging areas may be used for storing or stockpiling construction materials.

All vegetation would be removed and chipped within the construction easement of the new LFCC alignment. Chipped vegetation and roots would be spread out along the existing ground surface and not piled higher than 12 in. The removal of existing Rio Grande cottonwood trees (*Populus deltoides* ssp. *wislizeni*) would be minimized during vegetation removal from the existing LFCC alignment, jetty jack removal area, staging areas, haul roads, and stockpile areas as required to perform construction operations.

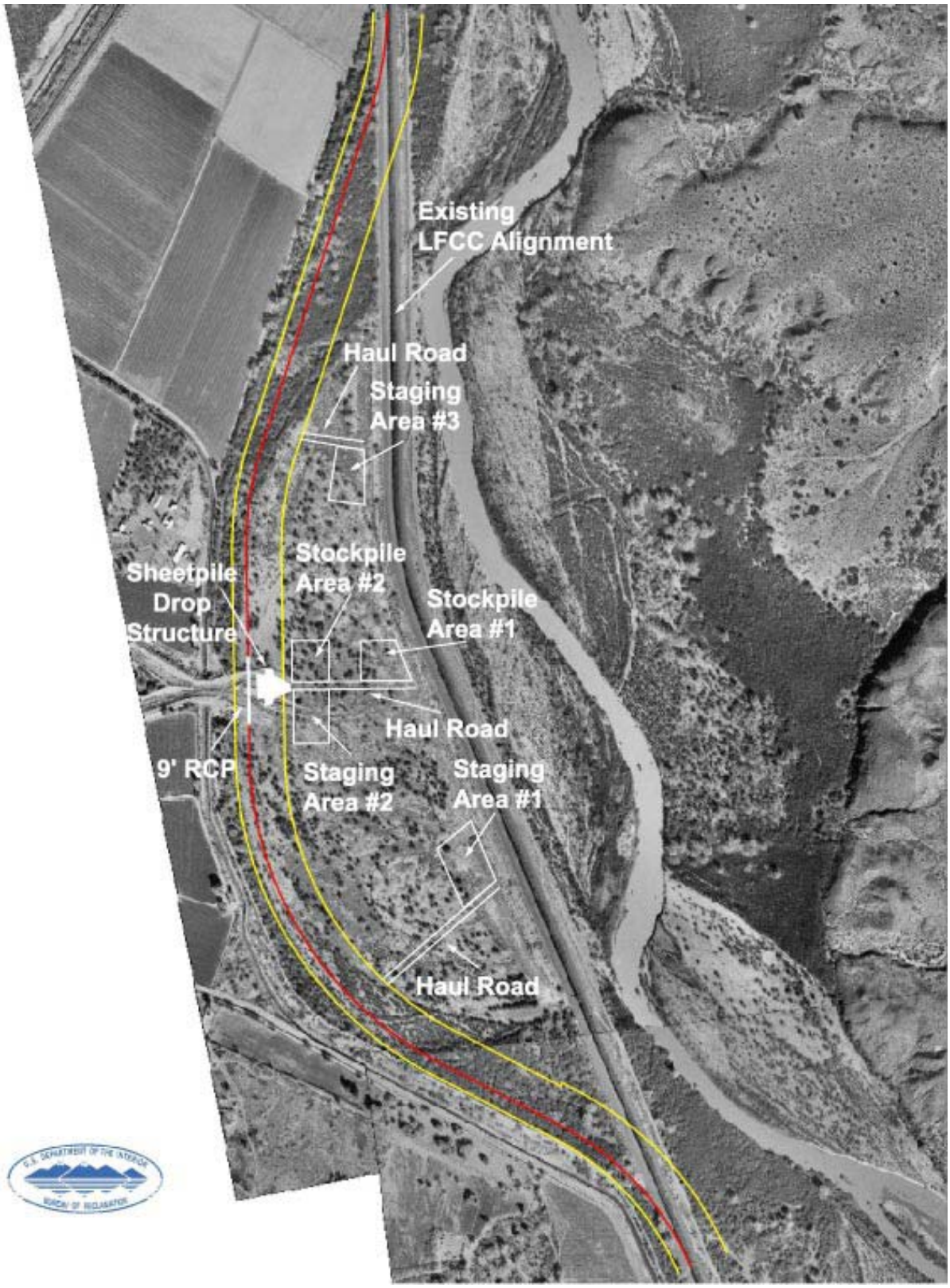

Figure 3. Aerial view showing the locations of the proposed new LFCC alignment, haul roads, staging, and stockpiling areas, sheetpile drop structure and the RCP.

The grubbing of vegetation along the existing LFCC alignment, jetty jack removal area, staging areas, haul roads, and stockpile areas would be performed to limit interference with construction operations and protect equipment tires.

The existing LFCC would be mowed in accordance with regular operations and maintenance activities. Fish barriers would be placed just outside the project limits in the LFCC to prevent any fish from moving into the project area during construction. After mowing, the riprap that currently lines the channel of the LFCC would be removed and stockpiled for use at the base of the new levee and at the sheetpile drop structure. Any remaining riprap would be used either along the east slope of the new levee or in the channel of the new LFCC alignment.

Additional riprap would be hauled in from three existing Reclamation stockpiles. One stockpile is located just north of the project area between Interstate 25 and the Socorro Main Canal. Approximately 1,050 truck loads of riprap would be transported to the site by following the canal road north to the railroad crossing over the LFCC, then following the LFCC access road south into the project area. Another stockpile is located just south of the project area on the west side of the LFCC near Rio Grande RM 111. This stockpile, known as the "Polvadera" stockpile, would supply approximately 150 truck loads of riprap for the proposed project. The LFCC access road would be followed from the stockpile to the project area. A third stockpile is located at the Red Canyon Mine, south of Socorro. Approximately 1,800 truck loads of riprap would be brought in from this stockpile using a route that takes I-25 north to Escondida, then follows the Socorro Ditch over to the LFCC and turns north on the LFCC access road to the project area. The riprap hauling would require approximately 15 months, spread out over the estimated three year construction period.

Up to four temporary road crossings may be constructed on the existing LFCC. These crossings would be used by equipment to access both sides of the channel. Each crossing would have a minimum top width of 24 ft. and be constructed with a 36 in. diameter metal culvert in the bottom of the channel to allow water to flow past. One crossing would have a top width of 36 ft. and would be used as a location for water pumping. A rock embankment would be placed downstream of the crossing to allow the water in the channel to pond to a depth required for pumping.

Water required for construction activities would preferably come from the LFCC and dewatering operations. Additional water could be acquired from the Middle Rio Grande Conservation District or other sources. The estimated volume of water that would be required for construction is 32 acre-ft. per year [0.2 cubic feet per second (cfs) per 10 hour day].

Access roads would be constructed on both sides of the new LFCC and would be 24.0 ft. wide. Drainage ditches would be located adjacent to the access roads. Twelve inch diameter culvert drain inlets would be located approximately every 1,000 ft. along the drainage ditches. The drainage ditches would be shaped with 2:1 side slopes, a bottom width between 2.0 and 10 ft., an average depth of 2 ft., and would be sloped toward the corrugated metal pipe (CMP) drain inlets.

A low-water crossing would be constructed across the San Lorenzo Arroyo to allow low-boy trailers to move equipment upstream and downstream along the realigned LFCC. The low-water crossing would be 24 ft. wide with 10:1 side slopes. Compacted road base material with a thickness of 12 in. would be placed on the road surface of the low water crossing. Figure 4 below shows where work would take place in the San Lorenzo Arroyo.

The new levee would be constructed from material excavated from the new alignment of the LFCC. The levee would be constructed on the east side of the realigned LFCC. The new levee would be approximately 16 ft. high from the original ground surface with 2:1 side slopes on the west and 3:1 side

slopes on the east side. Permanent levee ramps would be constructed on the west side of the new levee at a maximum of 500 ft. intervals. Temporary levee ramps (to be removed after construction) would be located on the east side of the existing and new levees at a maximum of 500 ft. intervals.

Prior to construction of the central segment, the San Lorenzo Arroyo would be diverted around the south side of the construction area. To accomplish this, the culvert in the Lemitar Riverside Drain that passes under the San Lorenzo Arroyo would be extended an additional 80 ft. southward and covered with earthen fill material (Figure 5, below). A temporary channel and an earthen berm would be constructed to redirect flows in the arroyo away from the construction area.

After construction of both the RCP crossing and sheet pile drop structure, the San Lorenzo Arroyo channel flows would be directed through the sheet pile drop structure. The added pipe and earth fill in the Lemitar Riverside Drain would be removed after construction is complete.

Figure 4. View of the San Lorenzo Arroyo where the low-water crossing and the new RCP would be placed.

The USGS cableway over the existing LFCC alignment may be removed and stored by Reclamation. Two metal culverts that drain into the existing LFCC would be removed and backfilled. One of these culverts is a 60 in. diameter pipe that drains the San Lorenzo Arroyo. Once construction of the new LFCC and levee alignment is completed, water flow in the existing LFCC would be redirected into the new LFCC by backfilling the existing LFCC with material from the existing levee. Table 2 below presents the estimated areas of disturbance and construction quantities for the proposed action.

Figure 5. View of the Lemitar Riverside Drain where the culvert would be temporarily extended during construction.

Table 2. Estimated Areas of Disturbance and Construction Quantities.

DESCRIPTION	QUANTITY	UNITS
Vegetation Removal (New Areas):		
New LFCC Alignment (10,800 ft. by 375 ft.)	93.0	acres
Staging Area One (475 ft. by 315 ft.)	3.4	acres
Staging Area Two (400 ft. by 325 ft.)	3.0	acres
Staging Area Three (400 ft. by 265 ft.)	2.4	acres
Stockpile Area One (300 ft. by 250 ft.)	1.7	acres
Stockpile Area Two (300 ft. by 325 ft.)	2.2	acres
Haul Road "North" (455 ft. by 50 ft.)	0.5	acres
Haul Road "Center" (956 ft. by 50 ft.)	1.1	acres
Haul Road "South" (802 ft. by 50 ft.)	0.9	acres
Total Vegetation Removal	108.2	acres
Vegetation Removal (Existing Areas):		
Existing LFCC Alignment (9,650 ft. by 282 ft.)	62.5	acres
Jetty Jack Tie Back Removal (9,650 ft. by 15 ft.)	3.3	acres
Jetty Jack Tie Back & Main Lines Removal (1,841 ft. by 60 ft.)	2.5	acres
Vegetation Removal (Mowing Existing LFCC)		
Existing LFCC Alignment (9,650 ft. by 148 ft.)	32.8	acres

Table 2. Estimated Areas of Disturbance and Construction Quantities, continued.

DESCRIPTION	QUANTITY	UNITS
Excavation:		
Removal of Topsoil New LFCC.	130,000.0	cu. yds.
New LFCC 2,000 cfs channel.	535,000.0	cu. yds.
9.0 ft. diameter RCP at San Lorenzo Arroyo*.	1,500.0	cu. yds.
Sheetpile Drop Structure.	45,000.0	cu. yds
Estimated Total Excavation	711,500.0	cu. yds.
Removal of existing Rio Grande levee.	242,000.0	cu. yds.
Removal of existing San Lorenzo Arroyo embankment	60,000.0	cu. yds.
Temporary Road Crossing(s)		
Earth Fill	1,800.0	cu. yds.
Riprap Fill	1,250.0	cu. yds.
Diversion and Care of San Lorenzo Arroyo:		
Volume of earth to be moved (temporary fill)	46,000.0	cu. yds.
New Riprap:		
2,000 cfs Channel to 6.0 ft.	16,000.0	cu. yds.
Inlet & Outlet of RCP.	1,200.0	cu. yds.
Drop Structure.	4,250.0	cu. yds.
Salvage Riprap from existing LFCC	30,100.0	cu. yds.
Backfill:		
Existing LFCC.	356,000.0	cu. yds.
Reshaping of San Lorenzo Arroyo.	112,000.0	cu. yds.
New spoil levee.	451,000.0	cu. yds.
Compacted Backfill:		
CMP Drain Inlets.	500.0	cu. yds.
9.0 ft. diameter RCP at San Lorenzo Arroyo.	24,000.0	cu. yds.
Fill into existing LFCC at alignment change.	21,000.0	cu. yds.
Road Base:		
O&M access roads.	24,000.0	cu. yds.
San Lorenzo Arroyo embankments.	1,500.0	cu. yds.
San Lorenzo Arroyo low water crossing.	500.0	cu. yds.

* Excavation does not include channel excavation through structure.

2.3 Post Construction Site Restoration Activities

A key project objective is to restore the Rio Grande's active floodplain to a more natural condition by moving the LFCC and levee to the west, thus allowing the river to migrate laterally over time without being confined by the man-made structures. This in itself is expected to result in improved riverine and riparian conditions within this river reach.

To provide for more immediate habitat replacement, Reclamation has developed the following mitigation plan to offset the effects associated with the clearing of native vegetation within the project area. The proposed action would result in the removal of approximately 286 cottonwoods and 76 Goodding's willow trees (*Salix gooddingii*) that are in various age classes and conditions and located outside of the river's floodplain. Figure 6 below shows a portion of the LFCC in the foreground and provides some idea of the vegetative appearance of the settling basin.

To offset the effects of this vegetation removal, Reclamation proposes to plant both species listed above within the river floodplain at an elevation conducive to establishment and survivability and within two wetland habitat enhancement features. Replacement ratios would be consistent with general Service recommendations based on habitat value. In addition, habitat enhancement features would be developed within the existing LFCC that would provide riparian and wetland habitat components. Project related soil disturbance areas (staging areas, temporary access routes, stockpile sites, etc.) would be reseeded with native grasses and shrubs.

Figure 6. View to the west of the LFCC (foreground) and the San Lorenzo Arroyo settling basin beyond.

Mitigation ratios were derived from general Service recommendations not specific to this project. Regarding impacts to riparian vegetation (ex. coyote willow), the Service recommends a 2:1 replacement. The replacement ratio for mature trees is a minimum 10:1, i.e., 10 saplings planted for each mature tree. The Service provides no specific guidance for replacement ratios of less healthy trees or younger trees. So, to reflect the relatively lower value of less healthy and/or younger trees a ratio of 2:1 and 5:1 was used, respectively. Tables 3 and 4 below present the recommended replacement values for cottonwood and Goodding's willow trees affected by the proposed project.

Table 3. Cottonwood replacement quantities.

Tree Condition	Number of Trees Removed		Replacement Ratio		Number of Replacement Trees
Mature healthy	86	@	10:1	=	860
Mature unhealthy	47	@	5:1	=	235
Young healthy	116	@	5:1	=	580
Young unhealthy	37	@	2:1	=	93
Total trees removed:	286		Total trees planted:		1,768

Table 4. Goodding's willow replacement quantities.

Tree Condition	Number of Trees Removed		Replacement Ratio		Number of Replacement Trees
Mature healthy	23	@	10:1	=	230
Mature unhealthy	24	@	5:1	=	120
Young healthy	10	@	5:1	=	50
Young unhealthy	19	@	2:1	=	48
Total trees removed:	76		Total trees planted:		448

Mitigation for removal of vegetation on this project would take place in two forms (Figure 7). First, the remaining unfilled portions of the LFCC would be converted into two wetland habitat enhancement features. These features, which are designed to take advantage of groundwater in the present LFCC, would be 500 and 1,000 ft. long and approximately 120 ft. wide at ground surface (Figures 8 and 9) for a total area of approximately 4.0 acres. These depressions would have gradually-sloping transitions (12:1) on the north and south ends and steeper slopes along their sides (3:1). Existing coyote willows and young cottonwoods found at the lower elevations of the LFCC would be left in place for continued growth to provide habitat within these newly developed features. Figure 9 below shows what the existing LFCC looks like.

The second vegetation mitigation feature would consist of two areas of cottonwood and Goodding's willow pole plantings on floodplain terraces adjacent to the Rio Grande (Figure 7) where conditions are good for their establishment and survivability. The northern site is approximately 16 acres and the southern site covers 11 acres.

As shown in Tables 3 and 4, a total of 1,768 cottonwoods and 448 Goodding's willows would be planted in the mitigation areas. Because the density and mix of these plantings would depend upon conditions in the field and the location of existing vegetation, the exact densities of trees would be determined at the time of planting. It is expected that the development of the planted cottonwood stands would add to the extent and value of the native cottonwood gallery forest while the vegetated wetland depressions (former LFCC sections) would provide unique wildlife habitat, particularly for wetland-obligate organisms.

After completion of earthwork and general soil disturbance in the project area, a mix of native grass seeds and shrubs would be applied to these disturbed-soil areas. Depending upon availability, the species would consist of blue grama (*Bouteloua gracilis*), sideoats grama (*Bouteloua curtipendula*), Indian ricegrass (*Achnatherum hymenoides*), streambank wheatgrass (*Elymus lanceolatus*), galleta grass (*Pleuraphis jamesii*), alkali sacaton (*Sporobolus airoides*), sheep fescue (*Festuca ovina*), little bluestem (*Schizachyrium scoparium*), and fourwing saltbush (*Atriplex canescens*).

Figure 7. Location of vegetation mitigation features at San Acacia.

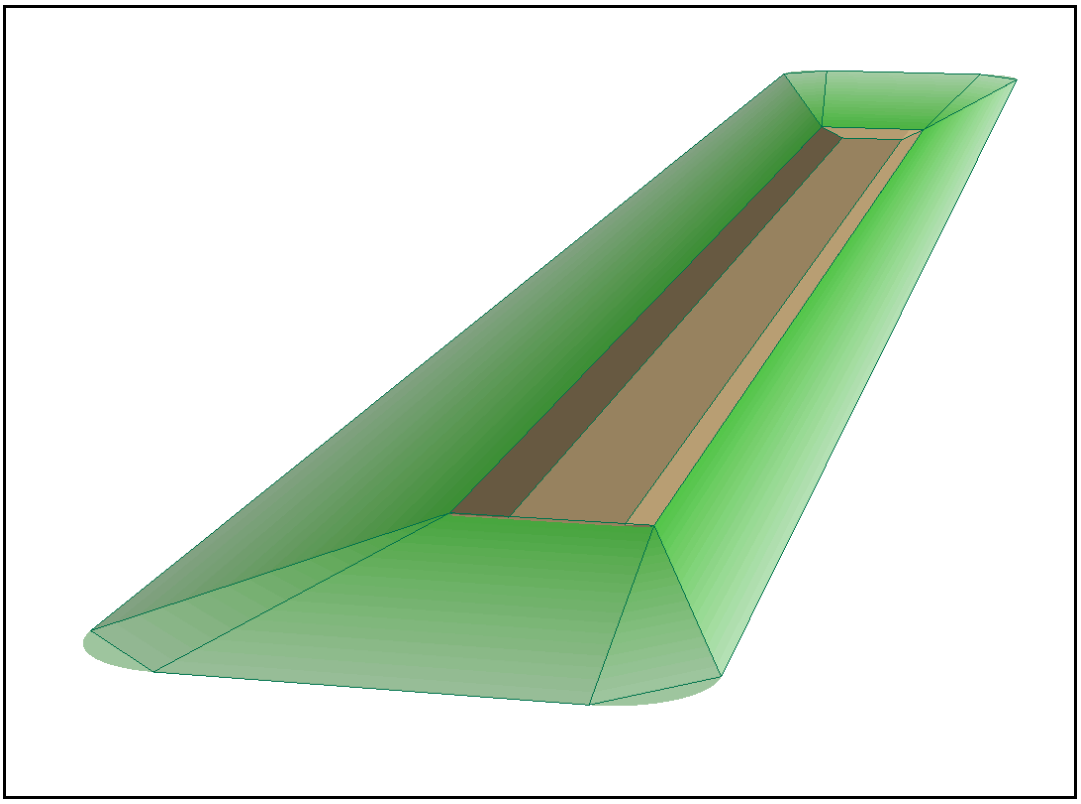

Figure 8. Schematic of habitat enhancement feature.

Figure 9. Photograph of the LFCC looking north. Young willows and cottonwoods are already present.

Monitoring would be a critical component to the success of the vegetation mitigation by providing information for future management activities. Examining the success of plantings, concurrent with natural vegetation recruitment and community succession, would take place annually for a period of five years. Reclamation biologists would inspect the sites to assess the success of the vegetation plantings and their utilization by wildlife. Should a large number of the pole plantings die, consideration would be given to replacing the dead trees in order to achieve the original mitigation objectives.

2.4 Alternatives Considered but Eliminated From Further Study

Several alternatives for protecting riverside facilities at San Acacia were considered (Reclamation, 2004b). During the alternative selection process, three different alternatives were analyzed, Levee Setback, Riprap Revetment, and River Realignment. It was shown that all three were acceptable options based on engineering principles and each had a comparable equivalent annual cost.

A meeting was held with the project team to determine the preferred alternative. Each of the team members provided input as related to their field of expertise. Rio Grand Silvery Minnow, Southwestern Willow Flycatcher, Lands Interest, Cultural Resources, Reliability, Feasibility, Construction Cost, Future Maintenance, and NEPA were established as the criteria for ranking the alternatives listed in Table 5, below. The matrix shown as Table 5 was created by ranking each of the alternatives from one to three, one representing the best alternative, and three representing the least attractive alternative for each criterion. Based on the lowest composite score and other factors Alternative 1, Levee Setback had the highest rank and was later determined to be the best alternative.

Table 5. Alternative Matrix used for selecting the preferred alternative.

	Levee Setback Alternative 1	River Realignment Alternative 2	Riprap Revetment Alternative 3
Rio Grande Silvery Minnow	1	2	3
Southwestern Willow Flycatcher	1	2	3
Lands Interest	2	1	2
Cultural Resources	2	1	3
Reliability	1	2	3
Feasibility	1	2	2
Construction Cost	3	1	2
Future Maintenance	1	2	3
NEPA	1	3	3
Total	**13**	**16**	**24**

Based on the ranking criteria, the preferred alternative was the Levee Setback. In this alternative there are no effects to existing riverine habitat, and habitat is expected to improve as the river migrates laterally. This alternative is favorable for endangered species based on these considerations. Levee Setback was only acceptable in this reach because Reclamation would not need to acquire any adjacent land. If Reclamation had to acquire land, the Levee Setback alternative would not be practical.

None of the alternatives were excluded or changed based on Cultural Resources. Each of the alternatives had varying requirements of environmental compliance and potential future maintenance. The channel realignment alternative had the highest maintenance cost.

In terms of the permitting process, the levee setback alternative was considered the easiest alternative to permit. Because this alternative did not disturb existing habitat for endangered species, environmental compliance would be easier allowing for timely completion of construction permits.

Levee setback was chosen as the preferred alternative for several reasons. This alternative had the lowest composite score in the alternative matrix. It won't require any maintenance for at least 40 years as opposed to the other alternatives that could require maintenance work in as little as five years. It is a long term fix. No construction would be required in the active channel of the Rio Grande or the adjacent riparian area which is advantageous for the endangered species, while at the same time allowing the permitting and compliance process to be smoother and less time consuming.

2.5 Other Planned Projects in the Area

LFCC Realignment – Phase Two

The second phase of the proposed action would only be carried out at some time in the future if the new LFCC alignment discharge capacity needs to be increased to 2,000 cfs from the currently planned discharge capacity of 500 cfs. This would involve raising the riprap lining along the side slopes of the channel to a height that would provide protection during a 2,000 cfs discharge and installing two additional 9.0 ft. diameter RCPs through the San Lorenzo Arroyo at the center of the new LFCC alignment.

The new LFCC alignment would be mowed to allow for the placement of additional riprap in the channel. Riprap would be placed on the side slopes from a 6.0 ft. depth (500 cfs design) to a 12.5 ft. depth (2,000 cfs design) for approximately 10,216 feet of channel. This would be followed by construction in the central segment to increase the discharge capacity across the San Lorenzo Arroyo.

Prior to construction in the central segment, the San Lorenzo Arroyo would be diverted around the south side of the construction area. To accomplish this, the culvert in the Lemitar Riverside Drain that passes under the San Lorenzo Arroyo would be extended an additional 80 ft. southward and covered with earthen fill material. A temporary channel and an earthen berm would be constructed to redirect flows in the arroyo away from the construction area.

Installation of the two RCPs would require dewatering to remove local groundwater for the construction of the RCP crossing as well as groundwater intercepted by the LFCC upstream of the RCP crossing. Dewatering would also be required for the construction of both the inlets and outlets. The groundwater would be discharged into the existing Lemitar Riverside Drain, LFCC, or a holding pond to allow the water to be used for construction activities. The holding pond's maximum size would be one acre with a depth of 5.0 ft. An overflow pipe would be installed in the pond to protect it from overfilling and damage.

After installation of the two RCPs, the San Lorenzo Arroyo channel flows would be redirected through the sheet pile drop structure. The added pipe and earth fill in the Lemitar Riverside Drain would be removed after construction is complete. All disturbed areas would be reseeded and monitored in a manner similar to the previously described revegetation plan for the proposed action. Table 6 below presents the estimated areas of disturbance and construction quantities for the second phase.

Table 6. Estimated Areas of Disturbance and Construction Quantities – Second Phase.

DESCRIPTION	QUANTITY	UNITS
Excavation: 9.0 ft. diameter RCP at San Lorenzo Arroyo.	25,500.0	cu. yds.
Diversion and Care of San Lorenzo Arroyo. Volume of earth to be moved	51,000.0	cu. yds.
New Riprap: 2,000 cfs channel:12.5 ft.	25,500.0	cu. yds.
Salvage riprap from inlet and outlet of the RCP crossing.	1,600.0	cu. yds.
Backfill: Reshaping of San Lorenzo Arroyo. 9.0 ft. diameter RCP at San Lorenzo Arroyo.	 29,850.0 24,750.0	 cu. yds. cu. yds.
Compacted Backfill: 9.0 ft. diameter RCP at San Lorenzo Arroyo.	24,750.0	cu. yds.
Reinforced Concrete (Inlets & Outlets) Inlet Outlet	 245.0 245.0	 cu. yds. cu. yds.
Road Base: O&M access roads. San Lorenzo Arroyo embankments.	 5,500.0 1,000.0	 cu. yds. cu. yds.

River Mile 111 Priority Site

Reclamation is also planning to address another priority site at RM 111 sometime after construction has begun at the RM 114 and 113 priority sites. Reclamation has identified the levee setback method as the preferred action to address the RM 111 priority site through a decision making process that drew upon the experience gained from the process described in the previous section of this EA. Realignment of the levee and LFCC at the RM 111 priority site would be very similar to the proposed action in this EA. The effects of such an activity would be expected to be very similar in nature to those described in Chapter 4 of this document.

2.6 Environmental Issues Addressed by the Proposed Action

The following issues correspond to the issues identified in Section 1.5. These issues are discussed in greater detail in Chapters 3 and 4 of this EA.

1) No Southwestern Willow Flycatchers were detected during surveys in 2004. Potential effects to other nesting birds would be addressed by performing clearing and grubbing operations in the winter months before nesting season begins. A monitoring plan for wintering Bald Eagles, as described in Chapter 4, would be implemented during construction. No Rio Grande Silvery Minnows were found in the LFCC near the project area during surveys. Fish barriers would be installed in the LFCC just outside the project limits to prevent Rio Grande Silvery Minnows from moving into the project area during construction. The LFCC would be resurveyed following installation of the fish barriers and prior to construction to document the absence of Rio Grande Silvery Minnows in the project area. These procedures would ensure that no effects to this species would occur.

2) The 286 cottonwood trees and 76 Goodding's willow trees removed at the beginning of construction would be replaced by pole plantings of 1,768 new cottonwoods and 448 Goodding's willows in selected areas near the river bank in the project area and in the habitat enhancement areas in the LFCC. These new trees would be spaced irregularly in the habitat enhancement areas and along the bank in openings to improve their potential for survival and to create a more natural condition. All pole plantings would be caged with chicken wire initially to prevent beaver damage.

3) Native grasses and shrubs would be seeded in areas disturbed by construction to reestablish vegetation. Only the amount of the proposed staging and stockpiling areas needed would be used or disturbed. Upon completion of stabilization activities, all work areas would be cleaned up and all materials and equipment removed. The area would be reseeded with native grasses and shrubs using the species presented in Section 2.3, above. The reestablishment of vegetation would be monitored by Reclamation and irrigation water would be brought in by truck, if necessary, to ensure the successful establishment of seeded areas.

4) The introduction of state-listed noxious weeds would be avoided to the extent possible by using equipment that has been thoroughly pressure washed prior to arrival at the project area. The reseeding activities would contribute to a more rapid establishment of native species, thus minimizing the opportunity for noxious weeds on disturbed ground. Most, if not all, of the riprap used for the project would be obtained from the existing LFCC.

5) Standard Best Management Practices (BMPs) would be used to manage water runoff during construction activities to prevent runoff during rainstorms from causing an unnaturally high level of sediment loading in the river. The contractor would utilize straw bails and silt fences placed at strategic locations to manage water runoff in the construction areas. One strategic location would be the entrance of the 60 in. diameter metal culvert located in the San Lorenzo Arroyo containment berm.

6) The generation of dust by earthmoving equipment would be minimized by spreading water onto disturbed areas daily to suppress the generation of dust.

7) Because the project is located in the original meandering path of the Rio Grande, any cultural or archaeological artifacts that might have once existed there have a very low probability of still being present. No sacred sites were identified by any native American tribes during tribal consultation by Reclamation.

8) None of the project area is located on any native American tribal land nor is any of the project area claimed by any tribes. No Indian Trust Assets were identified in the project area.

9) The project is not located in an area where it could have any effect on low-income or minority populations. The project is in compliance with Executive Order 12898.

2.7 Environmental Commitments

1) Clearing and grubbing activities would occur prior to the nesting season for migrant birds, including the Southwestern Willow Flycatcher.

2) Should a Bald Eagle be observed within 0.25 mi. upstream or downstream of the active project site in the morning before project construction activity starts, or following breaks in project construction activity, the construction crew would be required to suspend all activity until the bird

leaves on its own volition, or if the Reclamation biologist, in consultation with the Service, determines that the potential for harassment is minimal. However, if a Bald Eagle arrives during project construction activities or if a Bald Eagle is observed beyond the specified distance, construction would not need to be interrupted. If Bald Eagles are found consistently in the immediate project area during the construction period, Reclamation would contact the Service to determine whether formal consultation under the ESA is necessary.

3) Fish barriers would be installed in the LFCC just outside the project limits to prevent Rio Grande Silvery Minnows from moving into the project area during construction. The LFCC would be resurveyed following installation of the fish barriers and prior to construction to document the absence of silvery minnows in the project area.

4) The 286 cottonwood trees and 76 Goodding's willow trees removed at the beginning of construction would be replaced by pole plantings of 1,768 new cottonwoods and 448 Goodding's willows in selected areas near the riverbank and in the existing LFCC. These new trees would be spaced irregularly in the LFCC habitat enhancement areas and along the bank in openings to improve their potential for survival and to create a more natural condition. All pole plantings would be caged with chicken wire initially to prevent beaver damage.

5) Native grass and shrub seeds would be used to reestablish vegetation in areas disturbed by construction. Only the amount of the proposed staging and stockpiling areas needed would be used or disturbed. Upon completion of stabilization activities, the project area and the staging and stockpiling areas would be cleaned up and all materials and equipment removed. Disturbed areas would be reseeded with native grasses and shrubs using the species presented in Section 2.3, above. The reestablishment of vegetation would be monitored by Reclamation and irrigation water would be brought in by truck, if necessary, to ensure the successful establishment of the seeded areas.

6) To minimize the potential for the establishment of state-listed and other noxious weeds, an aggressive revegetation plan would be implemented. Reclamation would monitor the project area during construction (3-5 years) for noxious weeds and would treat them as necessary.

7) In addition to reseeding and planting, the introduction of noxious weed seeds would be minimized by a requirement that all equipment used on the project be pressure washed before arriving and leaving the site.

8) To minimize soil erosion and increased turbidity in the Rio Grande during rain storms, standard construction BMPs would be used to minimize runoff during construction.

9) Fugitive dust would be suppressed by spreading water over disturbed areas where heavy equipment is working during dry conditions.

10) Boulders would be placed between the adjacent landowner's property and the Lemitar Riverside Drain to prevent trespassing on the landowner's property after construction has been completed. Placement of the boulders would be carried out under the supervision of the adjacent landowner to ensure the landowner's satisfaction.