

Final Environmental Assessment

Project Name:

**Non-potable Water Reclamation and Reuse,
Northeast Heights and Southeast
Albuquerque**

Applicant:

**City of Albuquerque,
Public Works Department**

Location:

Bernalillo County, New Mexico

Lead Agency:

**U.S. Department of the Interior,
Bureau of Reclamation**

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EXECUTIVE SUMMARY

Project Purpose, Need, and Description

The City of Albuquerque (City) has relied exclusively on deep ground water for its water supply. However, recent studies show that the current City water supply cannot meet either current or future water demand without depleting the aquifer.

To address this shortfall, the City Council adopted the Albuquerque Water Resources Management Strategy (AWRMS) in 1997. The AWRMS involves minimizing the use of ground water, conserving and optimizing the use of the City's existing water resources, and developing alternative water supplies to provide a safe, sustainable, and dependable water supply for the City.

- This environmental assessment (EA) assesses the combined effects of implementing two proposed Non-potable Water Reclamation and Reuse projects in the Northeast Heights and in the Southeast area of Albuquerque. These projects would use non-potable surface water and polished municipal wastewater effluent to replace the use of high-quality, deep-aquifer ground water for turf irrigation and industrial purposes: Non-potable Surface Water Reclamation Project would provide approximately 3,038 acre-feet of water per year to irrigate about 900 acres of parks, golf courses, and greenbelts in the Northeast Heights area. The sources of this reuse water are a portion of the City's imported San Juan-Chama water, reclaimed industrial wastewater, and continued use of a portion of the City's native Rio Grande water rights.
- Southside Water Reclamation Plant Reuse Project would provide 2,455 acre-feet of water per year to irrigate about 700 acres of parks, golf courses, and greenbelts in an area north and east of the Southside Water Reclamation Plant. This project would also provide 93 ac-ft/yr. for industrial purposes. This entire volume of water would consist of treated wastewater effluent.

Although the projects are independent components of the AWRMS, they are being addressed jointly throughout the NEPA process for a more complete analysis. The two projects comprise the proposed actions. These two projects represent the second and third steps of the AWRMS and complement the North I-25 Industrial Recycling Project, which is currently under construction.

The Bureau of Reclamation is serving as the lead federal agency. The federal reclamation action associated with the proposed action (the two reclamation/reuse projects) consists of two elements. One element would involve providing federal funds to the project. The second element would involve federal concurrence authorizing the City's license agreement to construct surface water diversion facilities within the Rio Grande floodplain. There are other, related federal requirements related to the projects and the NEPA analysis (e.g., 404 Permit).

The area covered by this EA includes the river corridor that extends from Abiquiu Dam on the Rio Chama north of Albuquerque to below the Isleta Diversion on the Rio Grande south of Albuquerque. In addition, this EA examines the effects of project implementation on the two areas that would receive non-potable water from this project, both of which are within the City of Albuquerque.

The alternatives evaluated in this EA include the Proposed Action and the No Action alternative. Other alternatives were evaluated and screened out during project planning and development feasibility studies.

Scoping

Two public scoping meetings were held in Albuquerque in July 1999 to identify issues of concern to the public. Agency concerns were identified through consultations and monthly interagency work groups. These activities identified 15 resource areas of concern for the Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque. All 15 areas, as well as cumulative effects, are evaluated in this EA.

Summary of Effects

The EA first defined the existing environment for the project vicinity for each resource area of concern that was identified in scoping. The effects of the Proposed Action and the No Action alternatives were then identified.

For all resource areas, the Proposed Action that was evaluated included environmental design features and best management practices that are intended to protect environmental aspects of the project area, and mitigation measures that are intended to eliminate or minimize potentially adverse changes to environmental resources. The City will incorporate these elements into the project design.

Both beneficial and adverse effects were identified from the implementation of the Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque. A brief summary of the effects to each resource area is provided below. With its incorporation of environmental design features, best management practices, and mitigation measures, the Proposed Action will not have any substantial effects on any of the resource areas of concern.

Water. Water resources addressed surface water, ground water, water supply, and water quality. The City will take delivery of 2.4 cubic feet per second (1,700 acre-feet per year) of its San Juan-Chama allotment. This would slightly increase flows in the Rio

Chama and the Rio Grande from Abiquiu Dam downstream to the surface water diversion facility just south of the Alameda Bridge crossing in Albuquerque. A portion of the water used for industrial purposes would be returned at the Southside Water Reclamation Plant for a net decrease in the Rio Grande of 1,434 acre-feet per year. This represents a decrease of approximately 0.17 percent of existing mean monthly flow (mean flow of 1,202 cfs in the river). The greatest decrease would be about 0.6 percent and would occur during September, when the flow in the river is 439 cfs. This decrease is not expected to adversely affect endangered species, water quality, irrigation water supply, or wetland and riparian resources.

Using the surface water for turf irrigation would eliminate withdrawal of 5,493 acre-feet of ground water per year from the deep aquifer approximately half of which is not replenished. Reducing this withdrawal would be considered a beneficial effect of the Proposed Action.

Biological Resources. This resource area addresses fish and wildlife, wetlands, riparian areas, and threatened and endangered species. Direct effects of project construction and operation would result in the permanent removal of up to 1.0 acres of riparian woodlands and the temporary alteration of 5 to 8 acres of riparian woodlands located around the surface water diversion facility on the Rio Grande. No substantial effects are anticipated to fish or wildlife because of the small magnitudes of change associated with this project. There would likely be some displacement and dispersal of small wildlife during the construction phase in the bosque. Jurisdictional wetlands would not be affected because none occur in the project area.

No adverse effects are anticipated to the endangered Southwestern willow flycatcher from either direct or indirect project effects. No flycatcher habitat has been located in the project area. If any bald eagles were to be encountered during construction, activities would be halted until the eagle left the construction area. There would be no substantive effects to aquatic habitat depth or velocity from the projects, so there are no substantive effects to the Rio Grande silvery minnow. There would be a depletion below the Southside wastewater Reclamation Plant of an average of 0.17 percent of river flow. This depletion, while an effect to the river, is essentially undetectable. The City and the United States Fish and Wildlife Service (USFWS) have negotiated a mutually agreeable compensation program for these effects. Operations of the reservoirs upstream of Albuquerque would not be modified to deliver the City San Juan – Chama water, so the fisheries, shoreline habitats or associated wetlands would not change. In-river construction will be coordinated with USFWS and fish salvage operations will be undertaken as needed.

Aesthetics/Visual Resources. The Proposed Action would result in the placement of a new pump station for the surface water diversion facility in an undeveloped portion of riparian corridor located downstream of the Alameda Bridge. This structure would represent a visual intrusion to the existing natural setting. However, other residential and commercial structures are already visible from the same location. All other project facilities would be located in existing developed areas and would have little effect on the visual or aesthetic resource. All facilities would be designed and landscaped to reduce their visibility.

Traffic and Circulation. Project construction would involve installing pipelines along a total of approximately 81,300 linear feet of two-lane city streets and about 95,500 linear feet of 4-lane streets, and would cross about 125 intersections. Construction contractors would be required to comply with City ordinances that are intended to minimize traffic congestion and delays in urban areas and in or near the bosque. Temporary delays in traffic flow would be anticipated in construction zones.

Soils and Vegetation. Approximately 1,610 acres of park, golf course, and open space turf would be irrigated with non-potable water from the Proposed Action. Use of proven water management techniques would ensure that buildup of salts did not occur in the soil, which could affect the health and vigor of the turf. Total residual chlorine concentrations in the non-potable water would be identical to those occurring in potable water that currently is used for irrigation and would not be toxic to irrigated vegetation.

Cultural Resources. The Proposed Action would not affect any known, registered historical or archaeological sites, or sites proposed for listing on the National Register of Historic Places. A cultural resources discovery plan would be approved by Reclamation and the State Historic Preservation Office (SHPO) to address any resources that were unexpectedly encountered during construction.

Socioeconomic Factors. The Proposed Action would cost about \$35.1 million, which would include \$23.1 million for the Non-potable Surface Water Reclamation Project and \$12.0 million for the Southside Water Reclamation Plant Reuse Project. Twenty-five percent of this cost is eligible for reimbursement through Reclamation Title XVI grant funds. Construction would take place in phases.

The Proposed Action would be expected to generate a maximum of 250 new temporary construction jobs, create an average of about 100 new construction jobs over a 2-year period, and create 6 to 10 new permanent jobs for project operations and maintenance. The Proposed Action would result in a water rate increase of about \$2.14 per month per household.

Noise and Vibration. Project construction would involve new construction in roadways, six new pump stations, and three new reservoirs. Noise from construction equipment would occur during daylight hours. Construction contractors would be required to comply with City ordinances that are intended to minimize noise effects from construction equipment. Pumps that are part of the water conveyance system would be operated so that they would not exceed City noise standards.

Human Health and Safety. The trace levels of fecal coliforms in the plant effluent would exceed the U.S. Environmental Protection Agency unrestricted urban reuse guidelines for effluent quality. Therefore, chlorine would be used to disinfect the effluent prior to its use for turf irrigation.

Air Quality. Implementing the environmental design features of the Proposed Action as required by the City for construction projects would ensure that the project would not create any temporary, long-term, or cumulative adverse effects to air quality. Albuquerque is an attainment area for air pollutants regulated under the Clean Air Act.

Environmental Justice. The Proposed Action is not anticipated to create any disproportionately high or adverse effects to human health or environmental conditions of minority or low-income groups. The pipeline routes, storage reservoir locations, and pump station sites would be located throughout the areas frequented by many ethnic and economic groups.

Land Use. The Proposed Action may require a small purchase of private land near Oso Grande Park. The project would not affect any prime or unique farmlands.

Recreation. The Proposed Action would not cause the gain, loss, or substantial degradation of any existing recreational use in the project area. Some temporary disruption of trail use and open space character may be associated with construction of the subsurface water diversion facility and associated pump station.

Floodplains Approximately 0.5 acres of floodplain would be converted to uplands to accommodate the pump station and access road for the subsurface water diversion facility. This alteration would not adversely affect the flood-carrying capacity of the 100-year floodplain.

Indian Trust Assets, Cultural Resources, and Tribal Health and Safety Reclamation recognizes its legal obligations to identify, protect, and conserve the trust resources of federally recognized Indian tribes and tribal members and to consult with Pueblos and tribes on a government-to-government basis for plans or actions that could affect tribal trust resources, trust assets, or tribal health and safety. Requests for government-to-government consultation has resulted in the identification of some resources of concern. To date, resources of concern include surface water flows, surface water quality, riparian areas, and traditional cultural properties.

Effects from the Proposed Action would include the following.

- The Proposed Action would slightly increase river flow (by about 2.4 cfs) through the Pueblos between Abiquiu dam and the diversion point just south of the Alameda Bridge crossing in Albuquerque. This quantity of water represents less than 0.5 percent of mean monthly flow measured at Cochiti. The relatively small increase in water volume as the Rio Grande travels through Pueblos would not affect water supply for traditional uses, water quality, or the stability or maintenance of riparian ecosystems. The timing of water release would be the same as the historic pattern of water releases, and the water volume and hydrologic changes would be difficult to differentiate from background variations.
- The Proposed Action would result in a river flow depletion averaging 0.17 percent (about 2.0 cfs) of existing mean monthly flow below the wastewater treatment plant outfall. At Isleta Diversion Dam, additional river water is diverted by other users, and the size of the small depletion is further reduced as river flow proceeds downstream. The magnitude of the depletion would not affect water quality, aquatic habitat, or other uses of the water.

- The Proposed Action has not been found to cause any effects to Indian Trust resources, assets, or tribal health and safety from construction or other types of direct site alterations or operations of the projects.

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LIST OF ACRONYMS AND ABBREVIATIONS

ac-ft	acre-foot (feet)
ac-ft/mo	acre-foot (feet) per month
ac-ft/yr.	acre-foot (feet) per year
ACC	Albuquerque City Code
AD	<i>anno domini</i>
AWRMS	Albuquerque Water Resources Management Strategy
AWRSI	Albuquerque Water Resources Strategy Implementation
BMP	best management practice
cfs	cubic foot (feet) per second
City	City of Albuquerque
Corps	U.S. Army Corps of Engineers
dB (A)	decibel (s)
EA	environmental assessment
EC	electrical conductivity
EDF	environmental design feature
EIS	environmental impact statement
ELUC	Open Space, Environmental Land Use Committee
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FONSI	finding of no significant impact
ft	foot (feet)
gpm	gallon (s) per minute
GPPAP	Ground Water Protection Policy and Action Plan
GWDP	ground water discharge plan
I-25	U.S. Interstate 25
LA	Laboratory of Anthropology, New Mexico Historic Preservation Division
LF	linear foot (feet)
MRGCD	Middle Rio Grande Conservancy District
MG	million gallon(s)
mgd	million gallon(s) per day
mg/L	milligrams per liter
MM	mitigation measure
mmhos/cm	millimhos per centimeter
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act

NHPA	National Historic Preservation Act
NMAC	New Mexico Administrative Code
NPDES	National Pollutant Discharge Elimination System
NMED	New Mexico Environment Department
O&M	operations and maintenance
PNM	Public Service Company of New Mexico
ppm	part per million
PVC	polyvinyl chloride
Reclamation	Bureau of Reclamation
RGSM	Rio Grande silvery minnow
RM	river mile
ROW	right-of-way
SAR	sodium adsorption ratio
SHPO	New Mexico State Historic Preservation Office(r)
SWRP	Southside Water Reclamation Plant
TDS	total dissolved solids
TRC	total residual chlorine
UNM	University of New Mexico
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UUR	unrestricted urban reuse

SECTION 1

PURPOSE AND NEED

The City of Albuquerque, New Mexico (City) and the Bureau of Reclamation (Reclamation) propose to implement Non-potable Water Reclamation and Reuse, in the Northeast Heights and Southeast of Albuquerque. This proposal would consist of a non-potable surface water reclamation project in the Northeast Heights area and a wastewater effluent reuse project in the southeast portion of the City. The proposal would use non-potable surface water from the Rio Grande and polished municipal wastewater effluent from the City's Southside Water Reclamation Plant to replace the use of high-quality, deep-aquifer ground water for irrigation and industrial purposes.

This environmental assessment (EA) addresses the potential effects of implementing Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque. This section presents the purpose of and need for the action, identifies the proposal, and the federal reclamation action required to implement the proposal.

1.1 BACKGROUND

Historically, the City and other water users in Bernalillo County have relied exclusively on a deep ground water source, the Santa Fe Group aquifer system, for their water supply. This resource is part of a regional aquifer called the Albuquerque underground water basin.

Aquifer studies conducted during the 1950s and 1960s indicated that the aquifer was very large and deep, and that recharge from the Rio Grande would allow extensive withdrawals without affecting the aquifer's long-term ability to supply water. However, more recent studies by the U.S. Geological Survey (USGS) (1995), Reclamation (1997b), and New Mexico Bureau of Mines and Mineral Resources (1992) demonstrated that the City's primary water supply aquifer is being depleted at a rate twice that of its recharge rate from the Rio Grande.

In 1997, the City Council adopted the Albuquerque Water Resources Management Strategy (AWRMS) (CH2M Hill, 1997a and 1997b). The AWRMS is based on:

- Minimizing the continued pumping of and reliance on ground water resources.
- Conserving and optimizing the use of the City's existing water resources.
- Developing alternative water supplies, including the City's San Juan-Chama (SJ-C) water, to provide a safe, sustainable, and dependable water supply for the City.

The AWRMS includes using reclaimed surface water from the Rio Grande, reclaimed industrial effluent, treated municipal effluent, and other low-quality water sources for irrigation of large turf areas and for industrial purposes that are able to use lower-water quality. The non-potable water would replace the use of potable-quality water supplied either by the City or by private wells.

The City of Albuquerque proposes to implement two non-potable water reclamation and reuse projects, one located in the Northeast heights and one located in southeast Albuquerque. The locations of these two components are provided in Figure 1.

The Non-potable Surface Water Reclamation Project would use a portion of the City's share of San Juan-Chama surface water. The reclaimed surface water would be diverted from the Rio Grande using a new subsurface water diversion facility that would be located partially beneath the river channel and partially on the east side of the river. The non-potable surface water would be blended with industrial effluent from an existing system in the North I-25 (U.S. Interstate 25) area. The blended water would be pumped to storage reservoirs and distributed to turf irrigation and industrial water users by subsurface conveyance pipelines.

The source of water for the Southside Water Reclamation Plant Reuse Project would be treated municipal effluent from the Southside Water Reclamation Plant. The water would be pumped from the plant to a storage reservoir. It would then be distributed to turf irrigation and industrial users by a separate system of subsurface conveyance pipelines.

Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque would complement a previous portion of the City's program to beneficially use reclaimed and recycled water. The North I-25 Industrial Recycling Project is currently under construction. Details of that project and related environmental documentation are provided in Reclamation (1999).

The North I-25 Industrial Recycling Project will provide recycled water to industrial and turf irrigation users in the northeast area of Albuquerque. Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque would provide additional reclaimed water to an increased number of users for turf irrigation, and to one industrial user. Together, these projects would support the City of Albuquerque's Water Resources Strategy Implementation (AWRSI) of optimizing existing water resources and developing new water supplies.

The Non-potable Surface Water Reclamation Project would blend reclaimed surface water from the Rio Grande with industrial wastewater and deliver it to local users. This portion of the Proposed Action would use some of the City's allotment of San Juan-Chama surface water as the primary supply. The reclaimed surface water would be blended with reclaimed industrial wastewater provided as part of the North I-25 Industrial Recycling Project (CH2M Hill, 1999a). The blended water would be used in the North I-25 project service area for irrigating large turf areas and for industrial uses. The details and feasibility for this portion of the Proposed Action are described in the *Non-potable Surface Water Reclamation Project Feasibility Study* (CH2M Hill, 1999b).

An additional source of non-potable water for turf irrigation and industrial cooling use would be the effluent from the City's Southside Water Reclamation Plant. This effluent currently is treated to federal and state water quality standards and discharged to the Rio Grande. The wastewater effluent would be further treated onsite to meet U.S. Environmental Protection Agency (EPA) (1992) standards for unrestricted urban reuse (UUR), and then made available to water customers in the southeastern portion of the City. The details and feasibility for this portion of the Proposed Action are described in the *Southside Water Reclamation Plant Reuse Project Feasibility Study Draft Report* (CH2M Hill, 1999c).

1.2 PURPOSE OF THE PROPOSED PROJECT

The purpose of Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque is to continue developing City-owned, reclaimed, non-potable water collection, storage, disinfection, and distribution systems for industrial purposes and for irrigation of turf areas. This activity is in accordance with the objectives of the AWRMS. The project would replace the current and future use of approximately 5,493 acre-feet per year (ac-ft/yr.) of ground water currently being obtained from the Santa Fe Group aquifer system. The purpose of using reclaimed water for non-potable purposes is to replace the use of an equivalent net amount of ground water that is pumped from the aquifer.

1.3 NEED FOR PROJECT

The current City water supply cannot meet either current or future water demand without depleting the aquifer. Without changes in water management, it is estimated that the City will have a shortage of potable water of more than 100,000 ac-ft/yr. in the year 2060 (CH2M Hill, 1997c).

Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque is needed as a component of the AWRMS to reduce aquifer withdrawals and to help ensure a safe, sustainable, dependable public water supply for the City. The Proposed Action is needed to replace the withdrawal of 5,493 ac-ft/yr. of potable-quality ground water from the aquifer. This represents approximately 5.5 percent of the City's projected deficit for the year 2060.

Figure 1 Project Location

The Proposed Action must also be considered as part of a cumulative action that includes the already-permitted North I-25 Industrial Recycling Project, which will have an annual yield of 896 acre-feet. Together, these projects will replace the demand for 6,389 ac-ft/yr. of potable water with a non-potable water supply.

1.4 FEDERAL ACTION REQUIRED

The proposed federal action would involve two elements. One element would involve providing federal funds to support feasibility studies and planning, engineering, design, environmental compliance, and construction of the Proposed Action. The second element would involve federal concurrence authorizing the City's license agreement with the Middle Rio Grande Conservancy District (MRGCD) to construct the proposed diversion facilities within the floodplain.

Public Law 102-575, Title XVI, Section 1621, as amended by Public Law 104-266, and Public Law 105-62, Section 506 authorizes Reclamation to provide cost sharing for water reclamation and reuse projects. Reclamation has received an appropriation of \$4,650,000 for implementation of several water reclamation and reuse projects as identified in the AWRMS. Reclamation would provide financial contribution, subject to appropriations by Congress, not to exceed 25 percent of the total project costs to support feasibility studies and planning, engineering, design, environmental compliance, and construction of the Proposed Action.

The City would be required to contribute at least 75 percent of the project cost. These funds may be obtained from any non-federal source.

The estimated total cost of Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque is \$35.1 million. Special conditions or obligations associated with the funds include:

- The demonstration of financial capability to finance the non-federal share;
- Department of the Interior approval of the cost-share agreement;
- Preparation of a feasibility study that addresses the requirements of Title XVI; and
- Compliance with the requirements of the National Environmental Policy Act (NEPA).

This EA discloses the potential effects if federal funds and licensing concurrence are used to develop the Proposed Action, and the implications of those effects to the human and natural environments. Reclamation will take this action after compliance with NEPA requirements has been demonstrated and the City has completed all other required procedures and applications. Permits required for project implementation are identified in Appendix A.

SECTION 2

ALTERNATIVES

This section describes the alternatives considered. Two alternatives, No Action and Proposed Action are analyzed in detail. This includes:

- A summary of environmental effects of implementing the Proposed Action or the No Action alternative.
- A description of how the project alternatives were developed.
- Descriptions of the alternatives that were eliminated by screening from further consideration.
- A description of alternatives, including Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque (the Proposed Action) and the No Action alternative.

2.1 SUMMARY OF EFFECTS AND EVALUATION OF ALTERNATIVES

Table 2.1-1 summarizes the quantitative environmental effects of the Proposed Action and the No Action alternative. Details of the environmental effects analyses that are summarized in this table are presented in Section 3.

- The alternative responsible for the greatest adverse effect in each evaluation criterion is marked with a double asterisk (**).
- The alternative that would cause the smallest adverse effect for each evaluation criterion is marked with a single asterisk (*).
- No designation is given if the effects of the alternatives are identical.
- A zero value indicates that the alternative would not produce any adverse or beneficial effect to that criterion.
- A negative loss is the same effect as a gain. This convention was used to allow an equivalent comparison with the other evaluation criteria that track adverse changes. The larger the negative number, the greater the benefit or gain.

A relative ranking of the alternatives, based on the total occurrences and percentages of “least adverse change” and “greatest adverse change” designations for each criterion

for each alternative, is presented at the end of Table 2.1-1. This ranking represents the results of the environmental evaluation only. As shown in the table:

- Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque would cause the *greatest* adverse change for 30 (34 percent) of the 88 criteria.
- Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque would cause the *least* adverse change for 2 (2 percent) of the 88 criteria.
- The two projects would have similar effects for 53 (60 percent) of the 88 criteria.
- The two projects would have beneficial effects for 4 (4 percent) of the 88 criteria.

Based on the results of this analysis, the No Action alternative would be responsible for the fewest number of undesirable environmental changes. Therefore, it would be considered the environmentally-preferred alternative. However, the No Action alternative fails to meet the project purpose and need to develop a non-potable water supply to meet non-drinking water demands and reduce aquifer pumping.

**TABLE 2.1-1
SUMMARY OF ENVIRONMENTAL EVALUATION CRITERIA AND
COMPARISON OF ALTERNATIVES**

Evaluation Criteria	Alternative	
	Proposed Action	No Action
Water		
1. Maximum percent net reduction of flow in the Rio Grande during monthly low flow period as a result of using reclaimed wastewater for turf irrigation and other uses.	0.6 ^{*/**b/}	0 ^{*c/}
2. Percent net reduction in annual average volume from the City's wastewater treatment plant discharged to the Rio Grande (acre-feet per year).	3.8 ^{**}	0 [*]
3. Total net quantity of ground water permanently removed from ground water aquifer for non-potable use (acre-feet per year).	0 [*]	5,493 ^{**}
4. Number of existing surface water and ground water uses that would be impaired by using reclaimed water.	0	0
5. Number of water quality parameters exceeding State ground water concentration standards.	0	0
6. Percent reduction in riverside drain flow affected by project operation.	7 ^{**}	0 [*]
7. Number of water rights holders in the Middle Rio Grande whose access to water or water use activities are restricted by project construction and operation.	0	0
8. Total quantity of wastewater requiring treatment at City wastewater treatment facility (acre-feet per year).	2,455 [*]	2,525 ^{**}
9. Percent reduction in overbank flooding potential.	0	0
Biological Resources		
1. Total number of federal-listed species that are potentially affected.	2 ^{**}	0 [*]
2. Total number of federal-listed species that are adversely affected.	0	0
3. Total number of State-listed species that are potentially affected.	1 ^{**}	0 [*]
4. Total number of State-listed species that are adversely affected.	0	0
5. Total number of designated critical habitat areas that are adversely affected.	0	0
6. Total acres of designated critical habitat degraded or lost.	0	0
7. Total volume (acre-feet year) of downstream flow depletion that may affect designated critical habitat for Rio Grande silvery minnow.	1,434 ^{**}	0 [*]
8. Reduction in Rio Grande water depth (feet) in the Albuquerque reach after project is implemented, at severe monthly low flow of 200 cfs.	0.02 ^{**}	0 [*]
9. Total acres of potential Southwestern willow flycatcher habitat permanently lost as a result of project construction or operation.	1	0
10. Total number of wetland areas adversely affected by construction.	0	0

Evaluation Criteria	Alternative	
	Proposed Action	No Action
11. Number of known raptor nest sites lost because of construction.	0	0
12. Number of known bald eagle nest sites lost or disturbed because of construction.	0	0
13. Acres of potential bald eagle forage area lost or disturbed because of construction, during in-river, temporary.	8	0
14. Number of acres of wildlife habitat permanently lost to construction.	1**	0*
15. Acres of jurisdictional herbaceous wetlands that would be lost due to ground water elevation drawdown of 1.5 feet or more below the existing average ground water depth for a period of at least one month during the growing season.	0	0
16. Acres of jurisdictional herbaceous wetlands that would experience substantial changes in overall community plant structural composition resulting from a ground water decline of 1 foot or more for at least one month due to ground water elevation drawdown.	0	0
17. Acres of jurisdictional woody wetlands that would be lost due to ground water elevation drawdown of 3 feet or more below the existing average ground water depth for a period of at least one month during the growing season.	0	0
18. Acres of jurisdictional woody wetlands that would experience substantial changes in overall plant structural composition resulting from a ground water elevation drawdown of 1–3 feet for at least one month due to ground water elevation drawdown.	0	0
19. Acres of non-jurisdictional herbaceous wetlands that would be lost due to ground water elevation drawdown of 1.5 feet or more below the existing average ground water depth for at least one month during the growing season.	0	0
20. Acres of non-jurisdictional herbaceous wetlands that would experience substantial changes in overall plant structural composition resulting from a ground water elevation drawdown of 1 foot or more below the existing average ground water depth for at least one month during the growing season.	0	0
21. Acres of riparian areas that would be lost due to ground water elevation drawdown of more than 3 feet below the existing average ground water depth for at least one month during the growing season.	0.4**	0*
22. Acres of riparian areas that would experience substantial changes in overall community plant structural composition resulting from a ground water decline of 1 to 3 feet for at least one month.	7.2**	0*
23. Number of jurisdictional herbaceous wetlands that would be lost due to ground water elevation drawdown of 1.5 feet or more below the existing average ground water depth for a period of at least one month during the	0	0

Evaluation Criteria	Alternative	
	Proposed Action	No Action
growing season.		
24. Number of jurisdictional herbaceous wetlands that would experience substantial changes in overall community plant structural composition resulting from a ground water decline of 1 foot or more for at least one month due to ground water elevation drawdown.	0	0
25. Number of jurisdictional woody wetlands that would be lost due to ground water elevation drawdown of 3 feet or more below the existing average ground water depth for a period of at least one month during the growing season.	0	0
26. Number of jurisdictional woody wetlands that would experience substantial changes in overall plant structural composition resulting from a ground water elevation drawdown of 1 to 3 feet for at least one month due to ground water elevation drawdown.	0	0
27. Number of non-jurisdictional herbaceous wetlands that would be lost due to ground water elevation drawdown of 1.5 feet or more below the existing average ground water depth for at least one month during the growing season.	0	0
28. Number of non-jurisdictional herbaceous wetlands that would experience substantial changes in overall plant structural composition resulting from a ground water elevation drawdown of 1 foot or more below the existing average ground water depth for at least one month during the growing season.	0	0
29. Number of riparian areas that would be lost due to ground water elevation drawdown of more than 3 feet below the existing average ground water depth for at least one month during the growing season.	1**	0*
30. Number of riparian areas that would experience substantial changes in overall community plant structural composition resulting from a ground water decline of 1 to 3 feet for at least one month.	1**	0*
Aesthetics and Visual Resources		
1. Approximate number of households within 0.25-mile radius of a reservoir that would have an unobstructed view of a new structure.	50**	0*
2. Number of public use areas (parks) within 0.25-mile that would provide an unobstructed view of a new structure.	3**	0*
3. Approximate percent of tank perimeter within 10 feet of ground's surface that would not be screened by vegetation or barrier treatments.	0	0
4. Approximate percent of tank perimeter within 10 feet of ground's surface that would allow unrestricted access and potential for vandalism.	0	0
5. Number of facilities that would be located in a sensitive viewshed or viewing area.	0	0

Evaluation Criteria	Alternative	
	Proposed Action	No Action
6. Number of facilities that would be visually dominant to the average viewer.	1**	0*
7. Number of facilities that would have visual aspects that would consistently draw the eye from the surroundings.	1**	0*
Traffic and Circulation		
1. Number of intersection crossings (constructed or bored).	125**	0*
2. Length of pipeline to be installed in 2-lane streets (linear feet).	81,322**	0*
3. Length of pipeline to be installed in 4-lane streets (linear feet).	95,466**	0*
4. Number of street segments where anticipated traffic delays would exceed City requirements.	0	0
Soils and Vegetation (Vegetation in Turf Areas)		
1. Number of average water quality parameters that exceed EPA water quality standards for irrigation water use.	1 (fluoride)**	0*
2. Water quality parameters in irrigation water that would have an adverse effect on plant growth.	0	0
3. Acres of land that would not be suitable for irrigation.	0	0
4. Number of plant species that would experience toxic effects resulting from irrigation with the reclaimed water.	0	0
Cultural Resources		
1. Total length of undisturbed ground surface with the potential for subsurface cultural resources that could be disturbed by construction (linear feet).	24,190**	0*
2. Number of potentially-eligible cultural resources sites or traditional cultural properties likely to be affected by project construction and operation..	0	0
3. Total length of distribution system that would be disturbed by construction (linear feet).	200,978	0
Socioeconomic Factors		
1. Cost of additional rate increase to fund this specific project (dollars per month per household).	\$2.14	\$2.14
2. Number of businesses or commercial operations along the pipeline route that would require relocation or closing.	0	0
3. Total number of permanent new jobs lost because of the project ^{a/} .	-10	0
4. Total number of temporary or seasonal new jobs lost because of the project ^{a/} .	-250	0
5. Average number of construction jobs lost during the period of	-100	0

Evaluation Criteria	Alternative	
	Proposed Action	No Action
construction ^{a/} .		
6. Amount of rate increase as a percentage of the average monthly household income for County residents.	<0.1**	0*
7. Amount of rate increase as a percentage of the average 1998 monthly water bill for County residents	<0.1**	0*
Noise and Vibration		
1. Length of pipeline to be installed in streets within 500 feet of residences (linear feet).	61,135**	0*
2. Number of expected cases when construction activities would exceed City vibration standards.	0	0
3. Number of expected cases when operation activities would exceed City vibration standards.	0	0
4. Number of expected cases when construction activities would exceed City noise standards.	0	0
5. Number of expected cases when operation activities would exceed City noise standards.	0	0
Human Health and Safety		
1. Number of cross-connections likely to be implemented during construction activities.	0	0
2. Number of reclaimed water quality parameters that would exceed primary drinking water quality standards.	0	0
3. Number of reclaimed water quality parameters that would exceed unrestricted urban use EPA guidelines for effluent quality.	2**	0*
Indian Trust Assets, Cultural Resources and Tribal Health and Safety		
1. Number of trust assets potentially adversely affected by project construction and operation ^{a/} .	-2	0
2. Number of tribal individuals potentially exposed to unhealthful or unsafe conditions by project construction and operation.	0	0
3. Number of listed and identified cultural resources or traditional cultural properties likely to be affected by project construction and operation.	0	0
4. Isleta Pueblo water quality standards likely to be exceeded by project operations	0	0
Air Quality		
1. Number of federal air quality parameters likely to be exceeded by construction activities.	0	0
2. Number of state air quality parameters likely to be exceeded by construction activities.	0	0

Evaluation Criteria	Alternative	
	Proposed Action	No Action
3. Number of air quality parameters that would likely exceed non-attainment thresholds.	0	0
4. Total length of unpaved route that will be disturbed by construction (linear feet).	24,190**	0*
Environmental Justice		
1. Number of identified minority or low-income communities disproportionately affected by project implementation.	0	0
Recreation		
1. Total length of hike or bike trail temporarily affected by pipeline or facility construction (linear feet).	250**	0*
2. Number of playing fields to which access or uses are affected by project construction.	0	0
Land Use		
1. Number of areas that require a change in existing land use(s) or zoning.	0	0
2. Number of acres that require a change in existing land use(s) or zoning.	0	0
3. Total acres of prime or unique farmland adversely affected.	0	0
Floodplains		
1. Total acres of existing floodplain permanently removed from flood carrying capacity.	0.5**	0
Total Least Change (number of designations)	2	30
Total Most Change (number of designations)	30	2
Relative Rank (1 = preferred) ^{d/}	2	1

- a/ A negative loss is the same effect as a gain. This convention was used to allow an equivalent comparison with other evaluation criteria that track adverse changes. The larger the negative number, the greater the benefit or gain
- b/ alternative responsible for least change for the evaluation criteria
- c/ alternative responsible for most change for the evaluation criteria
- d/ ranking based on environmental evaluation only; see text

2.2 DEVELOPMENT OF PROJECT ALTERNATIVES

The AWRSI relies on a conjunctive use management approach as the basis for reducing demand on the ground water aquifer, providing a sustainable water supply, and preserving the ground water aquifer as a drought reserve. The two water supplies comprising the Proposed Action are the next steps needed to implement the AWRSI.

The North I-25 Industrial Recycling Project (CH2M Hill, 1999a) established a small reclaimed water project that used recycled industrial wastewater as a water source for local turf irrigation and industrial uses. The Proposed Action would build on that initial project to serve additional non-potable uses. The incremental effect of reducing ground

water withdrawals by using reclaimed water as a source is considered a beneficial effect to future water supply sustainability.

Feasibility studies were completed for the Non-potable Surface Water Reclamation Project and the Southside Water Reclamation Plant Reuse Project using Reclamation's (1998) guidelines for feasibility studies of reclaimed water systems. The feasibility studies identified potential sources of reclaimed water, identified potential customers that could use the reclaimed water, and provided cost estimates to construct, operate, and maintain the reclaimed water systems (CH2M Hill, 1999b and 1999c).

The Non-potable Surface Water Reclamation Project feasibility study identified two possible water distribution system alternatives. These two possible distribution systems, described in Table 2.2-1 as N-A and N-B, were initially evaluated using monetary and non-monetary factors (CH2M Hill, 1999b).

As shown in the table, the two Non-potable Surface Water Reclamation Project alternatives were very similar. The number of reservoirs and pump stations, and the subsurface water diversion facility would be the same for both alternatives. Alternative N-A and Alternative N-B differed in the routing of the distribution system pipelines to serve the same number of identified customers. They also varied in the locations of reservoirs and pump stations.

**TABLE 2.2-1
NON-POTABLE SURFACE WATER RECLAMATION PROJECT
ALTERNATIVES**

Alternative	Features
N-A	<p>Would serve 28 potential users. A new subsurface water diversion facility and pump station would be located adjacent to the Rio Grande, south of Alameda Boulevard.</p> <ul style="list-style-type: none">• The first distribution main would extend from the Rio Grande diversion and pump station along Alameda Boulevard and Washington Street to the Honeywell site.• The second main would extend from a new pump station at the Coronado site along Louisiana Boulevard, Burlison Drive, Truchas Drive, and across Arroyo del Oso Golf Course to a new pump station and reservoir to be located adjacent to the Arroyo del Oso Golf Course, west of Wyoming Boulevard.• The third main would extend from the new pump station and reservoir located adjacent to Arroyo del Oso along Bear Canyon Arroyo to a new pump station and reservoir east of El Oso Grande Park and west of Juan Tabo Boulevard.• The fourth main would extend from the new pump station and reservoir near El Oso Grande Park, along Juan Tabo Boulevard, Camero Avenue, Carruthers Street, Academy Road, and Tanoan East Drive.• The fifth main would extend from Bear Canyon Arroyo along Moon Street, Academy Road, Pino Arroyo, Ventura Street, San Francisco Road, Barstow Street, Wilshire Avenue, and South Domingo Baca Arroyo.
N-B	<p>Would serve 28 potential users. A new subsurface water diversion facility and pump station would be at the same location as Alternative N-A.</p> <ul style="list-style-type: none">• The first distribution main would be the same as in Alternative N-A.• The second main would extend from a new pump station at the Coronado site along Louisiana Boulevard, San Antonio Drive, Harper Road, Barstow Street, and North Pino Arroyo to a new pump station and reservoir to be located in Heritage Hills Park, west of Ventura Street.• The third main would extend from the new pump station and reservoir to be located in Heritage Hills Park along North Pino Arroyo, Holbrook Street, Coronado Avenue, and Eubank Boulevard to a new pump station and reservoir located on the east side of Eubank Boulevard, between San Rafael Avenue and Del Rey Avenue.• The fourth main would extend from the new pump station and reservoir located on Eubank Boulevard along Eubank Boulevard and San Antonio Drive.• The fifth main would extend along Ventura Street, Pino Arroyo, Academy Road, Moon Street, and Bear Canyon Arroyo.• The sixth main would extend along Ventura Street, San Francisco Road, Barstow Street, Wilshire Avenue, and South Domingo Baca Arroyo.

The Southside Water Reclamation Plant Reuse Project feasibility study identified three possible water distribution system alternatives. These three possible distribution systems, described in Table 2.2-2 as S-A, S-B, and S-C, were evaluated using the same monetary and non-monetary factors (CH2M Hill, 1999c) that were used for the Non-potable Surface Water Reclamation Project.

**TABLE 2.2-2
SOUTHSIDE WATER RECLAMATION PLANT REUSE PROJECT
ALTERNATIVES**

Alternative	Features
S-A	<p>Would serve six potential users. A new pump station and reclaimed water treatment facilities would be located at the City's Southside Water Reclamation Plant.</p> <ul style="list-style-type: none"> • The only distribution main would extend from the Southside Water Reclamation Plant along Second Street, Rio Bravo Boulevard, University Boulevard, Randolph Road, Yale Boulevard, Gibson Boulevard, and Wellesley Drive to a new storage reservoir to be located near Puerto del Sol Golf Course.
S-B	<p>Would serve six potential users. A new pump station and reclaimed water treatment facilities would be at the same location as Alternative S-A.</p> <ul style="list-style-type: none"> • The first distribution main would extend from the Southside Water Reclamation Plant along Second Street, Woodward Road, William Street, San Jose Avenue, Broadway Boulevard, Gibson Boulevard, and Wellesley Drive to a new storage reservoir to be located near Puerto del Sol Golf Course. • The second main would extend from Second Street, along Rio Bravo Boulevard, and along University Boulevard.
S-C	<p>Would serve 16 potential users. A new pump station and reclaimed water treatment facilities would be at the same location as Alternative S-A.</p> <ul style="list-style-type: none"> • The first distribution main would extend from the Southside Water Reclamation Plant along Second Street, Woodward Road, William Street, San Jose Avenue, Broadway Boulevard, and Kathryn Avenue. • The second main would extend from Second Street along Rio Bravo Boulevard, University Boulevard, Randolph Road, Yale Boulevard, Chavez Boulevard, University Boulevard, and Basehart. • The third main would extend from Yale Boulevard, along Alamo Avenue, Miles Road, Girard Boulevard, Gibson Boulevard, and Wellesley Drive to a new storage reservoir and a booster pump station to be located near Puerto del Sol Golf Course. • The fourth main would extend from Wellesley Drive, along Smith Avenue and Kathryn Avenue and from Kathryn Avenue along San Pedro Drive.

Alternatives S-A, S-B, and S-C all would use reclaimed water from the wastewater treatment plant as the source of water. As seen in Table 2.2-2, the three Southside Water Reclamation Plant Reuse Project alternatives differed primarily in the number of users to be served and in the routing of the system distribution pipelines. Alternatives S-A and S-B each would serve six potential customers, and would have shorter conveyance routes.

Alternative S-C would serve 16 potential customers, and would have the longest conveyance route.

2.3 ALTERNATIVES SCREENED FROM FURTHER CONSIDERATION

The initial screening of suitability and feasibility of using non-potable surface water and municipal wastewater was performed during the AWRMS development process (CH2M Hill, 1997a). As described in the AWRMS documents (CH2M Hill, 1997a, 1997b, 1997c, and 1997d), numerous alternatives were evaluated for supply, cost, and environmental considerations. Because of the thoroughness, comprehensiveness, peer review, and technical adequacy of those analyses, it was concluded that this EA screening process did not need to repeat those analyses, but could instead rely on those results to define the alternatives.

The five potential distribution alternatives described in Table 2.2-1 and 2.2-2 were further screened and evaluated to assess conformance with project goals and objectives (CH2M Hill, 2000a and 2000b). Those goals and objectives were embodied within the five general categories and associated performance measures shown in Table 2.3-1.

**TABLE 2.3-1
 SCREENING CATEGORIES AND PERFORMANCE MEASURES**

Category	Performance Measures
Environmental	Biological resources (endangered species and wetlands/riparian areas), cultural resources (known resources, potential for resources, and traditional properties), and historical/current land uses
Quality of life	Joint use opportunities, public support, and potential users
Implementability	Staged construction, adjacent land use, and constructability
Sustainability	Reliability and future expansion
Cost factors	Capital costs and operations and maintenance (O&M) costs

The screening used evaluation criteria associated with each performance measure that focused on identifying fatal-flaw-type characteristics, which would rapidly preclude a potential alternative from moving to detailed evaluation. The purpose was to identify the alternative for both the Non-potable Surface Water Reclamation Project and the Southside Water Reclamation Plant Reuse Project that best satisfied the five general categories. These preferred alternatives were carried forward in the review process and evaluated as elements of the Proposed Action in this EA.

Performance measures for the environmental category (CH2M Hill, 2000a and 2000b) included 13 criteria for biological resources, seven criteria for cultural resources, and seven criteria for historical and current land uses. The criteria addressed endangered species, wetlands and riparian areas, known and potential cultural resources, traditional properties, land use compatibility, hazardous waste sites, and incompatible current or historic uses.

The quality of life category was an indicator of the potential impacts of a reclaimed water system on adjacent neighborhoods and other private or public facilities that would potentially be served by the proposed facilities. Performance measures associated with the quality of life category included joint use opportunities, which would have the potential to maximize public dollars and public use of lands; public support; and the potential to provide reliable service to the greatest number of users.

The implementability category was a measure of the ability to construct, operate, and maintain the pipelines, pump stations, and reservoirs for each alternative. Performance measures included ability for staged construction based on such factors as funding restrictions; adjacent land use, which considered existing or proposed land uses that could affect the construction, operation, and maintenance of the reclaimed water facilities; and the ability to construct the project with current construction means and methods.

The sustainability category measured the ability of each alternative to meet the goals of the project by providing reliable service to the greatest number of potential customers over the long term. Performance measures included reliability (amount of potable water saved by each alternative) and future expansion (ability of each alternative to provide reclaimed water to future users).

Performance measures associated with the cost category included capital cost (primarily associated with project design and construction) and long-term O&M (Operations and Maintenance) costs.

Results of the screening and evaluation process identified Alternative N-A as the preferred alternative for the Non-potable Surface Water Reclamation Project, and Alternative S-C as the preferred alternative for the Southside Water Reclamation Plant Reuse Project.

- For the Non-potable Surface Water Reclamation Project, Alternative N-A scored above Alternative N-B for the quality of life, implementability, and cost criteria, and the same as Alternative N-B for the environmental and sustainability criteria. Therefore, Alternative N-B was eliminated from further consideration and analyses.
- For the Southside Water Reclamation Plant Reuse Project, Alternative S-C scored substantially above both Alternatives S-A and S-B for the quality of life, implementability, and sustainability criteria, and only slightly below Alternative S-A for the environmental and cost criteria. Therefore, Alternatives S-A and S-B were eliminated from further consideration and analyses.

A sensitivity analysis was performed to determine if weighting the categories would affect the screening results. The sensitivity analysis showed that Alternative N-A (Non-potable Surface Water Reclamation) and Alternative S-C (Southside Water Reclamation Plant Reuse) consistently had the best overall performance regardless of the relative importance assigned to the evaluation criteria.

Technical memoranda discussing the water system distribution alternatives, general evaluation criteria, performance measures used to evaluate the alternatives, relative importance of each of the evaluation criteria, methods used to calculate the results, and re-

sults and recommendations for the five alternatives are presented in CH2M Hill (2000a) for the Non-potable Surface Water Reclamation Project and CH2M Hill (2000b) for the Southside Water Reclamation Plant Reuse Project.

2.4 DESCRIPTION OF ALTERNATIVES

2.4.1 Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque (Proposed Action)

Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque consists of two projects – the Non-potable Surface Water Reclamation Project and the Southside Water Reclamation Plant Reuse Project.

Detailed engineering, screening, and operational information for these two projects are provided in the *Non-potable Surface Water Reclamation Project Feasibility Study* (CH2M Hill, 1999b) and the *Southside Water Reclamation Plant Reuse Project Feasibility Study* (CH2M Hill, 1999c). Figures 2 and 3 illustrate potential users. The locations and total acres of area to be treated with this water are summarized in Table 2.4-1.

The Non-potable Surface Water Reclamation Project would use some of the City's allotment of approximately 1,700 ac-ft/yr. of an available total of 48,200 ac-ft/yr. of San Juan-Chama surface water. The water would be diverted from the Rio Grande south of Alameda Boulevard by a new subsurface water diversion facility. This reclaimed surface water would be mixed with industrial wastewater as part of a separate project in the North I-25 area.

The reclaimed surface water from the Non-potable Surface Water Reclamation Project would replace the use of higher quality, deep-aquifer ground water at 28 locations in the Northeast Heights area. Also, approximately 856 ac-ft/yr. of surface water from the Non-potable Surface Water Reclamation Project would be used to supplement the supply of industrial wastewater to meet a portion of the demands of the users in the Industrial Recycling Project. In the future, up to 58 acres of medians and similar areas also might receive water from this project. The Non-potable Surface Water Reclamation Project water would be used for such purposes as turf irrigation in parks, golf courses, and greenbelts; industrial manufacturing water; and industrial cooling water.

The proposed Southside Water Reclamation Plant Reuse Project would replace the use of high-quality, deep-aquifer ground water with treated municipal wastewater effluent from the Southside Water Reclamation Plant. This effluent currently is treated to meet federal and state water quality standards, and then is discharged to the Rio Grande. Under the Proposed Action, the wastewater effluent would be further treated to meet standards for non-potable reuse. The reclaimed effluent would be used for turf irrigation in parks, golf courses, and greenbelts at 16 locations in the southern part of the City, with the potential to add an additional 66 acres of medians and similar areas in the future. In addition, 93 ac-ft/yr. would be used for industrial cooling water at one location.

Figure 2 Non-potable Surface Water Reclamation Project Distribution System

Figure 3 Southside Water Reclamation Plant Reuse Project Distribution System

**TABLE 2.4-1
POTENTIAL NON-POTABLE TURF IRRIGATION AND
INDUSTRIAL WATER USERS^{a/}**

Identified Users for Non-potable Water	Irrigated Area (acres)	Average Water Use (ac-ft/yr.)
Non-potable Surface Water Reclamation Project		
Turf irrigation		
Arroyo del Oso Golf Course	155	517
Louisiana and San Antonio Rd.	4	13
Arroyo del Oso Park	17	57
Sister Cities Park/Arroyo del Oso School	4	13
Tanoan Golf Course	187	623
El Oso Grande Park	14	47
Hope Christian School	2	7
Presbyterian Hospital Grounds	29	97
Osuna Park/Elementary School	2	7
Albuquerque Academy	30	100
Hoffmantown Church	5	18
Heritage Hills Park	31	103
Sandia Memory Gardens	12	40
Albuquerque Sportsplex	7	23
Edmund G Ross Elementary School	4	13
Dennis Chavez Elementary School	1	3
New Park	5	17
Rancho de Palomas Park	5	16
Sycamore Plaza	4	15
La Cueva High School	12	40
North Domingo Baca Arroyo Park	25	83
Academy Hills Park	12	40
Jade Park	2	7
Ed Leslie Park	2	7
Loma del Norte Park	11	37
Del Norte High School	12	40
Novella Park	2	7
Future industrial recycling turf areas ^{b/}	257	856
Medians/futures	58	193
Subtotal	911	3,038
Southside Water Reclamation Plant Reuse Project		
Turf irrigation		
UNM (Univ. of New Mexico) South Golf Course	240	800
Puerto del Sol Golf Course	72	240
Regional Recreation Complex	51	202
Albuquerque International Sunport	28	94
Barelas Railroad Park	12	38

Identified Users for Non-potable Water	Irrigated Area (acres)	Average Water Use (ac-ft/yr.)
Bullhead Park	42	141
Chavez Park	7	24
Ethicon	3	10
Phil Chacon Park	58	195
San Jose Park	4	12
Spirit/Clark Carr Road	42	142
Sunport Boulevard/Park	2	8
Roosevelt Park	27	92
University Stadium/Sports Complex	34	112
Kirtland Park	8	29
Medians/future	66	223
Subtotal	696	2,362
Industrial users		
PNM/Cobisa	0	93
Subtotal	0	93
Total annual potential demand	1,609	5,493

a/ Source: CH2M Hill, 1999b and 1999c. Small difference in quantities occur due to rounding.

b/ Surface water from the Non-potable Surface Water Reclamation Project would also be used to supplement the supply of industrial wastewater to meet a portion of the demands of the users in the Industrial Recycling Project service area.

The two components of the Proposed Action would provide 5,493 ac-ft/yr. to identified users. This would include:

- 3,038 ac-ft/yr. for the Non-potable Surface Water Reclamation Project. In order to affect a net zero change in Rio Grande flows below the diversion facility, approximately 1,700 ac-ft/yr. (on average) of the City's San Juan-Chama water will be released from Abiquiu Reservoir (See Section 3.5.2.2 Surface Water for further discussion).
- 2,455 ac-ft/yr. for the Southside Water Reclamation Plant Reuse Project service area. This entire volume of water would consist of treated wastewater effluent.

The Non-potable Surface Water Reclamation Project and Southside Water Reclamation Plant Reuse Project would represent the second and third components of the overall water reclamation and reuse program for the AWRSI. Depending on the availability and timing of construction funds, the project may be constructed in two stages. These are designated Phases A and B in the project feasibility studies (CH2M Hill, 1999b and 1999c). The following descriptions do not distinguish between these phases.

2.4.1.1 Non-potable Surface Water Reclamation Project

The Non-potable Surface Water Reclamation Project would include a new subsurface water diversion facility to capture San Juan-Chama water. The diversion structure would be located adjacent to the Rio Grande approximately 1,000 feet south of the bridge at

Alameda Boulevard. Construction activities would occur only on the east bank of the river. A conceptual design of the reclaimed subsurface water diversion facility, which would include the following features, is shown on Figure 4. The location of the diversion structure is shown on Figure 2.

- A reinforced concrete caisson would be located approximately 80 feet from the existing floodway.
- Four well screens approximately 200 feet long and projecting radially from the caisson would collect subsurface water from below the river. The radial collector arms would be jacked out from the caisson approximately 50 feet below grade. The subsurface water diversion facility would be designed to minimize contamination of diverted water by fines and sediments from the river.
- Two horizontal well screen collectors, each approximately 500 feet long, would be constructed in the riverbed, approximately 25 feet below grade. The horizontal collectors would be located approximately 400 feet from the radial collector well caisson, one on each side of the caisson.
- A reinforced concrete valve box would be constructed on the riverbank at the end of each of the horizontal collectors.
- A 24-inch-diameter pipeline would convey the subsurface water from the valve boxes to the radial collector well caisson.

To conform to U.S. Army Corps of Engineers (Corps) Section 404 nationwide permit requirements, the riverbed construction would occur during the months of lowest flow within the river. A temporary dam would be placed within the river, and flows would be diverted to the west side of the channel. Pilings or similar structures would be used for this purpose. Figure 5. shows the construction features of the subsurface diversion facility.

Figure 4 Non-potable Surface Water Reclamation Project Reclaimed
Water Diversion

Figure 5 Non-potable Surface Water Reclamation Project-Construction Features of Sub-surface Diversion Facility

Dewatering behind the dam would allow for excavation of the riverbed to place the horizontal well screen collectors below grade. The collector pipe would be placed within the excavation and then backfilled.

The pump station that would pump the reclaimed surface water to the blend tank at the Honeywell site would be located on top of the radial collector well caisson. The caisson would serve as the wet well for the pumps. The pumps would convey the reclaimed water from the caisson to the transmission main on Alameda Boulevard through a 24-inch-diameter pipeline.

The pump station would be constructed on fill to prevent flooding. The floor of the pump station would be constructed at the same elevation as the top of the levee, approximately 8 feet above the existing grade in the bosque. The station would contain four pumps, each with a capacity of 2,159-gallons per minute (gpm). One of the pumps would serve as a spare.

A gravel access road about 450 feet long would be constructed from the existing gravel road on the levee to the reclaimed water pump station. The access road would be constructed initially at the same height as the levee road, and then would be sloped to maintain conformity with any features in the bosque. Near the diversion structure pump station, the road would again be at levee road height.

The subsurface water diversion facility would be designed to serve the maximum-day demands of the users in the Non-potable Surface Water Reclamation Project service area and to supplement the demands of the users in the Industrial Recycling Project service area. The diversion pump station would have a firm capacity of approximately 9.3 million gallons per day (mgd).

A 1-million-gallon (MG) equalization reservoir has been constructed at the Honeywell site (Figure 2) as part of the separate North I-25 Industrial Recycling Project, described by CH2M Hill (1999a). At this location, the non-potable surface water from the Non-potable Surface Water Reclamation Project would be blended with recycled industrial wastewater (CH2M Hill, 1999a).

As part of the North I-25 Industrial Recycling Project, an existing pump station located at the Honeywell site would pump the blended water from the equalization reservoir to a 2.5-MG (Million Gallons), aboveground, non-potable storage reservoir at the Coronado site (Paseo del Norte and Louisiana Boulevard). This storage reservoir was constructed as part of the North I-25 Industrial Recycling Project.

As part of the Non-potable Surface Water Reclamation Project, a new pump station with a firm capacity of approximately 5.6 mgd would be located adjacent to the Coronado site. This facility would pump the non-potable water from the 2.5-MG reservoir to a new, 0.6-MG storage reservoir and pump station (firm capacity of approximately 3.46 mgd) to be located at the east edge of Arroyo del Oso Park, near the existing City green houses.

From the Arroyo del Oso Park location, non-potable water would be pumped to a new 1.1-MG storage reservoir, located at the east edge of El Oso Grande Park. The new pump station at this site would have a firm capacity of approximately 1.9 mgd.

From the El Oso Grande Park location, non-potable water would be pumped to a lake on the Tanoan Golf Course, which would be the terminus of this portion of the project. Throughout the service area, users would access the transmission mains to receive non-potable irrigation water service.

Three existing potable City water wells are located relatively close to the proposed site of the reservoir adjacent to Arroyo del Oso Park. Currently, wash water (potentially up to 24 acre feet per year) from water well maintenance is discharged to a nearby arroyo or a storm sewer and is lost from the potable water system. After construction of the Non-potable Surface Water Reclamation Project, these wash lines would be connected to the non-potable storage reservoir. The water that currently is lost would be captured and stored in the reservoir for use in turf irrigation.

2.4.1.2 Southside Water Reclamation Plant Reuse Project

The Southside Water Reclamation Plant Reuse Project would include a new reuse treatment system, two pump stations, transmission piping and appurtenances, and a storage reservoir.

The reuse treatment facility would use a mechanical filtration treatment system to produce higher quality effluent. This facility would consist of influent pumping, pre-chlorination, coagulant chemical feed, mechanical filtration, final disinfection, a combined clearwell and onsite reservoir, and high-lift pumping to the reuse distribution system. This facility would be located on existing City-owned property at the Southside Water Reclamation Plant, and would have a capacity of 5.74 mgd.

As shown in Figure 3, a 5.74-mgd high-lift station would be constructed adjacent to the filtered water clearwell/reservoir. This station would pump the non-potable water into the transmission and distribution system, and to a new 1.9-MG storage and control reservoir near the Puerto del Sol Golf Course. Pumping from the reuse treatment facility would be in response to the water level in the upper reservoir.

A new 0.81-mgd booster pump would be located adjacent to the 1.9-MG storage and control reservoir near the Puerto del Sol Golf Course. This pump station would supply water to users, and in the future could pump water to additional storage in the higher service areas.

2.4.1.3 Features Common to Both Elements of the Proposed Action

Table 2.4-1 lists the potential non-potable turf irrigation and industrial water users' anticipated water quantities, locations, and acreages. Users and pipeline routes for the Non-Potable Surface Water Reclamation Project are identified in Figure 2. Users and pipeline routes are in Figure 3 for the Southside Water Reclamation Plant Reuse Project. Characteristics of the Proposed Action are summarized in Table 2.4-2. The No Action alterna-

tive is not included in any of the tables or figures because without federal action, facilities would not be constructed.

The distribution piping for both routes would range in diameter from 6 inches to 24 inches. The pipelines would be constructed of such materials as ductile iron, polyvinyl chloride (PVC), or concrete cylinder pipe. The pipelines would be differentiated from potable water lines by being purple in color, in conformance with industry standard.

Seasonal fluctuations in water demand for turf irrigation may result in some of the reclaimed water not being used during the winter. Industrial demand for the reclaimed water would be expected to be fairly constant year-round but, based on the user data in Table 2.4-1, would represent only about 2 percent of the reuse. During periods of low water demand, any excess reclaimed water would be sent to the City Southside Water Reclamation Plant for processing and discharge to the river. All of the Southside Water Reclamation Plant connections and treatment capacities for processing unused reclaim water are already in place.

The pipeline alignments within City streets would be placed within existing utility rights-of-way and would only disturb the paved section of the street. In unpaved areas, the total width to be affected by construction activities is estimated to be 25 feet. The pipelines would be bored under many of the major road and arroyo crossings to avoid traffic disruptions or the demolition and replacement of arroyo linings.

Tables 2.4-3 and 2.4-4 list the length of pipeline and asphalt removal for the Non-Portable Surface Water Reclamation Project and the Southside Water Reclamation Plant Reuse Project, respectively. Pipelines would be laid in a trench approximately 6 feet deep. The trench would disturb an area approximately 4 feet wide.

The construction period duration for the Non-potable Surface Water Reclamation Project would be about 24 months. Construction of the Southside Water Reclamation Plant Reuse Project would require about 18 months. Because the pipelines could be installed at a rate of 400 to 500 feet per day, construction activities would be brief near any location. Boring of the pipeline under Interstate 25 (I-25) would take about 1 week for each conveyance route.

**TABLE 2.4-2
SUMMARY OF FEATURES FOR THE PROPOSED ACTION**

Characteristics	Units	Non-potable Surface Water Reclamation Project	Southside Wa- ter Reclamation Plant Reuse Project	Total
Structural				
Total length of buried pipeline	LF ^{a/}	98,305	102,673	200,978
Total length of pipeline in public street ROWs (Right-of-Way)	LF	85,155	91,633	176,788
Total length of pipeline in undeveloped open space	LF	13,150	11,040	24,190
Total length of asphalt pavement removal/replacement	LF	80,650	83,645	164,015
Total area disturbed for ROWs	Acres	11.7	12.6	24.3
Total area disturbed for ROWs through undeveloped open space	Acres	1.8	0.2	2.0
Total of intersection crossings (constructed or bored)	Number	69	56	125
Total length of bored crossings	LF	2,100	1,400	3,500
New water storage reservoirs	Number	2	1	3
New water storage reservoir dimensions	Feet	22feet high, 100 ft diameter 22 feet high, 72 ft diameter	22 feet high, 128 feet diameter	
New water storage reservoir capacities	MG	1.1 0.6	1.9	3.6
Storage capacities of North I-25 Industrial Recycling Project reservoirs that also are used for the Proposed Action	MG	1 2.5		3.5
Area required for <i>new</i> storage reservoir construction	Acres	2.7	2.7	5.4
Location of new storage reservoirs	--	Osuna and Wyoming; El Oso Grande Park	Thaxton and Wellesley	
New pump stations required	Number	4	2	6
New pump station capacity	Mgd	9.3; 5.55; 3.46; 1.89	5.74; 0.81	26.75
Area required for new pump station construction	Acres	0.6	0.6	1.2

Characteristics	Units	Non-potable Surface Water Reclamation Project	Southside Water Reclamation Plant Reuse Project	Total
New pump station location	--	Coronado; Osuna and Wyoming; El Oso Grande Park, South of Alameda	Thaxton and Wellesley	
Operational				
Total volume of San Juan-Chama water diverted from the Rio Grande annually	Ac-ft	1,700	0	1,700
Total park/open space sites to potentially be irrigated	Number	28	16	44
Total area to be potentially irrigated	Acres	911	698	1,609
Total industries potentially receiving water	Number	0	1	1
Average annual non-potable water demand for designated turf irrigation and industrial users	Ac-ft	3,038	2,455	5,493
Average annual non-potable water demand for designated industry users	Ac-ft	0	93	93
Total average annual non-potable water volume available	Ac-ft	3,038	2,455	5,493
Total average net annual volume of ground water that will not be withdrawn with project implementation	Ac-ft	2,185	2,455	4,640
Total construction cost	Dollars	\$23,104,300	\$11,988,300	\$35,092,600
Average annual operation and maintenance cost	Dollars	470,200	345,000	851,200
Construction duration	Months	24	18	
Operational life	Years	50	50	50

a/ Acronyms and abbreviations

Ac-ft	acre-feet	MG	million gallons
kWh	kilowatt hours	mgd	million gallons per day
LF	linear feet	ROW	right-of-way

**TABLE 2.4-3
 LENGTH OF PIPELINE AND ASPHALT REMOVAL FOR NON-POTABLE
 SURFACE WATER RECLAMATION PROJECT ^{a/}**

Location	Length in Linear Feet			Asphalt Re- moval
	In Road ROW ^{b/}	Along Arroyo	Total Length	
Alameda	15,780	0	15,780	15,000
Washington	2,500	0	2,500	2,500
Jefferson	2,000	0	2,000	2,000
Wilshire	3,945	0	3,945	3,945
San Pedro	2,630	0	2,630	2,630
Paseo del Norte	2,720	0	2,720	2,720
Louisiana	14,465	0	14,465	14,465
Glendale	1,500	0	1,500	500
Jade Park	1,800	0	1,800	1,800
Harper	2,500	0	2,500	2,500
Barstow	6,575	0	6,575	6,000
Wilshire	1,000	0	1,000	1,000
Domingo Baca Arroyo	0	1,750	1,750	0
Ventura/San Francisco	2,275	0	2,275	2,275
Moon	6,000	0	6,000	5,000
Arroyo del Oso	0	10,200	10,200	0
Eubank	5,100	0	5,100	4,500
Juan Tabo	1,800	0	1,800	1,800
Camero	1,315	0	1,315	1,315
Carruthers	500	0	500	500
Academy	500	0	500	500
Osuna	3,750	0	3,750	3,500
San Pedro	500	0	500	500
Whisperwood	250	0	250	200
Montgomery	500	0	500	500
Reservoir/ Oso Grande ^{c/}	600	0	600	0
Reservoir/Osuna ^{c/}	600	0	600	0
San Antonio	5,250	0	5,250	5,000
Total	86,355	11,950	98,305	80,650

a/ Source: CH2M Hill, 1999b.

b/ ROW = right-of-way.

c/ Stubout to supply lines.

**TABLE 2.4-4
 LENGTH OF PIPELINE AND ASPHALT REMOVAL FOR SOUTHSIDE
 WATER RECLAMATION PLANT REUSE PROJECT ^{a/}**

Location	Length in Linear Feet			Asphalt Re- moval
	In Road ROW ^{b/}	Along Arroyo	Total Length	
2nd Street	13,140	0	13,140	13,000
Rio Bravo	6,580	0	6,580	6,500
San Jose	2,630	0	2,630	2,600
Kathryn	2,600	0	2,600	2,500
Woodward	1,000	0	1,000	850
Williams	1,500	0	1,500	1,500
Broadway	6,400	0	6,400	6,000
University	15,768	0	15,768	12,000
Randolph	3,600	0	3,600	3,200
Alamo/Miles	3,500	0	3,500	3,200
Sunport	3,945	0	3,945	3,945
Yale	6,700	0	6,700	6,500
Reservoir Near Puerto del Sol ^{c/}	450	0	450	0
Caesar Chavez	2,620	0	2,620	2,500
University	1,000	0	1,000	1,000
Basehart	780	0	780	700
Smith	3,900	0	3,900	3,900
Puerto del Sol Golf Course	2,000	0	2,000	0
Kathryn	9,500	0	9,500	9,500
San Pedro	4,500	0	4,500	4,250
Total	92,113	0	92,113	83,645

a/ Source: CH2M Hill, 1999c.

b/ ROW - right-of-way.

c/ Stubout to supply lines.

The City would monitor ground water quality in the project area to ensure that the project meets New Mexico Environment Department (NMED) and Ground Water Protection Policy and Action Plan (GPPAP) requirements (Albuquerque, City of and Bernalillo County, 1995).

Environmental protection measures to be incorporated into the design and construction of the project are discussed for each resource category in Affected Environment and Environmental Consequences (Section 3). Engineering design features and mitigation measures are summarized in Environmental Commitments (Section 4).

2.4.2 No Action Alternative

The No Action alternative would not involve creating physical structures or withdrawing water from the Rio Grande. Existing conditions and trends would be maintained.

These proposed second and third increments in implementing the objectives of the AWRMS would not take place. This would involve not implementing a conjunctive use management approach as the basis for reducing demand on the ground water aquifer and providing a sustainable supply, and not preserving the ground water aquifer as a primary drought reserve.

The City's potable water is currently obtained from deep ground water sources. The No Action alternative would require the continued use of deep ground water to meet current and future water demands, which would continue the current trend of depleting aquifer quantity and encouraging land subsidence in some areas. Alternative water supply sources would need to be acquired or developed when the ground water source could not meet demand. This action would conflict with the AWRMS and would continue the current drawdown and depletion of the deep aquifer. The No Action alternative would not meet the project purpose and need.

SECTION 3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes the affected environment and potential environmental consequences of implementing the Proposed Action and the No Action alternative. The project issues in this section reflect the specific environmental concerns that were identified during scoping meetings with agencies and the public (Appendix B). Environmental commitments that would reduce or eliminate identified environmental effects of the alternatives are identified.

3.1 EVALUATION OF ENVIRONMENTAL RESOURCES

The environmental resources of the project area were divided into two groups:

- Resources that require detailed evaluation. These were identified in scoping meetings with the City, the lead federal agency (Reclamation), involved federal agencies, the pueblos, and the public.
- Resources that were not evaluated in detail because of the lack of identified project effects or public and regulatory concerns. These resources were not identified with specific concerns during the scoping process.

Issues identified for each resource category during the scoping process are addressed by the environmental effect analysis. A summary of identified resource issues is presented in Table 3.1-1. The detailed comments are included in Appendix B.

Many other issues related to design, construction, and operation of this project, the AWRMS and AWRSI, and water supply in general also were identified during the scoping activities. Although these questions and concerns are beyond the scope of this EA, they are included in Appendix B of this document.

3.2 ENVIRONMENTAL EFFECTS ANALYSIS APPROACH

The environmental effects analysis was performed by evaluating the location and scope of the Proposed Action's activities and structural facilities in relation to the existing environment of the project area. The interaction of project and environment was examined for each resource area for the issues that were identified during agency and public scoping. Resource-specific evaluation criteria were developed and applied to the interaction of the Proposed Action and existing resource conditions to determine if an effect would occur and to estimate its importance.

**TABLE 3.1-1
 RESOURCE CATEGORIES AND ISSUES ADDRESSED IN THIS EA**

Resource Category	Specific Issues Addressed
Water resources	Effects of project operation and construction on ground water and surface water quality, ground water recharge and/or depletions, return flow amounts to the Rio Grande, effects on general river flows, effects on minimum flows in the river, salt levels in reclaimed water, increased drought reserve, and water conservation.
Biological resources	Effects on threatened and endangered species and their habitats (particularly the Rio Grande silvery minnow and its designated critical habitat), wetlands, riparian area protection and maintenance, and associated fish and wildlife.
Aesthetics/visual resources	Intrusion of non-potable water storage reservoirs and other reclaimed non-potable water facilities on nearby residents' views.
Traffic and circulation	Effects of construction activities on traffic, and locations of buried pipelines in neighborhood streets.
Soils and vegetation	Effect of potential buildup of salts in soil and its ability to support vegetation, and effects of residual chlorine on vegetation irrigated with reclaimed water.
Cultural resources	Effects of construction activities on archaeological/cultural/historical resources.
Socioeconomic factors	Effects of an increase in water rates to City customers, how the City's diversion of its water would affect water diversions by other entities, who will pay for the cost of the project, and changes in construction and permanent employment.
Noise and vibration	Effects of construction and operational activities on nearby residents, and treatment plant pump noises during operations at all facilities.
Human health and safety	Potential for cross-connections with the potable water system.
Indian trust assets	Effects on water supply, water quality, and the riparian ecosystem on Pueblo of Sandia, and Pueblos downstream of the water return point.
Air quality	Generation of emissions and dust by construction activities.
Environmental justice	Disproportionate effects on minority or low-income populations.
Recreation	Effects of construction, operation, and maintenance on hike and bike trails, and the need to coordinate trail location with surface water diversion facility clearings.
Land use	Effects on land use and prime or unique farmland.
Floodplains	Effects on floodplains
Energy	Not identified as an issue. Because of no apparent substantial project-induced effects, this category was not evaluated further.
Geology	Not identified as an issue. Because of no apparent substantial project-induced effects, this category was not evaluated further.
Hazardous and toxic wastes	Not identified as an issue. Because of no apparent substantial project-induced effects, this category was not evaluated further.

Quantitative changes in the resource criteria were estimated and are presented in three locations in this EA.

- A summary of all of the criteria and evaluation results is presented in Table 2.1-1.
- Criteria for which beneficial or adverse effects would occur are presented in this section in tabular fashion within the applicable resource discussion.
- Resource evaluation criteria that were considered during the analysis, but for which there would be no anticipated direct, indirect, or cumulative adverse or beneficial effects are listed in Appendix D. These criteria are included to document that the issues embodied by the criteria were evaluated and were determined to be unaffected by the Proposed Action and its alternative.

The project evaluation incorporated design features that are intended to minimize or eliminate potential environmental effects (referred to as environmental design features). These features are typically included in projects to address regulatory requirements for environmental protection. Examples include best management practices (BMPs) that routinely are associated with construction activities or resource management. The effects evaluation was performed assuming that these design features would be implemented or otherwise in place.

All resource effects analyses were conducted in the following steps:

- Define the resource environment in the project area.
- For each issue identified during scoping, define the criteria with which the resource effects will be evaluated.
- Evaluate the Proposed Action, including environmental design features, and the No Action alternative to determine the extent, magnitude, and type of resource changes resulting from potential direct, indirect, and cumulative effects.
- Identify, compile, and separately evaluate the potential consequences of direct, indirect, and cumulative changes of each resource that would be altered or affected.
- Identify effects that would be of a magnitude great enough to cause adverse or undesirable resource changes of concern, based on stated evaluation criteria.
- Recommend mitigation measures for effects identified as being of a magnitude great enough to cause adverse or undesirable resource changes of concern.
- Evaluate the anticipated effectiveness of the recommended mitigation measures.
- Determine whether the net effect of incorporating the mitigation measures and the design features would effectively mitigate potential adverse effects, or whether an effect of substantial concern would remain from the Proposed Action.

- Determine whether the Proposed Action qualifies for a finding of no significant impact (FONSI), or whether it would require further evaluation through the environmental impact statement (EIS) process.

3.3 ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Reclamation's guidance for implementing NEPA (Reclamation, Bureau of, 1997a) requires that the EA identify environmental commitments that Reclamation and/or the project sponsors (the City) are committed to carry out, should the project be implemented. Identifying environmental commitments discloses the intentions and commitment of the City to minimize effects on the environmental resources.

This EA identifies environmental commitments as both environmental design features and mitigation measures. Environmental design features are elements of the proposed project design such as BMPs that are intended to minimize or avoid potential environmental effects. Mitigation measures are steps, activities, or changes to the project that are implemented to offset an effect that would otherwise result in an undesirable adverse change of the resource.

For each resource in this section, environmental design features and mitigation measures are addressed separately. All project environmental commitments are summarized in Section 4. Unless otherwise noted, it was assumed that the same environmental commitments would be applied to all applicable components of the Proposed Action.

3.4 AREA OF EVALUATION

The same evaluation area was used for determining environmental effects for the Proposed Action and the No Action alternative. From north to south, the overall EA evaluation area (Figure 1) included the following five subareas.

- A - Rio Grande Corridor from Abiquiu Reservoir to the Non-potable Surface Water Diversion (including El Vado and Heron Reservoirs).
- B - Rio Grande Corridor from the Non-potable Surface Water Diversion to the Southside Water Reclamation Plant Outfall.
- C - Rio Grande Corridor from the Southside Water Reclamation Plant outfall to the Isleta Diversion Dam.
- D - Non-potable Surface Water Reclamation Project Service Area.
- E - Southside Water Reclamation Plant Reuse Project Service Area.

These subareas were created to facilitate data collection, focus assessment efforts, and ensure that the areas most likely to be potentially affected by components of the Proposed Action were thoroughly and comprehensively evaluated within this large area.

A summary of the resources that were focused on in each subarea is presented in Table 3.4-1. The resources that were evaluated in detail for each subarea were different because the types of project activities and types of resources that might be affected varied among

subareas. The EA considered effects in terms of both the overall evaluation area and the subareas. Although project effects were primarily described in terms of changes to the overall evaluation area, discussions of effects address individual subareas as appropriate.

**TABLE 3.4-1
RESOURCE CATEGORIES AND APPLICABLE EVALUATION SUBAREAS**

Resource Category	Resource Evaluation Subarea				
	A	B	C	D	E
Water	X	X	X	X	X
Biological resources	X	X	X	X	X
Aesthetics and visual resource				X	X
Traffic and circulation				X	X
Soils and vegetation				X	X
Cultural resources				X	X
Socioeconomic factors				X	X
Noise and vibration				X	X
Human health and safety				X	X
Indian trust assets	X		X	X	X
Air quality				X	X
Recreation				X	X
Land use				X	X
Floodplains		X		X	X
Environmental justice				X	X

The exception to the evaluation areas shown in Table 3.4-1 was the area considered for cultural resource effects. Guidance from the New Mexico State Historic Preservation Office (SHPO) requires an evaluation area of up to 1 mile from the project boundary. Therefore, a perimeter distance of 1 mile from the outer boundary of surface disturbance was used to define the cultural resources evaluation area associated with Subareas D and E.

3.4.1 Subarea A – Rio Grande Corridor from Abiquiu Reservoir to Non-potable Surface Water Diversion Point

Subarea A includes the river channel and the associated riparian corridor from Abiquiu Reservoir south to a point immediately upstream of the anticipated construction zone for the proposed non-potable subsurface water diversion facility. This area includes almost 88 percent of the total length of the river corridor that was evaluated in this EA.

Abiquiu Reservoir is located on the Rio Chama, which is the largest tributary of the Rio Grande in New Mexico. The reservoir is located about 30 miles upstream of the Rio Chama and Rio Grande confluence. Abiquiu Reservoir represents the northern most terminus of the project evaluation area. The distance from the confluence (river mile (RM) 271) to the Non-potable Surface Water Reclamation Project Diversion point (RM 192) is 79 miles. The subsurface diversion would be located just south of the Alameda Boulevard Bridge, on the east bank of the river.

Because there are no proposed structural facilities located in this subarea, evaluations in Subarea A were limited to those resources that would be affected by hydrologic

changes in the river channel (Table 3.4-1). These included effects to water, biological resources, and Indian trust assets.

3.4.2 Subarea B – Rio Grande Corridor from Non-potable Surface Water Diversion Point to the Southside Water Reclamation Plant Outfall

Subarea B extends from the construction area of the proposed Non-potable Surface Water Reclamation Project diversion point downstream to the Southside Water Reclamation Plant outfall. This reach includes 15 miles of the Rio Grande channel, and represents about 8 percent of the total length of the river corridor that was evaluated.

A USGS gage that measures flow in the Rio Grande is located in this stretch of river at the Central Avenue Bridge (RM 183.4). The Southside Water Reclamation Plant outfall is located at RM 177. This stretch of the river is located within the city limits of Albuquerque. As shown in Table 3.4-1, resource evaluations focused on the water and biological resources.

3.4.3 Subarea C – Rio Grande Corridor from Southside Water Reclamation Plant Outfall to Isleta Diversion Dam

Subarea C incorporates the river channel and the associated riparian corridor from the Southside Water Reclamation Plant outfall (RM 177) to the Isleta Diversion Dam (RM 169). The 8 miles of river channel within this subarea represent just over 4 percent of the total river length that was evaluated. The Isleta Diversion Dam is the southernmost terminus of the overall project evaluation area. Resource evaluations, as shown in Table 3.4-1, focused on water, biological resources, and Indian trust assets.

3.4.4 Subarea D – Non-potable Surface Water Reclamation Project Service Area

Subarea D includes the north service area that would receive reclaimed water from the Non-potable Surface Water Reclamation Project. It is entirely within the city limits of Albuquerque. The north boundary is the Pueblo of Sandia Reservation. Other boundaries include Tramway Boulevard on the east, I-25 on the west, and Montgomery Boulevard on the south. The subsurface water diversion facility and its associated pumping facilities were included in this subarea. As shown in Table 3.4-1, all of the resource categories were evaluated in this subarea.

3.4.5 Subarea E – Southside Water Reclamation Plant Reuse Project Service Area

Subarea E, sometimes called the south service area, includes the Southside Water Reclamation Plant and the area that would receive reclaimed water from the Southside Water Reclamation Plant Reuse Project. It is entirely within the city limits of Albuquerque. The northern boundary is the Roosevelt Park area, the east boundary is Louisiana Boulevard, the west boundary is Second Street, and the south boundary is located at the Regional Recreation Complex at Mesa del Sol. As shown in Table 3.4-1, all of the resource categories were evaluated in this subarea.

3.5 WATER

The project-related water quality and quantity environmental issues identified during scoping activities are listed in Table 3.1-1. Most issues associated with the Proposed Action involve questions about changes to surface and ground water quantities, flow characteristics, and quality. This section is organized to separately address ground water and surface water resources.

3.5.1 Affected Environment

3.5.1.1 Ground Water

The City currently relies on ground water taken from the Santa Fe Group aquifer system to water turf in open space and park areas. The Proposed Action would supply reclaimed water for turf irrigation and industrial uses in the north and south service areas (subareas D and E). Under present conditions, industrial use rates of the reclaimed water remain fairly steady over a calendar year, while the amount of water applied for turf irrigation vary by month, depending on the temperature and water demand of the turf. Irrigation demands are typically the lowest in the winter and highest in the summer (CH2M Hill, 1999). The total annual future supply of water available from the surface water and wastewater projects would be 5,493 acre-feet per year (ac-ft/yr.) (CH2M Hill, 1999b and 1999c).

Depths to ground water throughout the project area vary from less than 10 feet near the river to over 800 feet in the northeast heights area of the City. In southern areas of the project, depths vary from less than 10 feet near the river, to over 400 feet near Puerto del Sol Golf Course. There may be small areas of perched shallow ground water within the project area. In general perched shallow ground water areas decrease in number heading east from the river. Figure 6 shows the potential effects of ground water caused subsidence. Aquifer studies were conducted during the 1950s and 1960s, inflating the amount of ground water available to Albuquerque.

3.5.1.2 Surface Water

The Rio Grande is the major surface water feature in the project area and will serve as the delivery system for both native and San Juan-Chama water for the Proposed Action. The flow regime of this river has been historically quite variable with total annual flows ranging from a maximum of 1.9 million acre-feet per year (ac-ft/yr.) in 1986 to a minimum of 0.2 million ac-ft/yr. in 1956 as measured at the Albuquerque gage. The period of flow monitoring extends from 1943 to the present. Highest monthly flows tend to occur in May at an average of about 2,920 cubic feet per second (cfs). Lowest monthly flows tend to occur in October at an average of about 380 cfs.

The City of Albuquerque has water rights to about 22,000 ac-ft/yr. of native Rio Grande flows and 48,200 ac-ft/yr. of imported San Juan-Chama water. The City's San Juan-Chama water is imported to the Rio Chama basin through tunnels from the San Juan River basin in Colorado and northern New Mexico. The San Juan-Chama water reaches the Rio Grande at the confluence with the Rio Chama at Española following release from Heron Reservoir located 84 miles upstream and Abiquiu Reservoir 30 miles upstream on the Rio Chama. Consequently, for pur-

Figure 6 Potential Future Effects of the 1960s Plan: Water Level Declines in the Albuquerque Metropolitan Area

poses of evaluating the hydrologic effects of the Proposed Action, the Abiquiu-to-Española reach of the Rio Chama, and the reach of the Rio Grande between Española and the Isleta Diversion (below Albuquerque) are of most interest. This reach extends an estimated 184 miles from Abiquiu Reservoir on the north to the Isleta Diversion Dam on the south terminus. Delivery from Heron to Abiquiu will remain in accordance with previous delivery arrangements. Abiquiu Dam and Reservoir are located in Rio Arriba county, New Mexico on the Rio Chama, 32 river miles from the confluence with the Rio Grande. The Corps of Engineers operates Abiquiu as a flood and sediment structure, as well as storage reservoir for San Juan-Chama water.

The major upstream water storage and regulation facilities affecting hydrologic conditions in the river are Abiquiu Reservoir, located on the Rio Chama about 164 miles upstream from the City, Cochiti Lake located on the Rio Grande about 50 miles upstream from the City, and the Angostura Diversion Dam about 17 miles upstream from the city.

Completed in the 1970's, Cochiti Lake (managed by the Corps) is essentially a run-of-the-river facility (i.e., no long-term storage) that serves to protect downstream reaches of the Rio Grande from flooding. Operation of Cochiti has resulted in reduced peak flows in the spring and, to a limited extent, the maintenance of late summer and fall flows in the river at Albuquerque.

The Angostura Diversion facility is located some 17 miles north of Albuquerque and has been in operation since the mid 1930s. During the March-October irrigation season, Angostura typically diverts 300 to 350 cfs from the Rio Grande for irrigation in the Albuquerque Division of the MRGCD. Some of the water diverted at Angostura, as in the case for diversions at Cochiti, returns to the river through wasteways and drain returns. However, virtually no historic data are available to quantify the volume or amounts of these returns.

Flows of the Rio Grande at Albuquerque have been measured since 1943 at the U.S. Geological Survey gage at Central Avenue Bridge. As indicated in Figure 7, a strong seasonal snowmelt runoff pattern is evident. The snowmelt runoff period generally begins in late March or early April and peaks in May or June. After June, mean monthly streamflow typically declines steeply into October due to the end of snowmelt and diversions for irrigation above Albuquerque at Cochiti Lake and the Angostura Diversion Dam. The cessation of irrigation in late October allows flows in the Rio Grande to increase through the fall and winter months. Since 1943, mean monthly flows at Albuquerque have ranged from a high of about 2,920 cfs in May to 380 cfs in October. Although not evident in the mean monthly flows shown in Figure 7, summer-fall thunderstorms can cause flows in June through September to temporarily increase dramatically, though only for a few weeks at a time. The duration of the flow increase is dependent on the pattern and duration of the storms.

As indicated in Figure 8, the addition of City San Juan-Chama water to the Rio Grande (San Juan-Chama releases have occurred since 1971) has been a minor component of total river flow. The addition of this water has caused no apparent change in the basic shape or magnitude of the river's annual or average monthly patterns. Since 1971,

total San Juan-Chama water arriving at the Otowi gage (south of Española) has averaged about 55,000 ac-ft/yr. Approximately half of the 55,000 ac-ft/yr. of San Juan-Chama water belonged to the City, much of which was used by MRGCD under various agreements. Average total Rio Grande flow at Otowi during the 1971-98 period of San Juan-Chama releases was 1.15 million ac-ft/yr. At Albuquerque, total Rio Grande flows for 1971-98 averaged about 1.0 million ac-ft/yr. Estimates (in progress, CH2M Hill, 2000c) suggest that less than 40,000 ac-ft/yr. (less than 4 percent) of the flow at Albuquerque for the period 1971-98 has been San Juan-Chama water.

Presently (2000), the City's SWRP treats and discharges an average of about 56 mgd (86 cfs, or about 62,500 ac-ft/yr.) of treated wastewater back to the river. This discharge does not vary much with season (Glass, 2000). At the point of discharge just below the Rio Bravo Bridge, the wastewater comprises about 2.9 percent of the river flow measured at Albuquerque during the highest flow month (2,924 cfs average in May) and about 23 percent of river flow during the lowest flow month (380 cfs average in October).

About 8 miles downstream of the City's wastewater outfall the Isleta Diversion Dam operated by the MRGCD typically diverts about 500 cfs of river water for agricultural crop irrigation within MRGCD's Belen Division. This diversion amounts to roughly one third of the river flow during a typical irrigation season of March 1 to October 31. Except for unusual circumstances, no water is diverted at Isleta during the November-February period.

The interaction of Rio Grande flows with the Albuquerque Basin ground water aquifer system is complex. Several ground water models have been developed over the years in an attempt to quantify the hydrologic linkages and relationship between the river and the ground water system. The earliest model was a Glover-Balmer (1954) computation used by the New Mexico Office of the State Engineer (based on simplifying hydrogeologic assumptions) that resulted in relatively high estimates of river losses to the Albuquerque Basin aquifer. Later, a USGS (1995) model suggested that the river losses estimated by the Glover-Balmer approach were too high. More recently, both the State Engineer and USGS have been working on refined models of the Albuquerque Basin groundwater system. Presently, the newest version of the USGS model is being used (CH2M Hill, 2000) to make estimates of the hydrologic effects of the AWRMS Project, including the Proposed Action, on the river.

Based on the most recent modeling work, it appears that the effects of the City's wells on the river have been offset by discharges from the City's wastewater treatment plant. The wastewater discharges have effectively returned about half of the pumped ground water to the river (City of Albuquerque, 2000). Conservation measures initiated by the City in the 1990s led to the present (2000) situation wherein an estimated 54 percent of the pumped ground water is returned by wastewater discharges (City of Albuquerque, 2000). The effects of changing the present river flow and ground water pumping regimes with the proposed action are described in 3.5.2.

Figure 7 Mean Monthly Flow at Albuquerque with and without city San Juan-Chama Contributions, 1943-1998



Figure 8 Schematic Representation of River Flow Effects

3.5.1.3 Water Quality

The water quality of three water systems or sources are of interest for the Proposed Action. These sources include the existing Rio Grande water quality, storm water runoff into the river in the Albuquerque area, and the effluent presently discharged from the Southside Water Reclamation Plant. Water quality within the Rio Grande itself is considered to be generally good (USGS, 1997). Total dissolved solids (TDS) can be used as a general indicator of water quality conditions. The general trend of this water parameter is increasing concentration with increasing distance downstream. Water quality from the Abiquiu reservoir is rated generally good. The imported San Juan-Chama water contains about 140 mg/L TDS, is of excellent quality, and improves the overall quality of Rio Grande basin water (Corps of Engineers, 1995). The mean TDS concentration in the Rio Grande at San Felipe was 213 mg/L (milligrams per litre), or ppm. (parts per million), increasing downstream to 263 mg/L at Los Lunas. The TDS concentrations in wastewater treatment outfalls ranges from 506 to 973 mg/L (USGS, 1997).

Basic water quality parameters previously were evaluated for the Draft Biological Evaluation for the City National Pollutant Discharge Elimination System (NPDES) permit application (Parsons ES, 1999) as part of the City's NPDES permit application for discharging storm water into the river. The parameters of interest included suspended solids, cadmium, copper, lead, zinc, water hardness, temperature, and pH. The analysis indicated water quality was considered to be generally good, was able to support aquatic organisms, and provided a suitable source of water for irrigation, municipal, and industrial uses. Dissolved oxygen concentrations from the Albuquerque location within the river were indicative of a typical warmwater stream. Typical concentrations are 6-9 ppmO₂.

Storm water runoff has been identified as having the potential to affect Rio Grande water quality (USGS, 1997). A recent evaluation of storm water discharges to the river based on the analysis of concentration data from six storm water monitoring locations (Parsons ES, 1999) indicated runoff from storm events into the river is higher in copper, lead, and zinc than background concentrations that are encountered in the river and the wastewater treatment plant outfall. Storm water discharges may also cause brief changes in appearance and color of the river near the storm water entry points. The duration of these effects is typically short.

The wastewater treatment plant effluent meets all primary water drinking standards. Unfiltered effluent has iron and TDS concentrations that equal or exceed secondary drinking water standards (CH2M Hill, 1999). The State of New Mexico has developed ground water limitation standards to protect the quality of the ground water in the state from degradation resulting from the discharge of liquids or solids to the environment. These numerical regulations relate to the quality of the water in the ground, not the quality of applied or discharged water.

Reclaimed treated wastewater, industrial wastewater, and surface water that is land-applied for irrigation cannot be allowed to degrade local ground water quality below the limitation values. A ground water discharge plan (GWDP) must be submitted to the

NMED describing the quality of the water to be applied, BMPs to be implemented, and the quality of ground waters in the project area. NMED determines if the local ground water may be vulnerable to contamination by the proposed discharge, and may place procedural or numerical limitations on the water being applied.

The City's *North I-25 Reuse Corridor Groundwater Discharge Permit Application* (CH2M Hill, 1998c) to the NMED includes such a plan in support of an application for a ground water discharge permit. The draft plan currently is currently being reviewed by the New Mexico Environment Department.

The City adopted the Ground Water Protection Policy and Action Plan (GPPAP) to protect the ground water resources within the City service area and Bernalillo County. The goal of the plan is to maintain the ground water quality at or above the drinking water standards. The GPPAP also mandates that no discharge to ground water be allowed within 200 feet of a municipal supply well.

The GPPAP identified action levels at which appropriate measures are taken, such as increased frequency of ground water quality monitoring. The action levels are reached when ground water monitoring shows concentrations of constituents of concern are either:

- Present at 50 percent of the primary drinking water standards; or
- Present at 100 percent of the secondary drinking water standards.

If either of these action levels were reached, the City would take the steps necessary to prevent ground water constituent concentrations from exceeding 50 percent of the primary standards or 100 percent of the secondary standards.

3.5.2 Environmental Consequences

The following conditions would be considered resource changes substantial enough to lead to a potential resource effect.

- The reuse of wastewater in combination with diverting surface water would reduce the flow in the Rio Grande, by reducing the volume of the City's wastewater treatment plant discharge, and removing water directly from the Rio Grande, to a point that beneficial uses (as regulated under New Mexico law) of the river are impaired.
- The reuse of the wastewater effluent as reclaimed water would change the water quality of wastewater released from the City's discharge to the Rio Grande to conditions that would exceed permitted limits.
- The use of the reclaimed water for turf irrigation would degrade existing ground water quality.
- The removal of Rio Grande surface water would reduce the water quality of the river itself.

- Implementation of the Proposed Action would affect the operation of MRGCD facilities.
- Implementation of the Proposed Action would affect access to water rights in the Middle Rio Grande.

The anticipated effects of the Proposed Action are summarized in Table 3.5-1.

3.5.2.1 Ground Water

The primary purpose of the Proposed Action is to replace current ground water withdrawal demands on the deep aquifer with a source of non-potable surface water. It is estimated that with current conditions about 3,038 ac-ft/yr. and 2,455 ac-ft/yr. of ground water are being withdrawn from the north and south service areas, respectively (a total of 5,493 ac-ft/yr. for both service areas). Water pumped from the deep aquifer is partially recharged by surface water from the Rio Grande (U.S. Geological Survey, 1995). Studies by the USGS and others indicate approximately 50 percent aquifer recharge per volume of ground water pumped (CH2M Hill, 1998b). The other 50 percent of the pumped water results in net aquifer drawdown. It is estimated that there would be a net aquifer depletion (or drawdown) of approximately 2,750 ac-ft/yr. occurring under the proposed present park and open space irrigation practices. Figure 6 Shows potential future water level declines in the Albuquerque metropolitan area.

The proposed reclaimed water projects would reduce the water demand on the deep aquifer for turf irrigation and compatible industrial uses, a benefit of the Proposed Action. On a net basis the Proposed Action would reduce net ground water depletion by 2,750 ac-ft/yr. for an estimated savings of about 137,500 ac-ft. over the life of the project. Some of these savings would be used as emergency supplies during drought conditions.

The City's GPPAP restricts the discharge of water to land within 200 feet of municipal supply wells. The majority of the irrigation sites are outside of the 200 foot protective buffer. There are small portions of two sites on the Southside project that fall within 200 feet of a supply well. These locations would be xeriscaped or an alternate potable water supply provided.

**TABLE 3.5-1
SUMMARY OF ANTICIPATED EFFECTS TO WATER**

Evaluation Criterion	Alternative	
	Proposed Action	No Action
1. Maximum percent net reduction of flow in the Rio Grande during monthly low flow period as a result of using reclaimed wastewater for turf irrigation and other uses.	0.6	0
2. Percent net reduction in annual average volume from the City's wastewater treatment plant discharged to the Rio Grande	3.8	0
3. Total net quantity of ground water permanently removed from ground water aquifer for non-potable use (acre-feet per year).	0	5,493
4. Number of existing surface water and ground water uses that would be impaired by using reclaimed water.	0	0
5. Number of water quality parameters exceeding State ground water concentration standards.	0	0
6. Percent reduction in riverside drain flows affected by project operation.	0	0
7. Number of water rights holders in the Middle Rio Grande whose access to water or water use activities are restricted by project construction and operation.	0	0
8. Total quantity of wastewater requiring treatment at City wastewater treatment facility ac-ft/yr.	2,455	2,525
9. Percent reduction in overbank flooding potential.	0	0

a/ Combined monthly turf irrigation and industrial use reclaimed water volume (CH2M Hill, 1998b, 1999).

b/ Net water used for reclaimed water project that is not returned to the river (CH2M Hill, 1998b).

c/ Rio Grande at Albuquerque, 1943-1998 (estimated from CH2M Hill, 1997b; Figure C-8).

d/ ac-ft/mo = acre-feet per month. cfs = cubic feet per second.

3.5.2.2 Surface Water

The use of San Juan-Chama water and treated wastewater for the Proposed Action as a replacement for ground water would have three types of effects compared to existing conditions and conditions in the future with the No Action alternative.

First, the Rio Grande would realize an increase in flow averaging about 1,700 ac-ft/yr. or 2.4 cfs from Abiquiu Reservoir, downstream to the proposed Alameda Bridge subsurface diversion point. This is a total distance of about 163 miles. Second, the existing river flow regime between the proposed subsurface diversion point and the existing SWRP discharge point (distance of about 15 miles) would remain unchanged. Third, there would be a net decrease in total river flow between the SWRP discharge point and the Isleta Diversion Dam of about 1,434 ac-ft/yr. or about 2.0 cfs. This reach of river is about 15 miles. The details and reasons for these changes are described in the following paragraphs.

The Proposed Action would result in the City using an average of about 1,700 ac-ft/yr. (or 2.4 cfs, on average) of its San Juan-Chama allocation, primarily for turf irrigation at

City parks, golf courses, and other open space locations in north Albuquerque. A series of demand-return flow analyses coupled with a modified USGS-MODFLOW ground water model of the Albuquerque Basin aquifer (CH2M HILL, in progress, 2000) were used to estimate the quantity of San Juan-Chama water necessary for release in any given year over a 40-year period. The estimated amount of San Juan-Chama water to be released by the City should vary from about 2,800 ac-ft/yr. in early years of the project to about 1,250 ac-ft/yr. in later years (e.g., 2041). The amount of water would generally decrease through time because of the hydrologic linkages between river flows and aquifer recharge. With the Proposed Action, the rate and quantity of aquifer drawdown would both decrease, which would reduce the depletion of river flow needed to offset the aquifer demand.

The Proposed Action would reduce the amount of water pumped from the local aquifer and it would reduce the amount of water infiltrating from the river to the aquifer. The reduced infiltration would occur because the rate of aquifer drawdown would be decreased. To counter the river effects of the Proposed Action, the City proposes to release an average of 1,700 ac-ft/yr. of San Juan-Chama water so there is no net decrease in the amount of existing river water between the subsurface diversion point (relative to the No Action alternative) and the City's wastewater return flow point below Rio Bravo. Downstream of Rio Bravo, there would be a potential decrease (less than 4 percent relative to No Action) in the wastewater discharges to the river. Potential growth of population within Albuquerque may reduce this percentage. The subsequent analysis assumed an average of 1,700 ac-ft/yr. of San Juan-Chama water would be released.

During the Proposed Action, 1.0 million ac-ft/yr. (river flows after the closure of Cochiti Dam, as measured at Albuquerque) plus 1,700 ac-ft/yr. of San Juan-Chama water would flow from Abiquiu Reservoir to the Alameda diversion facility (the Non-potable Surface Water Reclamation portion of the project). At the Angostura Diversion Dam, approximately 170,000 ac-ft/yr. is diverted for irrigation by the MRGCD. After this diversion, approximately 831,700 ac-ft/yr. flows within the river. The Jemez River contributes approximately 45,000 ac-ft/yr. at its confluence with the Rio Grande. The 1,700 ac-ft/yr. of San Juan-Chama water would be removed by the facility at this point to meet irrigation and industrial demand within the Northeast Heights area of the Proposed Action. An approximate amount of 875,00 ac-ft/yr. (as an average) then flows down river to the SWRP. At the SWRP the average amount of treated and discharged water is about 62,500 ac-ft/yr. The Proposed Action would reduce flows from the Southside Water Reclamation Plant Reuse Project outfall by an average of 1,434 ac-ft/yr. (see Figures 9 and 10). The remaining amount of water in the river (936,066 ac-ft/yr.), after the addition of water from the Southside Water Reclamation Plant Reuse Project and the diversion of 1,434 ac-ft/yr. for the Proposed Action would then flow to the Isleta Diversion Dam, which is the south terminus of the project evaluation area. Figure 8 is simplified, and does not account for other, non-project diversions from the river. It does demonstrate the relative locations and amounts of water required by the Proposed Action compared to current and average flow amounts.

The releases of San Juan-Chama water in any given year would be based on the demands actually experienced and a monitoring/accounting scheme to be implemented as part of a river diversion permit from the New Mexico State Engineer. The timing of releases would also consider environmental concerns subject to the State Engineer permit.

The Proposed Action would reduce the amount of water initially pumped from the aquifer and, thereby, reduce the amount of infiltration from the river. The Proposed Action would also decrease the total amount of water treated and discharged back to the river. The net effect of the Proposed Action on flows in the Rio Grande is a reduction of flow below through a combination of reduced ground water pumping, reduced infiltration from the river to the aquifer, and a reduction in treatment plant return flows back to the river.

**TABLE 3.5-2
EFFECT ON RIO GRANDE FLOWS FROM IMPLEMENTATION OF THE
PROPOSED ACTION**

Month	Total Average Project Non-potable Demand ^{a/}		Net Reduction in River Flow ^{b/}		Monthly Average Flows – Rio Grande at Albuquerque	Reduction in Monthly Average Flow Due to Water Not Returned
	(cfs) ^{d/}	(ac-ft/mo) ^{d/}	(cfs)	(ac-ft/mo)	(cfs) ^{c/}	(percent)
January	0.0	0.0	0.0	0.0	791	0.00
February	0.4	24	0.1	7	950	0.01
March	2.8	170	0.8	50	1,039	0.08
April	6.9	418	1.9	115	1,724	0.11
May	12.4	747	3.2	194	2,924	0.11
June	17.8	1,077	4.5	272	2,459	0.18
July	18.8	1,137	4.8	287	1,114	0.43
August	15.4	927	3.9	237	715	0.55
September	9.9	598	2.6	158	439	0.60 greatest effect
October	4.9	298	1.4	86	380 lowest flow	0.38
November	1.6	97	0.5	29	947	0.05
December	0.0	0	0.0	0	916	0.00
Annual total		5,493		1,434		0.17

a/ Combined monthly turf irrigation and industrial use reclaimed water volume (CH2M Hill, 1998b, 1999).

b/ Net water used for reclaimed water project that is not returned to the river (CH2M Hill, 1998b).

c/ Rio Grande at Albuquerque, 1943-1998 (estimated from CH2M Hill, 1997b; Figure C-8).

d/ ac-ft/mo = acre-feet per month. cfs = cubic feet per second.

The use of reclaimed water for irrigation, instead of discharging the effluent to the City's wastewater treatment plant, would result in less water being discharged to the Rio Grande compared to current practices. Table 3.5-2 details the effect on river flow volumes of implementing the Proposed Action. As indicated in Table 3.5-2, over the life of the project the average reduction in river flows (below the wastewater outfall near Rio Bravo) resulting from the proposed project would be 0.17 percent (or about 2.0 cfs), with a maximum within-year flow reduction of 0.60 percent (or 2.6 cfs) in September. The maximum reduction in mean monthly flow (in early years of the Proposed Action) would average 0.25 percent, with a maximum flow reduction of less than 1 percent in September. Figure 9 illustrates river conditions pre and post projects. Figure 10 shows how the net annual effect of the Proposed Action on river flows (relative to the No Action alterna-

tive) will vary over the 40-year period 2002 to 2041. During this interval, the City would expect more population growth, increases in total water use, and more wastewater treatment plant discharge. The effect in 2002 will be an annual decrease in flows of about 2,200 ac-ft (again, 0.25 percent of annual average), whereas in 2041 the effect will be a flow reduction of about 1,040 ac-ft (or about 0.12 percent of annual average). Thus, while the overall demand for reclaimed water and the resulting effects on river flows would vary seasonally (and annually over the life of the project) there would still be a net decrease in river flow. The No Action alternative would result in none of the potential effects to water associated with the Proposed Action. Existing negative effects of aquifer pumping (declining water levels, increased pumping costs and possible ground subsidence) would continue and would become more severe as pumping continued. The positive benefit of reducing the use of basin ground water would not be realized. Net effects upon the river from the No Action alternative are shown in Figure 11. Over time, an increasing amount of river water, as measured by ac-ft/yr., would be removed from the river due to infiltration, effects of ground water pumping and other users without the Proposed Action. A comparison of the Proposed Action with the No Action alternative for the river downstream of the SWRP discharge point is shown by Figure 12.

The No Action alternative after modeling, as depicted within Figure 11, shows no recovery or increase in future river flows. The modeling does indicate some recovery of flows after the Proposed Action, which is a positive benefit due to the reduction in ground water pumping. The No Action alternative would also see a longer stretch of river with depletions because there would be no off-setting flows from the addition of San Juan-Chama water. The additional amount of San Juan-Chama water (average amount of 1,700 ac-ft/yr.) during the time frame of the Proposed Action, would provide a small amount of supplemental river flow from the river stretch between Abiquiu Reservoir and the proposed diversion facility.

Figure 9 Mean Monthly flows in the Rio Grande Before and After the Project.



Figure 10 Decrease in River Flows Caused by Proposed Action Relative to the No Action Alternative

Figure 11 No Action Alternative Net Effects on the Rio Grande



Figure 12 Comparison of Future Net Surface Flow Reductions in the Rio Grande with the No Action and the Proposed Action Alternatives Downstream of the Wastewater Return Point

3.5.2.3 Water Quality

Effects of the Proposed Action on water quality would vary according to the reach of river under consideration. The river reach from Abiquiu Reservoir to the proposed City diversion point (Subarea A) would not be expected to experience any adverse changes to water quality.

This reach would be receiving approximately 2.4 cfs of additional water because of the project. There are no known water quality problems in this reach that would become more severe with the addition of more water of good quality.

The section of river identified as Subarea B (diversion point to the Southside Water Reclamation Plant) would experience temporary increases in suspended sediments during the period when the subsurface water diversion facility is being constructed in the river bed. The construction period would be timed to coincide with the winter months when river flows are generally low and stable (i.e., not affected by thunderstorms or snow melt). Reduced river flows combined with the use of BMPs, as would be required by the Section 401 certification and Section 404; permits would minimize adverse effects to local and downstream water quality. This section of river is not considered to support a recreationally important sport fishery.

Subarea B would not be expected to experience adverse water quality effects because during the in-river construction phase, temporary settling ponds for turbidity control of construction water prior to discharge to the river would be built. A monitoring plan to measure turbidity levels in the river during construction would be set up. This would help insure that discharges from the pond are no higher than ambient conditions.

With the Proposed Action, effluent discharged from the Southside Water Reclamation Plant would not be anticipated to adversely affect water quality in the river. Because discharged constituents would meet EPA's NPDES discharge requirements and because reduced flow volumes would be small compared to the normal volume of river flow, it is anticipated that no adverse effects would result to aquatic life or to designated beneficial uses.

As shown in Table 3.13-2, the reclaimed surface and wastewater would be of high quality and would meet all primary and all but one secondary drinking water standards. Surface water from the Rio Grande is of good quality and when combined with the reclaimed industry water (Reclamation, 1999) does not exceed drinking water or NMED standards. After secondary treatment, the water reclaimed from the wastewater treatment facility might exceed one secondary drinking water standard (iron).

Table 3.5-3 provides data to compare the quality of water resulting from the Proposed Action to New Mexico ground water standards. As shown in the table, the concentration of fluoride in water from the Southside Water Reclamation Plant Reuse Project potentially could exceed the NMED ground water standard for fluoride. However, this is not considered important for two reasons.

**TABLE 3.5-3
COMPARISON OF RECLAIMED WATER AND
NEW MEXICO GROUND WATER CONCENTRATION STANDARDS**

	Northside Estimated Blended Water Concentra- tion (mg/L) ^{a/}	Southside Estimate Water Concentration (mg/L) ^{b/}	New Mexico Ground Water Concentration Standard (mg/L) ^{c/}
Aluminum	0.06	0.10	5.00
Arsenic	0.006	0.01	0.10
Boron	0.078	0.31	0.75
Barium	0.077	--	1.00
Cadmium	0.001	0.002	0.01
Chloride	13	90	250.00
Cobalt	0.006	0.001	0.05
Chromium	0.002	0.01	0.05
Copper	0.003	0.01	1.00
Fluoride ^{d/}	1.24	1.80	1.60
Iron	0.013	0.80	1.00
Manganese	0.001	0.05	0.20
Nickel	0.002	0.005	0.20
Nitrate (NO ₃ as N)	0.98	7.40	10.00
Lead	0.004	0.005	0.05
Selenium	0.001	0.005	0.05
Silver	0.001	0.002	0.05
Sulfate	94	81	600.00
TDS	306	500	1,000.00
Zinc	0.006	0.035	10

a/ Source: CH2M Hill, 1999a.

b/ Source: CH2M Hill, 1999b

c/ New Mexico, State of, 1997.

d/ Shaded constituents indicate irrigation water exceeding ground water standard limitations.

First, although the fluoride concentration of the Southside water would exceed the numeric ground water standard of 1.60 mg/L, this standard applies to fluoride concentrations in water once it is in the ground, not to the water applied at the surface. The NMED evaluated the potential consequences of applying the recycled water with its current fluoride concentration to turf, and concluded that ground water quality would be adequately protected with implementation of the City's protective measures and monitoring commitments (New Mexico 1997a). Water applied in the irrigation areas would not be the source of the drinking water and therefore would not endanger human health or safety.

Second, elevated concentrations of fluoride would not represent risks to local fish and other aquatic wildlife resources associated with surface waters because these resources are located far from the irrigation areas. Even at full concentration in the recycled water (and not accounting for additional dilution or chemical changes that would occur in the water's movement towards the surface water bodies), the concentrations of these parameters are below the known toxic thresholds for representative freshwater fish and aquatic macroinvertebrates.

On a daily basis, the City wastewater treatment plant receives and treats approximately 55.8 mgd, or 62,504 ac-ft/yr. of wastewater and discharges the effluent to the Rio Grande. The reduction of effluent flow from the treatment plant associated with the Proposed Action (2,455 ac-ft/yr.) represents an average annual reduction of only 3.9 percent of the total volume of water discharged to the Rio Grande. The loss of this small quantity of water would not adversely affect the quality of the water discharged to the river because none of the discharged contaminants exceed or are at levels of concern for protecting aquatic life or meeting other regulated water quality criteria.

The No Action alternative would not result in any of the potential effects to water associated with the Proposed Action. There would be no reduction in return flows to the Rio Grande associated with water reclamation. However, none of the identified benefits to the deep aquifer associated with the replacement of uses of deep aquifer water with non-potable water would be achieved. The long-term effects of not implementing the AWRSI program could be ground subsidence and attendant damage to infrastructure in the City, as well as rendering the aquifer body unable to store adequate quantities of ground water to support future use. The effects of this situation on the socioeconomic structure of the community are addressed in Section 3.11.

3.5.3 Environmental Commitments

3.5.3.1 Environmental Design Features

The following project design features would minimize or eliminate potential effects to water quality and quantity:

- The City would perform periodic sampling of the reclaimed water as defined in the GWDP (CH2M Hill, 1998c) to confirm that the water quality meets NMED application standards and the City's GPPAP. Changes in water application procedures or additional treatment would be made to remain compliant with applicable standards if monitoring indicated potential problems.
- State approval of the GWDP application would be acquired prior to issuing construction permits for the reclaimed water distribution system (GPPAP requirement).
- The City would ensure that the reclaimed water quality will meet the appropriate user requirements for industry, turf irrigation, and other uses (Albuquerque, City of, 1998; CH2M Hill, 1999), on an ongoing basis.
- The City would meter all use of the reclaimed water by all users.

- The City would create, maintain, and update an accounting system that would document the proposed projects' effects on the flow regime of the Rio Grande, and would be updated to include the effects of the City's other planned water reclamation and water supply projects. The accounting system would identify the location(s) and quantity(ies) of water removed from the river, the amount returned to the river, and the amount of water that would be depleted because of water use.
- During installation of the subsurface water diversion facility, the City would require the construction contractor to use appropriate BMPs to minimize and contain the discharge of suspended sediments into the Rio Grande.
- During installation of the subsurface water diversion facility, the City would require the construction contractor to maintain an open channel in the Rio Grande for fish passage around the construction site at all times (channel velocity < 1m/sec).
- Installation of the subsurface water diversion facility would be conducted during the river's low-flow period September through March, in accordance with Section 404 permit special conditions.
- A plan to monitor the turbidity levels in the river during in-river construction will be set up.
- The City may have to provide environmental commitment measures to address Section 401 water quality certification conditions. These measures, if any, will be described once they are identified.
- When developing release schedules for the San Juan-Chama water for the North I-25 Non-potable Service Water Reclamation project, the City commits to working with the Fish and Wildlife Service, Office of the State Engineer, and the Interstate Stream Commission such that releases can be made to benefit the RGSM. However, the City's releases must be consistent with State and federal law and must be approved by the Office of the State Engineer. The City's San Juan-Chama water will be released from storage from Abiquiui reservoir in accordance with the conditions set forth in the approved State Engineers permit. The source of the water is the City's contract with the Secretary of the Interior for San Juan-Chama water from the San Juan-Chama project. The City will be submitting the application for diversion of the City's San Juan-Chama water for this project in January, 2001.

There are no anticipated long-term water quality or quantity effects associated with the Proposed Action that would require mitigation measures. If effects shown in Tables 3.6-1 and 3.6-2 are noted by the monitoring program discussed above, the City would implement the provisions of the NMED and GPPAP remediation measures, as required by State and City policy.

3.6 BIOLOGICAL RESOURCES

The project-related biological resource issues identified during scoping activities are listed in Table 3.1-1. Concerns focused on effects to threatened and endangered species

and their habitats (particularly the Rio Grande silvery minnow and its designated critical habitat), wetlands, riparian area protection and maintenance, and associated wildlife.

3.6.1 Affected Environment

Biological resources of the analysis area consist of the plant, fish, and wildlife resources that are associated with the river channel and riparian areas found along the Rio Chama and the Rio Grande corridors (Subareas A, B, and C) as well as the upland metropolitan areas of the City (Subareas D and E). This category includes wetlands, riparian areas, and endangered and threatened species.

Lists of special-status species for Bernalillo County were obtained from the U.S. Fish and Wildlife Service (USFWS) and the New Mexico Game and Fish Department (NMGFD). Table 3.6-1 presents the federally listed species. State-listed endangered and threatened species are provided in Table 3.6-2.

The list of sensitive plants species from the New Mexico Forestry and Resources Conservation Division (NMFRC 1995) for the county was also reviewed. The Migratory Bird Treaty Act (MBTA), Title 16, Code of Federal regulations, Chapter 7, protects all common wild birds found in the United States except the house sparrow, European starling, feral pigeon, and resident game birds. Resident game birds are managed by the State of New Mexico. The MBTA makes it unlawful for anyone to kill, capture, collect, possess, buy, sell, trade, ship, import, or export any migratory bird, including feathers, parts, nests or eggs. The Rio Grande is a main corridor for migratory birds moving from wintering grounds and vice versa. Many migratory birds such as raptors, warblers and other passerine (songbird) birds use the bosque to nest and raise young. The breeding season for many birds in Albuquerque is from April to August.

The biological issues of concern focused on the status of and potential changes to the endangered Rio Grande silvery minnow (*Hybognathus amarus*), the endangered southwestern willow flycatcher (*Empidonax traillii extimu*), the general preservation of the riparian corridor along the Rio Grande, and maintenance of wildlife associated with the riparian corridor. The Rio Grande from the Cochiti Lake tailwaters downstream to the crossing of the Atchison Topeka and Santa Fe Railroad near San Marcial, New Mexico (64 FR 36274) was designated critical habitat for the Rio Grande silvery minnow by the USFWS on July 6, 1999. This distance of about 163 miles includes the area to be affected by the Proposed Action.

Currently, the silvery minnow occupies less than 5 percent of its historic range and is restricted to the reach from Cochiti Lake to the headwaters of Elephant Butte Reservoir (USFWS, 1999). The Rio Grande silvery minnow is extremely rare in the river reaches designated Subareas A and B. Field sampling activities conducted from November 1999 to February 2000 in the river reach to be affected by installing the proposed instream subsurface water diversion facility did not document the presence of this species in this area. Previous sampling efforts and ongoing surveys conducted by the USFWS near the Alameda Bridge have resulted in very few captures (approximately 10 silvery minnows).

The southwestern willow flycatcher has historically occurred on a sporadic basis along the riparian corridor in the Albuquerque area, but local sightings have not been reported

in recent years. Site reconnaissance surveys conducted in 1999 around the area proposed for the subsurface water diversion facility concluded the willow habitat required for this species' breeding and nesting needs was not present.

Historically, the Rio Grande flowed freely across the floodplain, creating a complex of wooded riparian forest and wetland plant communities known locally as the "bosque." These communities were created by catastrophic and seasonal flooding, a perennial high water table, and periodic drought. Despite major alterations in its hydrology, the Middle Rio Grande still supports one of the most extensive and continuous riparian forests in the

**TABLE 3.6-1
 FEDERALLY LISTED ENDANGERED, THREATENED, AND CANDIDATE
 SPECIES FOR BERNALILLO COUNTY, NEW MEXICO**

Common Name	Scientific Name	Federal Status	Critical Habitat
Black-footed ferret	<i>Mustela nigripes</i>	Endangered	No
American peregrine falcon	<i>Falco peregrinus anatum</i>	Endangered	No
Arctic peregrine falcon	<i>Falco peregrinus tundrius</i>	Endangered, similar appearance	No
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened	No
Mexican spotted owl	<i>Strix occidentalis lucida</i>	Threatened	No
Mountain plover	<i>Charadrius montanus</i>	Candidate	No
Southwestern willow fly-catcher	<i>Empidonax traillii extimus</i>	Endangered	No
Whooping crane	<i>Grus americana</i>	Nonessential experimental	No
Rio Grande silvery minnow	<i>Hybognathus amarus</i>	Endangered	Yes

**TABLE 3.6-2
 STATE-LISTED ENDANGERED AND THREATENED SPECIES
 FOR BERNALILLO COUNTY, NEW MEXICO**

Common Name	Scientific Name	State Status
Rio Grande silvery minnow	<i>Hybognathus amarus</i>	Endangered
Neotropic cormorant	<i>Phalacrocorax brasilianus</i>	Threatened
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened
Common black-hawk	<i>Buteogallus anthracinus anthracinus</i>	Threatened
American peregrine falcon	<i>Falco peregrinus anatum</i>	Threatened
Whooping crane	<i>Grus americana</i>	Endangered
White-eared hummingbird	<i>Hylocharis leucotis borealis</i>	Threatened
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Endangered
Bell's vireo	<i>Vireo bellii</i>	Threatened
Gray vireo	<i>Vireo vicinior</i>	Threatened
Baird's sparrow	<i>Ammodramus bairdii</i>	Threatened
Spotted bat	<i>Euderma maculatum</i>	Threatened
New Mexican jumping mouse	<i>Zapus hudsonius luteus</i>	Threatened

southwest (Whitney, 1999). The bosque is dominated by Rio Grande cottonwoods (*Populus deltoides* ssp. *wislizeni*) and various species of willow (*Salix* spp.) (Durkin et al. 1995). There is evidence that the riparian corridor has been expanding in size and into the old river floodplain with the stabilization and reduced frequency of high flood flows.

Exotic plant species like the Russian olive (*Elaeagnus angustifolia*) and salt cedar (*Tamarix ramosissima*) are expanding throughout riparian areas along the Rio Grande. Changes in flow regimes, sediment loads, and colonization by these exotic woody plants have caused an overall decline in cottonwoods and willows (Howe and Knopf, 1991). The proposed subsurface water diversion facility and pump station would be placed in an opening in the riparian corridor that is located south of the Alameda Boulevard Bridge. There are a few large Rio Grande cottonwoods in and around this proposed site. Coyote willow (*Salix exigua*), Russian olive, salt cedar, and Siberian elm (*Ulmus pumila*) dominate riparian vegetation at the proposed site.

There are no jurisdictional wetlands associated with the riparian area proposed for the siting of the subsurface water diversion facility and pump station nor are there any jurisdictional wetlands associated with any of the proposed pipeline corridors, storage reservoirs, or pump stations to be located in either service area (Subareas D and E).

The uplands of the Non-potable Surface Water Reclamation Project Service Area and the Southside Water Reclamation Plant Reuse Project Service Area are characterized by a diverse mixture of native and introduced horticultural plant species typical of many southwestern metropolitan areas. None of these communities are considered to be of unique or special ecological interest or value. There are small remnant areas of native vegetation along some of the arroyos and undeveloped open spaces.

Native vegetation was observed east of I-25 and south of University Boulevard, near Tijeras Arroyo. Plants in this areas include shrubs such as Mormon tea (*Ephedra* sp.), sand sagebrush (*Artemisia filifolia*) and fourwing saltbush (*Atriplex canescens*) and grasses such as sand dropseed (*Sporobolus cryptandrus*), giant dropseed (*Sporobolus giganteus*), spike dropseed (*Sporobolus contractus*), blue and black grama (*Bouteloua gracilis* and *B. eriopoda*), and Indian ricegrass (*Oryzopsis hymenoides*). No trees were noted in this area.

The small sizes of naturally-vegetated areas, high degree of habitat fragmentation, and intense disturbance in the surroundings strongly indicate these areas are unlikely to be of high importance, except to wildlife species that are commonly associated with man.

Except for the proposed site of the subsurface water diversion facility, the proposed development sites are located in uplands areas located in existing light industrial areas, near existing residential areas, or in existing public works facility sites. All of these sites have already experienced site modifications to accommodate past development.

River bars that occur along the margins of the active channel itself typically support young wetland vegetation that is subject to varying stream flows, ground water fluctuations and shifting sediment load. These river bars provide habitat for nesting ducks and geese and other wading birds. The river bars located in the project area, south of Alameda Bridge, are dominated by young coyote willow (*Salix exigua*) and the exotic Rus-

sian olive (*Elaeagnus angustifolia*). Two river bars could be affected by the in-river construction activities. One is located just south of Alameda Bridge and the other island is located about 1,600 feet south of Alameda Bridge.

3.6.2 Environmental Consequences

The following conditions would be considered resource changes substantial enough to lead to potential adverse biological resource effects.

- Loss or substantial degradation of supporting habitat.
- Loss of individual members of a population of a federally-listed threatened, endangered, or proposed species.
- Loss of designated critical habitat for a federally-listed threatened or endangered species.
- Loss or substantial degradation of jurisdictional wetlands.

The anticipated effects of the Proposed Action and its alternative are summarized in Table 3.6-3.

**TABLE 3.6-3
 SUMMARY OF ANTICIPATED EFFECTS TO BIOLOGICAL RESOURCES**

Evaluation Criterion	Alternative	
	Proposed Action	No Action
1. Total number of federal-listed species that are potentially affected.	2	0
2. Total number of federal-listed species that are adversely affected.	0	0
3. Total number of State-listed species that are potentially affected.	2	0
4. Total number of State-listed species that are adversely affected.	0	0
5. Total number of designated critical habitat areas that are adversely affected.	0	0
6. Total acres of designated critical habitat degraded or lost.	0	0
7. Total volume (acre-feet/year) of downstream flow depletion that may affect designated critical habitat for Rio Grande silvery minnow.	1,434	0
8. Reduction in Rio Grande water depth (feet) in the Albuquerque reach after project is implemented, at severe monthly low flow of 200 cfs.	0.02	0
9. Total acres of potential southwestern willow flycatcher habitat permanently lost as a result of project construction or operation.	1	0
10. Total number of jurisdictional wetland areas adversely affected by construction.	0	0
11. Number of known raptor nest sites lost because of construction.	0	0
12. Number of known bald eagle nest sites lost or disturbed because of construction.	0	0

Evaluation Criterion	Alternative	
	Proposed Action	No Action
tion.		
13. Acres of potential bald eagle forage area lost or disturbed because of construction during in river, temporary.	8	0
14. Number of acres of wildlife habitat permanently lost to construction.	1	0
15. Acres of jurisdictional herbaceous wetlands that would be lost due to ground water elevation drawdown of 1.5 feet or more below the existing average ground water depth for a period of at least one month during the growing season.	0	0
16. Acres of jurisdictional herbaceous wetlands that would experience substantial changes in overall community plant structural composition resulting from a ground water decline of 1 foot or more for at least one month due to ground water elevation drawdown	0	0
17. Acres of jurisdictional woody wetlands that would be lost due to ground water elevation drawdown of 3 feet or more below the existing average ground water depth for a period of at least one month during the growing season.	0	0
18. Acres of jurisdictional woody wetlands that would experience substantial changes in overall plant structural composition resulting from a ground water elevation drawdown of 1–3 feet for at least one month due to ground water elevation drawdown.	0	0
19. Acres of non-jurisdictional herbaceous wetlands that would be lost due to ground water elevation drawdown of 1.5 feet or more below the existing average ground water depth for at least one month during the growing season.	0	0
20. Acres of non-jurisdictional herbaceous wetlands that would experience substantial changes in overall plant structural composition resulting from a ground water elevation drawdown of 1 foot or more below the existing average ground water depth for at least one month during the growing season.	0	0
21. Acres of riparian areas that would be lost due to ground water elevation drawdown of more than 3 feet below the existing average ground water depth for at least one month during the growing season.	0.4	0
22. Acres of riparian areas that would experience substantial changes in overall community plant structural composition resulting from a ground water decline of 1 to 3 feet for at least one month.	7.2	0
23. Number of jurisdictional herbaceous wetlands that would be lost due to ground water elevation drawdown of 1.5 feet or more below the existing average ground water depth for a period of at least one month during the growing season.	0	0
24. Number of jurisdictional herbaceous wetlands that would experience substantial changes in overall community plant structural composition resulting from a ground water decline of 1 foot or more for at least one month due to ground water elevation drawdown.	0	0
25. Number of jurisdictional woody wetlands that would be lost due to ground water elevation drawdown of 3 feet or more below the existing average ground water depth for a period of at least one month during the growing sea-	0	0

Evaluation Criterion	Alternative	
	Proposed Action	No Action
son.		
26. Number of jurisdictional woody wetlands that would experience substantial changes in overall plant structural composition resulting from a ground water elevation drawdown of 1 to 3 feet for at least one month due to ground water elevation drawdown	0	0
27. Number of non-jurisdictional herbaceous wetlands that would be lost due to ground water elevation drawdown of 1.5 feet or more below the existing average ground water depth for at least month during the growing season.	0	0
28. Number of non-jurisdictional herbaceous wetlands that would experience substantial changes in overall plant structural composition resulting from a ground water elevation drawdown of 1 foot or more below the existing average ground water depth for at least one month during the growing season	0	0
29. Number of riparian areas that would be lost due to ground water elevation drawdown of more than 3 feet below the existing average ground water depth for at least one month during the growing season	1	0
30. Number of riparian areas that would experience substantial changes in overall community plant structural composition resulting from a ground water decline of 1 to 3 feet for at least one month.	1	0

The Proposed Action would have a mixed set of consequences on biological resources, particularly those identified as being of concern for this action. Effects would vary by type of resource and by subarea. Because all the upland construction and maintenance activities would occur in residential, light industrial, commercial, and urbanized parks and open spaces, effects to upland biological resources would be considered minor and would require no further analysis. None of the biological resource effects in these areas would be considered major or important. There were no significant, unusual, or unique plant or wildlife resources identified in any of these areas that would be affected by any of the proposed construction and development activities.

The following potential resource consequences are organized by major topic. Potential effects to these topics are directly or indirectly linked to changes in either water supply or to changes in the existing river hydrologic regime. Discussions are organized in decreasing order of perceived regulatory and public interests.

3.6.2.1 Threatened and Endangered Species

The environmental effects of releasing and conveying 2.4 cfs (1,700 ac-ft/yr.) from Abiquiu Reservoir to the proposed subsurface water diversion facility and then diverting it into a collecting system near the Alameda Bridge would have mixed results depending on the subarea and threatened and endangered species of concern.

There would be no adverse or beneficial effects to threatened and endangered species that are indirectly linked to river flows and the hydrologic regime through changes in riparian habitat. There is the potential for an invasion of salt cedar or other non-native

parian habitat. There is the potential for an invasion of salt cedar or other non-native plants in the area that may be affected by a lowering of the ground water table directly under and near the cassion structure in the bosque just south of Alameda Boulevard (about 0.4 acres). The seasonal and annual river hydrographs above the proposed water intake point (Subarea A) would remain essentially unchanged because of the conveyance of additional San Juan-Chama water allocation. Average monthly water releases from Abiquiu Reservoir and from Cochiti Lake without the 2.4 cfs of additional San Juan-Chama water were 678 cfs (40,298 ac-ft/mo.) and 1,908 cfs (113,324 ac-ft/mo.), respectively (based on 1993 information).

A slight increase in flow quantity (about 2.4 cfs) would be created in Subarea A, there would be no change in flow between the diversion structure and the Southside Water Reclamation Plant outfall (Subarea B), and there would be slight decrease in flow (about 2.0 cfs) from the Southside Water Reclamation Plant outfall resulting from the use of 1,434 ac-ft/yr. for turf irrigation and industrial uses (Subarea C). Both of these changes occurring in Subareas A and C are small compared to the background flows of the river as recorded at the Albuquerque gage. The most severe decrease resulting from the reduction in return flow (1,434 ac-ft/yr.) would amount to approximately 0.60 percent of the monthly average flow during September (Table 3.5-2).

The Proposed Action would not be responsible for completely dewatering any portion of the existing river channel or reach from Abiquiu Reservoir to the Isleta Diversion Dam. River flow conditions downstream of this diversion structure are largely controlled by diversion and water management decisions of others.

Comparisons of adding and deleting 2.4 cfs to and from water surface elevations with the existing river channel at different points along the affected river reaches indicated that changes in the water stage (i.e., the height of the water surface) would vary by 0.02 feet under the most severe of conditions (CH2M Hill, 1999).

This small elevation fluctuation in surface water in the channel would translate to a more dampened fluctuation in floodplain ground water elevations. The small elevational change would not affect stream velocity or depth, two important aquatic habitat variables. Riparian and wetland systems and habitats associated with the ground water elevations of the floodplain would remain unaffected by the project flow changes. The maintenance and welfare of these systems are controlled in part by depth to ground water characteristics, as is noted in the biological evaluation criteria. Such small elevation variations would be similar to many seasonal events that are well within the range of natural variation that occurs annually and seasonally along the river. Without a hydrologic trigger large enough to force a change in riparian vegetation conditions, there would be no reason to suspect that riparian-habitat associated species, such as the bald eagle and southwestern willow flycatcher, would be affected by flow alterations of the magnitude associated with the Proposed Action.

Construction of the proposed subsurface water diversion facility and the pump station in the Rio Grande channel and floodplain would not affect known habitat for the southwestern willow flycatcher or bald eagle. Construction would temporarily affect up to 8 acres of river channel that has been designated as critical habitat for the Rio Grande silvery minnow. Approximately 4/5 of the channel would be separated from the main chan-

nel during construction by a temporary barrier that would allow installation of the buried infiltration screens and pipelines. After construction and installation were completed, the temporary dam and earthworks would be removed. The channel banks and bottom shapes and grades would be restored to pre-construction conditions. Construction in the river channel would occur during the low-flow months (September through March) and could be completed in one construction session. USFWS salvage personnel would be present to capture and relocate any Rio Grande silvery minnows that might become trapped during the construction of the coffer dam or other water barrier around the construction area.

Diversion of the City's San Juan-Chama Water (1,700 ac-ft/yr.) and the reduction in return flow from the Southside Water Reclamation Plant (1,434 ac-ft/yr.) would not result in an adverse effect to the Rio Grande silvery minnow or its critical habitat. There are two reasons for this conclusion. First, based on recent sampling and previous sampling activities, the Rio Grande silvery minnow is extremely rare in the area of the proposed diversion and Southside Water Reclamation Plant outfall. June and July 2000 monitoring indicated two minnows from 490 seine hauls within the reach. Second, the amount of water to be added and then diverted (Subarea A) and return flow depleted (Subarea C) would be considered a small, if even noticeable change, in a river system that typically experiences large fluctuations in flows. For example, total river flows measured at the Albuquerque gage since 1971 (when the San Juan-Chama project began delivery) have ranged from a minimum of about 244,300 ac-ft/yr. in 1977 to a maximum of about 1,841,800 ac-ft/yr. in 1986. The average annual flow from 1971 to 1998 was about 1,019,200 ac-ft/yr. (Albuquerque, City of, 1999.)

It is anticipated that there would be no permanent, adverse changes to designated critical habitat for the Rio Grande silvery minnow because of the Proposed Action. This conclusion is based on the following: 1) After the installation of subsurface collection pipes in the river, the riverbed contours will be restored to the extent possible, 2) the disturbed river channel will re-adjust naturally following high flow events, and 3) a flow depletion of 2.0 cfs represents only an anticipated reduction of return flows at the SWWP (Subarea C) of 0.60 percent of September low flows, (Table 3.5-2).

Slight increases in channel flow would be created between Abiquiu Reservoir and Dam and the proposed City diversion point. Moderate increases or decreases in channel flow, of the levels anticipated for the proposed project, in the vicinity of the proposed project area, are not likely to affect the Rio Grande silvery minnow or its recovery. No portion of the Albuquerque reach of the Rio Grande has suffered "discontinuous flow" or "river drying" as defined by previous authors (Dudley and Platania 1999). These authors define these two terms as

'The terms "discontinuous flow" and "river drying" are used frequently in this report and are meant to represent discrete stages in the continuum between a flowing river and a dry river bed. Discontinuous flow refers to a river reach of indeterminate length which retains some standing water but no longer maintains measurable flow. Initially, a discontinuous reach will consist of one single pool that dissipates to become a series of smaller isolated pools. The term "river drying" is applied when water no longer re-

mains in a relatively extensive portion of the river, as opposed to the dry reach between isolated pools.”

Given the 0.02 feet change in surface water elevation in the river, with respect to depth and velocity in the Albuquerque reach, more or less water in the amounts associated with this project may have a neutral effect. Consistently low capture rates for Rio Grande silvery minnow in this reach confound a clear understanding of the nature of the relationship between Rio Grande silvery minnow, flows, distribution of velocity habitat and distribution of depth habitat.

With no credible opportunity for loss of continuous river flows in the Albuquerque reach because of this project, the issue of depletion (an average of 0.17 percent reduction in monthly average flow due to water not returned, and a worst case low flow reduction of 0.6 percent in September) in this reach becomes moot. The maximum change in surface water elevation attributable to the Proposed Action, 0.02 feet, does not have a quantifiable effect upon velocity or depth aquatic habitat parameters. Dismissal of potential impacts to the Rio Grande silvery minnow from flow depletion in the Albuquerque reach does not address flow depletions, discontinuous flow or river drying in reaches below Isleta Diversion Dam or San Acacia Diversion Dam. The proposed Action will release 2 cfs less from the wastewater treatment plant to the river. This quantity would not be measurable in the river system. Even considering the combined effects of the Northside Reclamation Project and the Southside Water Recycling Project, a combined potential depletion of the river of 1,434 ac-ft/yr., it is not apparent that a measurable effect will exist at Isleta Diversion Dam or below the dam for a substantial distance. The reduction of treated wastewater effluent to the Rio Grande would have no impact on the quality of the effluent that is released to the river. The water that would be diverted for the Southside Water Reclamation Plant Project is diverted at the end of the treatment process (or just before it is discharged into the Rio Grande). The water discharged from the outfall meets all Federal (NPDES Permit No. NM0022250), State and Tribal (Pueblo of Isleta) standards. These standards are protective of aquatic life and therefore, protective of the Rio Grande silvery minnow (RGSM). The reduction in treated water would not likely affect, the quality of the water in to the river, and thus will not adversely affect RGSM.

A temporary disruption of 8 acres of riverbed at the subsurface diversion would occur during low flow months (September through March). Although Rio Grande silvery minnow have been documented in the general vicinity of this site in 1994 through 1997 plans to salvage any stranded fish and coordination of in-river disturbances with USFWS personnel should avert any adverse effects to the silvery minnow. Completed releases of RGSM in the Angostura Reach of the Middle Rio Grande include in June and July 2000 release of approximately 80,000 larval and post larval individuals. Monitoring results reported for June and July 2000 reflected the collection of two minnows from the Angostura Reach where the proposed diversion facility is located.

3.6.2.2 Wetlands and Riparian Areas

Field investigations completed to date in areas proposed for construction or fill activities have not identified the presence of jurisdictional wetlands that would be regulated by

Section 404 of the Clean Water Act. Therefore, the Proposed Action would not have any adverse effects to this resource.

Installing the subsurface water diversion facility in the Rio Grande riverbed would require Corps of Engineers authorization through the provisions of several Nationwide Permits (NWP). Discussions completed to date suggest that NWPs (Nationwide Permits) 12 and 33 would be required to authorize construction in this regulated waters of the United States.

The construction of the subsurface water diversion facility, associated pump station, access road, and any ancillary facilities would require the direct removal of about 1.0 acre of existing riparian area to support project facilities. The proposed facility would be located in an existing woodland opening to minimize the removal of mature cottonwoods. The lost riparian trees (native species only) and area would be replaced at a 3 to 1 ratio (Albuquerque, City of, 1993). An agreement currently is being negotiated within the City departments that would be involved in changing the site's use.

Another 4 to 5 acres would be altered temporarily during construction. Riparian vegetation could be reestablished on this 4 to 5-acre area after the pump station, road, and subsurface water diversion facility were constructed.

From a long-term perspective, it is anticipated that operation of the surface water diversion facility would lead to long-term effects to the riparian area that lies under the cone of ground water depression that would be created once the subsurface water diversion facility begins withdrawing ground water. Ground water hydrologic analyses suggest that a cone of ground water depression would be created in the existing floodplain around the diversion system that would affect a total area of about 11 acres. About 0.4 acres of this area would experience a ground water depression of 3 feet or more, which would suggest permanent loss of cottonwoods, willows, and other woody species with similar root depths (could lead to the aggressive invasion of salt cedar). About 7.2 acres would experience a ground water depression of 1 to 3 feet, which could lead to a shift in species composition to riparian or upland species that would be more tolerant of drier soil conditions. It would be anticipated that the woodland would remain in place, but the long-term species composition would change. The 1 acre of riparian area lost to direct construction effects would probably overlap with all or most of the riparian zone that would be indirectly affected by ground water drawdown.

For the reasons that were described above in Section 3.6.2.1 and with exception of the riparian area located above the cone of ground water depression, it is anticipated that the small increases and decreases in river flows that would be associated with the proposed action, would not have an effect on the continued maintenance, survival, and reproductive potential of the riparian corridors associated with the Rio Grande in Subareas A, B, and C.

3.6.2.3 Riparian Wildlife

Except for the riparian area that would be affected by constructing and operating the subsurface water diversion facility and the associated pump station, the Proposed Action would not adversely or beneficially affect wildlife species that are commonly associated

with the riparian corridor. This conclusion is based on the findings that it would be unlikely that riparian vegetation would change because of the small anticipated alterations in river channel hydrology and water quantities.

At the subsurface water diversion facility and pump station complex, as much as 11 acres of riparian woodland complex could be altered through a combination of direct and indirect project construction and operation effects. The final effects would depend on many environmental variables that would not be determined until operations began. An Endangered Species Act (ESA) informal Section 7 consultation is being conducted with the USFWS regarding the potential effects of implementing the water reclamation project on the Rio Grande silvery minnow and its designated critical habitat, the bald eagle and Southwestern willow flycatcher (Appendix G). A Fish and Wildlife Coordination Act Report was completed and is included as Appendix H.

The No Action alternative would not affect threatened and endangered species, wetlands, or riparian areas because no site alterations or flow depletions would occur with this alternative.

3.6.3 Environmental Commitments

3.6.3.1 Environmental Design Features

The following project design features would minimize or eliminate potential adverse project effects to biological resources:

- Project pipeline alignments have been routed primarily in developed public rights-of-way to minimize activity in undisturbed areas.
- Project facilities to be located in the riparian corridor would be sited and sized to minimize the unnecessary loss of cottonwoods and other native vegetation.
- During construction in the river, any fish stranded by construction of the coffer dam will be salvaged and relocated to a different portion of the river. An agreement with U.S. Fish and Wildlife Service (USFWS) staff will be available to permit USFWS personnel to move individual specimens of the Rio Grande silvery minnow, if this species inadvertently becomes separated from the main river channel by construction activities.
- During installation of the subsurface water diversion facility, the City would require the construction contractor to use appropriate BMPs to minimize and contain the discharge of suspended sediments into the Rio Grande.
- During installation of the subsurface water diversion facility, the City would require the construction contractor to maintain an open channel (velocity less than 1 meter/ sec) in the Rio Grande for fish passage around the construction site at all times.
- Installation of the subsurface water diversion facility would be conducted during the river's winter low-flow period of September through March to avoid to the ex-

tent possible the spring snow melt and summer monsoons seasons of high flows in the river and in accordance with Section 404 permit special conditions.

- In the year 2000 the City would provide \$50,000 to the Albuquerque Aquarium for construction, staffing and monitoring for Rio Grande silvery minnow egg-holding and rearing facilities – to raise eggs to the young-of-the year stage before the fish are released to upstream transplant locations upstream of the San Acacia diversion dam.
- The City will revegetate and enhance the bosque in the area affected by the construction and other areas as determined by the Open Space Division. In addition, the City will participate in a joint project with other local, state and federal agencies to be modeled after the Albuquerque Overbank project. The total funding to be committed for these projects is estimated at \$60,000.
- The City will provide the Fish and Wildlife Service with an annual report detailing the progress of mitigation activities.

3.6.3.2 Mitigation Measures

With implementation of the listed design features, no substantial adverse effects to biological resources in the immediate project area are anticipated from the Proposed Action. There are no anticipated long-term adverse operation effects likely to jeopardize the continued existence of the Rio Grande silvery minnow that would require compensation measures.

As a result of the informal ESA Section 7 consultation, compensation measures recommended to minimize potential effects of the proposed project to the Rio Grande silvery minnow would include the following:

- In year 2000, the City will provide the USFWS with \$33,500 for the collection and transportation of Rio Grande silvery minnows and \$17,000 for sampling and monitoring surveys.
- The City will implement all mitigation measures resulting from Reclamation's Section 7 consultation with the USFWS.
- The City will restore the bosque and Rio Grande in the area affected by the construction of the project to the original condition or better. During development of the technical plans and specifications for restoration of the Rio Grande channel, the City will coordinate with the Corps of Engineers, Fish and Wildlife Service and Interstate Stream Commission to design a channel section that could provide of potential habitat for the Rio Grande silvery minnow. If permits and approvals cannot be obtained to construct the channel in that manner, the City will construct the channel to match the existing section as approved.
- Temporary materials and equipment stockpile areas at the subsurface water diversion facility construction area would be reclaimed and revegetated with suitable woody trees and shrubs.

3.7 AESTHETICS/VISUAL RESOURCES

The project-related aesthetics and visual resources environmental issues identified during scoping are listed in Table 3.1-1. Concerns focused on the visibility of new project structural facilities and water storage reservoirs or tanks from residential and public use areas.

3.7.1 Affected Environment

Aesthetics and visual resources include the presence and appearance of manmade features, landforms, water surfaces, and vegetation relative to the surroundings and settings of the area. These features are the primary characteristics of an area or project that determine visual character and the manner in which people view the setting. Existing visual character in the project evaluation area consists of two distinctly different settings.

- The riparian corridor, defined by the river channel and its associated floodplain, is dominated by a complex of tall cottonwood trees that either create a continuous tree band along the river or it is intermixed with openings and clumps or small areas of willows, salt cedar, and Russian olive shrubs and small trees. The riparian corridor is undeveloped, with much of it being used as recreation land or open space in the metropolitan area and for agricultural and recreation purposes outside the City.
- The second setting includes the complex of City residential, commercial, open-space, and light-industrial areas that collectively define the developed portions of the north and south service areas. This setting is characterized as a mixture of many different structural forms and views that change from one location to another. Within this setting there are a number of existing aboveground water storage tanks, pump stations, and other water transmission facilities that have been developed over many years of water supply development.

3.7.2 Environmental Consequences

The following conditions would be considered resource changes substantial enough to lead to a potential resource effect.

- Location and size of project facilities that would block most of an existing viewshed.

Two reservoirs and four pump stations would be constructed for the Non-potable Surface Water Reclamation Project. A 9.3-mgd diversion pump station with accompanying access road would be located in an opening within the bosque just south of Alameda Boulevard Bridge on the east bank of the Rio Grande. This facility would be visible from the recreational hiking and biking trail along the river and Riverside drain. The facility would be a conspicuous new structural addition to the existing local riparian landscape. The actual subsurface system would not be visible because it would be buried beneath the river channel and the floodplain.

This structural addition would not be considered an important visual effect because views on the east side of the trail look into residential and commercial facilities. The

general visual setting of the area conditions viewers to scenes of buildings and other structures at many places along the corridor.

The first transmission pump station would be located at the developed Coronado site that contains existing reservoirs and other water resource equipment. The 5.55-mgd pump station would blend into the existing visual character of the setting. The station would be located across Paloma Avenue, just north of Edmund G. Ross Elementary and Hope Christian School.

A new reservoir with an associated 3.46-mgd pump station, would be located near the Arroyo Del Oso soccer fields. The 0.6-MG-capacity reservoir would be 22 feet high and 70 feet in diameter. The reservoir and pump station would be sited approximately 400 feet north of Spain Road and 300 feet west of Wyoming Boulevard.

A combined facility consisting of a 1.1-MG-capacity reservoir and a 1.89-mgd pump station would be located at the east edge of El Oso Grande Park and west of Juan Tabo Boulevard. The reservoir would be partially buried and the pump station would be screened to mask their presence in a residential neighborhood.

A new 1.9-MG reservoir for storing reclaimed water would be added to the Southside Water Reclamation Plant Reuse Project service area. The proposed reservoir would be sited on City-owned property located immediately east of the Puerto Del Sol golf course (corner of Thaxton Avenue and Wellesley Drive). This area is used primarily for multi-unit residential purposes, so the reservoir would be required to meet the City Public Works Department facility planning requirements. To reduce its visual profile, the concrete reservoir would be buried or partially buried so that no more than 12 feet of the reservoir would be exposed above grade.

Two new pump stations would be required for the Southside Water Reclamation Plant Reuse Project. The first would be located at the Southside Water Reclamation Plant, and the second would be located next to the new 1.9-MG reservoir.

Except for the Alameda Boulevard/Rio Grande constructed wetland open space, there are no open space areas, as listed by the City, that are adjacent to reservoirs or pump stations. The Alameda Boulevard/Rio Grande constructed wetland open space, located east of the diversion facility area, would be physically separated from the open space by a levee that would form a visual barrier between the two areas. This location would be the closest open space area to any project structure.

The anticipated effects of the Proposed Action and the No Action alternative are summarized in Table 3.7-1. The reservoir and associated pumping station for the Non-potable Surface Water Reclamation Project that would be located near Wyoming and Osuna would be visible from Arroyo del Oso Golf Course and Arroyo del Oso Park. The pump station associated with the reservoir that would be located at the east edge of El Oso Grande Park would be visible from the park and from portions of the Joseph Montoya campus of the Albuquerque Technical Vocational Institute. There are approximately 50 households within a 0.25-mile radius of the reservoirs. The reservoir site for the Southside Water Reclamation Plant Reuse Project, located east of the Puerto del Sol Golf Course, would be partially visible from the golf course.

With the implementation of the environmental design features discussed below, no substantial temporary, long-term, or cumulative adverse effects to aesthetics or visual resources would be expected from the Proposed Action. With the No Action alternative, facilities would not be constructed and no effects to aesthetics and visual resources would occur.

**TABLE 3.7-1
 SUMMARY OF ANTICIPATED EFFECTS TO
 AESTHETICS AND VISUAL RESOURCES**

Evaluation Criterion	Alternative	
	Proposed Action	No Action
1. Approximate number of households within 0.25-mile radius of a reservoir that would have an unobstructed view of a new structure.	50	0
2. Number of public use areas (parks) within 0.25 miles that would provide an unobstructed view of a new structure.	3	0
3. Approximate percent of tank perimeter within 10 feet of ground's surface that would not be screened by vegetation or barrier treatments.	0	0
4. Approximate percent of tank perimeter within 10 feet of ground's surface that would allow unrestricted access and potential for vandalism.	0	0
5. Number of facilities that would be located in a sensitive viewshed or viewing area	0	0
6. Number of facilities that would be visually dominant to the average viewer.	1	0
7. Number of facilities that would have visual aspects that would consistently draw the eye from the surroundings.	1	0

3.7.3 Environmental Commitments

3.7.3.1 Environmental Design Features

The following project design features would minimize or eliminate potential project effects to aesthetics and visual resources:

- Reservoir siting and site preparation will minimize vertical intrusion by incorporating lowered elevation (tank base set below surrounding grade were possible) landscaping or blending the base of the tank with existing ground level site contours.
- Appropriate landscaping and interposed wall structures, consistent with site access and security, will minimize visual effects and prevent vandalism and graffiti. The Public Works Department will coordinate the on-site requirements for construction of project facilities with local and adjacent neighborhood associations.
- Appropriate reservoir and wall structure patterns and colors will be used to minimize visual intrusion. The City will work with the local residential neighborhood associations to determine appropriate patterns.
- Appropriate site access limitations and maintenance activities will be implemented to prevent vandalism and graffiti and to ensure continued visual minimization.

- Appropriate landscaping and interposed wall structures, consistent with site access and security, will minimize visual effects.

The same measures would be applied at all reservoir and pump station locations.

3.8 TRAFFIC AND CIRCULATION

The project-related traffic and circulation environmental issues identified during scoping activities are listed in Table 3.1-1. Effects of construction activities on traffic and locations of buried pipelines in neighborhood streets were identified concerns.

3.8.1 Affected Environment

Pipeline corridors for this project would traverse both two-lane and four-lane roads. Distances, in linear feet, for both road types are given in Table 3.8-1. In addition, several intersection crossings would be required. Pipeline locations relative to City streets are shown in Figures 5 and 6.

Major four-lane streets in the Non-potable Surface Water Reclamation Project service area are Alameda, Louisiana, Montgomery, Wyoming, Juan Tabo, and Eubank. Two-lane streets are present primarily in residential areas. The major two-lane residential streets include Palomas, Harper, San Francisco, Chama, the Northside-Pennsylvania-Osuna area, Wilshire-Barstow, Ventura, and the Camaro-Carruthers-Academy Ridge-Lowell area, near Tanoan.

The major four-lane streets in the Southside Water Reclamation Plant Reuse Project service area are Second, Rio Bravo, University, Broadway, Sunport, and for a shorter distance, Yale, San Pedro, and Caesar Chavez. Two-lane streets are present primarily in residential areas. The major two-lane residential streets include Smith along the Puerto del Sol Golf Course, Whittier Park and then Kathryn to Phil Chacon Park, San Jose, and Kathryn between Broadway and Chavez Park.

Road and utility construction is a common activity within the transmission corridor at numerous locations. Locations where construction often occurs include near the airport on University Boulevard and on Paseo del Norte near North I-25.

3.8.2 Environmental Consequences

The following conditions would be considered resource changes substantial enough to lead to potential resource effect.

- Project construction activities cause traffic delays that exceed City requirements.

A summary of the anticipated effects of the proposed project and the No Action alternative are summarized in Table 3.8-1. The specific streets and lengths of streets that would be affected were listed in Tables 2.4-3 and 2.4-4.

**TABLE 3.8-1
 SUMMARY OF ANTICIPATED EFFECTS TO TRAFFIC AND CIRCULATION**

Evaluation Criterion	Alternative	
	Proposed Action	No Action
1. Number of intersection crossings (constructed or bored).	125	0
2. Length of pipeline to be installed in 2-lane streets (linear feet).	81,322	0
3. Length of pipeline to be installed in 4-lane streets (linear feet).	95,466	0
4. Number of street segments where anticipated traffic delays would exceed City requirements	0	0

Installing buried conveyance lines would not be expected to cause major or substantial temporary, long-term, or cumulative adverse effects to traffic. The Proposed Action would not be expected to exceed City traffic management standards because construction contractors are required to comply with City ordinances that are intended to minimize traffic congestion and delays. The following is a list of potential bore and jack locations:

- 1) 4th Street at Alameda Boulevard
- 2) 2nd Street at Alameda Boulevard
- 3) North Diversion Channel at Alameda Boulevard
- 4) Paseo Del Norte at Louisiana Boulevard
- 5) Domingo Baca Arroyo at Louisiana Boulevard
- 6) North Pino Arroyo at Louisiana Boulevard
- 7) Pino Arroyo at Louisiana Boulevard
- 8) Wyoming Boulevard at Bear Canyon Arroyo
- 9) Eubank Boulevard at Bear Canyon Arroyo
- 10) Morris Street at Bear Canyon Arroyo
- 11) Bear Tributary Arroyo Moon Street
- 12) North Pino Arroyo at Ventura Street
- 13) Domingo Baca Arroyo at Barstow Street
- 14) Paseo Del Norte at Barstow Street

The Non-potable Surface Water Reclamation Project service area would experience about 50,455 linear feet of construction in or along four-lane streets. Most of the work in four-lane streets would occur on Alameda, Louisiana, and Wyoming. The non-potable water diversion transmission main would traverse Alameda, heading east to the first reservoir location at Honeywell, and traverse south on Louisiana, from south of Paseo del Norte towards the Arroyo Del Oso Golf Course. The mainline would also go north on Juan Tabo from the reservoir and pump station location at El Oso Grande Park. Eubank would be traversed by a non-potable line from the transmission main between Osuna Park Elementary and El Oso Grande Park.

Approximately 34,700 linear feet of two-lane streets would be traversed. Eight bore and jack locations comprising a total length of 2,100 linear feet would be necessary for the main and smaller lines to be constructed in the area. Pipeline construction in the Non-potable Surface Water Reclamation Project service area would require removal and replacement of 80,650 linear feet of asphalt.

There would be about 45,011 linear feet of construction within or along four-lane streets in the Southside Water Reclamation Plant Reuse Project service area. The water line would traverse Second going north to Bridge and include a portion of Broadway between San Jose and Kathryn. Rio Bravo would be used to carry the water line east from Second to University, and then north toward the airport and the University of New Mexico campus. Pipeline would also be placed along Sunport, a four-lane road that heads east from University to the airport. Yale would be used to carry the line north across Gibson, and approach Caesar Chavez. A four-lane section of San Pedro would be used to place the water line south from Kathryn to Bullhead Memorial Park.

Approximately 46,622 linear feet of two-lane streets would be used for conveyance line construction for the Southside Water Reclamation Plant Reuse Project. Pipeline construction would require about 83,645 feet of asphalt removal and replacement.

Effects to traffic and circulation could include substantial delays or the need for detours or street closings. The potential extent of traffic congestion from construction activities would be related to such factors as the total length of pipeline to be placed in streets (longer pipelines increase the area of disturbance and the potential for traffic congestion), the right-of-way width relative to the roadway width, the need to avoid existing utilities in the right-of-way, and the number and type of intersections crossed.

Construction and installation of pipeline would occur without substantial effects to traffic, provided the standard protective measures stipulated by the City's *Development Process Manual* (Albuquerque, City of, 1997) were implemented. Contractors who work in the City routinely incorporate these protective measures into their standard construction procedures to minimize effects on traffic and delays to commuters. Examples include flexible work-site scheduling, extended work hours, weekend versus weekday construction, and non-peak-hour construction.

Pipeline installation along street rights-of-way would be expected to cause some traffic congestion and slow-down in the following areas during the construction period. However, because the pipeline would be installed at the rate of 400 to 500 feet per day, traffic and circulation effects at any site would be temporary, lasting only 1 or 2 days. None of

these sites would be anticipated to have traffic delays that would exceed City requirements.

- Alameda Boulevard eastbound is a busy thoroughfare during heavy traffic periods. Portions of the pipeline along this route may actually be completed in the right-of-way in order to avoid altering the street.
- Louisiana south of Paseo del Norte is under construction in some areas. Traffic would be heavy during rush hours. Juan Tabo and Montgomery would not be disrupted for a long distance (less than 1 mile) along those two streets.
- Second Street carries considerable traffic during rush hours, as does Broadway. There is ongoing construction along some parts of University Boulevard. Gibson Boulevard would not be disturbed. Yale Boulevard and Sunport Boulevard are entrances to the airport that would be expected to have considerable traffic during most hours of the day.

The environmental design features discussed below would be required by the City for construction projects. With their implementation, no temporary, long-term, or cumulative adverse effects to traffic would be expected for the Proposed Action.

With the No Action alternative, no facilities would be constructed and no temporary construction effects to traffic would occur.

3.8.3 Environmental Commitments

3.8.3.1 Environmental Design Features

The following project design features would minimize or eliminate potential effects to traffic and circulation:

- The pipeline would be routed in existing utility rights-of-way to minimize the length and width of potential interference with traffic.
- The pipeline installation would be bored under several major intersection involving state highway crossings to minimize traffic disruption.
- The construction contractor would be required to meet City requirements for preparing an impedance analysis and traffic/barricade plan, and would be required to implement appropriate work measures to ensure an adequate level of service on affected streets. This could include such actions as flexible work site scheduling, extended work hours, weekend versus weekday construction, and hour non-peak construction.

Environmental design features for control of traffic would be prepared in conjunction with measures for noise control. This approach would help ensure that measures that facilitate traffic, such as work-hour extensions or restrictions, do not produce adverse noise effects, such as nighttime construction noise in residential areas.

3.9 SOILS AND VEGETATION

Soil and vegetation (turf irrigated areas) environmental issues identified during scoping activities are listed in Table 3.1-1. Potential effects of salt buildup in soil and its ability to support vegetation, and effects of residual chlorine on vegetation irrigated with reclaimed water were the main concerns expressed during public scoping.

3.9.1 Affected Environment

Soils in the Non-potable Surface Water Reclamation Project service area are represented by three soil associations. The turf areas proposed for irrigation are located in the Bluepoint-Kokan association (40 percent), Madurez-Wink association (30 percent), and Tijeras-Embudo association (30 percent).

The soils in the Southside Water Reclamation Plant Reuse Project service area are predominantly the Bluepoint-Kokan (60 percent) and Madurez-Wink (40 percent) associations. The Bluepoint-Kokan association includes well-drained sandy and gravelly soils. The Madurez-Wink association consists of well-drained loamy soils.

The soils in the Mesa del Sol area are deep and well-drained, and formed from old, unconsolidated materials deposited by the ancestral Rio Grande. These soils are fine sands, loamy sands, and sandy loams with scattered areas of gravel.

Soils that would be irrigated with reclaimed water are well suited for irrigation, have low salt and sodium content, and are not classified as saline or alkaline soils (Hacker, 1977). Moderate alkalinity is present within most project area soils.

Municipal park areas within the City are typically planted with a mixture of bluegrass, ryegrass, and fescues. Bluegrasses are classified as moderately sensitive to irrigation waters with elevated water salinity (reaction threshold at 3 millimhos per centimeter (mmhos/cm)) and perennial ryegrass and red fescue are classified as moderately tolerant to elevated irrigation waters salinity (reaction threshold approaching 10 mmhos/cm) (U.S. Environmental Protection Agency, 1992).

Generally these soils have electrical conductivity (EC) values of 0.7 to 1.1 mmhos/cm, and sodium adsorption ratio (SAR) values of 0.14 to 0.20 (Hacker, 1977; National Soil Survey Laboratory, 1998).

Large turf grass areas such as parks, golf courses, and athletic fields are currently watered with potable water. This water is treated with chlorine to disinfect it against harmful microorganisms. This treatment leaves a total residual chlorine (TRC) concentration of about 1 milligram per liter (mg/L), which is approximately equivalent to 1 part per million (ppm) in the water.

There are no known water-based chlorine residual problems from the application of the current sources of water to City turf areas. Naturally occurring chlorine residuals may be present in the soils in some areas.

Water applications are managed so water is applied at a rate and volume necessary to maintain turf vigor and avoid salt accumulations in deeper soils. Soil salt accumulation is

a hazard of irrigating turf and crops in arid climates. In temperate areas, frequent precipitation leaches accumulated salts below the plant root zone. However, in arid locations such as Albuquerque, natural precipitation is not sufficient to leach salts. Salts accumulate at shallow soil depths when small quantities of natural precipitation or irrigation water evaporate, leaving trace amounts of dissolved salts in the soil pore space. High salt accumulations in the root zone of turf grass would eventually affect its growth.

Proper turf grass management practices can prevent salt accumulation in the upper soil layers by using water practices that provide just enough leaching water to flush salts below the root zone, while still meeting turf maintenance requirements. These practices are being used by the City to avoid undesirable effects.

Plant species exhibit a wide range of inherent tolerances to the adverse effects of soil salinity, which is the reason that the EPA (1992) standard for irrigation water uses, expressed as total dissolved solids (TDS) ranges from 500 to 2,000 mg/L. Irrigation water with a TDS greater than 500 mg/L and an EC greater than 4 mmhos/cm can represent a growth hazard for sensitive plant species (Salinity Laboratory Staff, 1954). SAR values exceeding 10 to 15 indicate a potential sodium hazard in the soil or irrigation water (Salinity Laboratory Staff, 1954).

Fluoride toxicity to plants is unusual, but can occur in acid soils (pH of 5.5 or lower) when fluoride applications are high. No toxic effects are likely when soil pH is 6.0 or greater (U.S. Environmental Protection Agency, 1992). The soils in the Albuquerque turf areas are basic, with pH values ranging from 7.4 to 8.4. Toxic effects to plants have been reported when fluoride levels of 30 to 300 ppm dry weight were reported in plant tissues (Gough *et al.*, 1979).

Plant sensitivities to TRC (Total Residual Chlorine) are generally considered to be non-harmful below a concentration of 70 mg/L by agronomists (California Fertilizer Association, 1980). A TRC concentration of 350 mg/L or more is considered hazardous to plants (California Fertilizer Association, 1980).

3.9.2 Environmental Consequences

The following conditions would be considered soil changes substantial enough to lead to potential effects on irrigated vegetation. There are no prime or unique farmlands associated with the project evaluation area, so highly-productivity agricultural soils would not be affected.

- The reclaimed water would not be suitable for irrigation and would result in a toxic buildup of salts in the root zone.
- The concentrations of dissolved salts and fluoride in the reclaimed irrigation water would affect plant growth.
- The application of chlorinated non-potable water to turf and other vegetation would adversely affect plant growth.

The anticipated effects of the Proposed Action are summarized in Table 3.9-1. As discussed below, there would be no substantial adverse effects to soils and vegetation from

implementing the Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque.

Non-potable water from the Proposed Action would be treated with enough chlorine disinfectant to achieve the 1 mg/L TRC concentration that is required for potable drinking water. This is the same TRC concentration that is currently being used to irrigate park and open space turf. Therefore, changing the irrigation water source from potable water to non-potable water would have no effect on chlorine concentrations in the water or the effects of chlorine to plants within the irrigated areas.

The buildup of TDS and fluorides in soils from irrigation with non-potable water would not be expected to adversely affect turf vegetation. Natural soil pH is high enough (alkaline) to precipitate small quantities of dissolved fluorides in the water. Fluoride precipitation in the soil would prevent it from adversely affecting plant growth. Soil TDS concentrations would be kept low enough to accommodate plant growth through the implementation of the City's present water management plan. This plan is designed to leach soil salts deeper than 6 to 10 feet below the surface. There are no known open space or recreation areas with existing soil salinity, fluoride, or TRC application problems that would become more severe with the Proposed Action.

Fluoride is the only standard that is exceeded by the reclaimed water from both the Non-potable Surface Water Reclamation Project and the Southside Water Reclamation Plant Reuse Project. After blending, the fluoride concentration average from the Non-potable Surface Water Reclamation Project would be 1.2 mg/L and the fluoride concentration from the effluent from the Southside Water Reclamation Plant Reuse Project would be 1.8 mg/L.

**TABLE 3.9-1
 SUMMARY OF ANTICIPATED SOIL AND VEGETATION
 RESOURCE EFFECTS**

Evaluation Criterion	Alternative	
	Proposed Action	No Action
1. Number of average water quality parameters that exceed EPA water quality standards for irrigation water use.	1 (fluoride)	0
2. Water quality parameters in irrigation water that would have an adverse effect on plant growth.	0	0
3. Acres of land that would not be suitable for irrigation.	0	0
4. Number of plant species that would experience toxic effects resulting from irrigation with the reclaimed water.	0	0

The applicable EPA recommended limit for fluoride is 1.0 mg/L for turf irrigation (U.S. Environmental Protection Agency, 1992). The New Mexico ground water discharge limitation for fluoride is 1.6 mg/L (New Mexico, State of, 1997). This limit was established to protect sensitive plant species in acidic soils.

Fluoride-sensitive plants and acid soil conditions do not exist in the project evaluation area. The calcium that is common in soils in the Albuquerque area inactivates fluoride toxicity to plants. Additionally, the City's water management plan for turf areas will leach fluoride and other salts to a level about 6 feet to 10 feet below the root zone. Therefore, it would be anticipated that fluoride in the non-potable water concentrations would not cause adverse turf effects.

SAR values exceeding 10 to 15 generally indicate a potential sodium hazard in soils or irrigation water (Salinity Laboratory Staff, 1954). The SARs of the reclaimed water (1.69 for the Non-potable Surface Water Reclamation Project and 4.0 for the Southside Water Reclamation Plant Reuse Project) would be well below this range, indicating that detrimental effects from sodium salts would not occur.

There would be no effects to soils and vegetation from implementing the No Action alternative.

3.9.3 Environmental Commitments

3.9.3.1 Environmental Design Features

Potential adverse effects to plant growth from the buildup of soil salts would be controlled by continuing the City's present water management plan, which involves leaching salts out of the upper 6 to 10 feet of the soil profile. Specific water management elements would include the following.

- Guidance from the City regarding irrigation management would be provided to all reclaimed water users.
- The City will monitor monthly the metered use of reclaimed water.

3.10 CULTURAL RESOURCES

The project-related cultural resources environmental issues identified during scoping activities are listed in Table 3.1-1. Because the project would be partially paid for with federal funds, the project planning, construction, and maintenance must comply with the National Historic Preservation Act of 1966, as amended (NHPA). This law and its accompanying regulations outline a process for identifying, evaluating, and mitigating adverse effects of a project on important cultural resources. A Cultural Resources Survey Report (Ecosystem Management, Inc., 2000) was completed.

3.10.1 Affected Environment

A background site records search of the Archaeological Records Management Section (ARMS) of the SHPO found that a number of cultural resources have been previously documented within the project area. Within 500 meters (1,500 feet) of the proposed project site, 24 prehistoric and historic cultural sites have been previously recorded. These sites are listed in Table 3.10-1. Cultural resources inventory of undisturbed segments of the proposed project yielded no new sites. No traditional cultural properties were identified through consultation with the Pueblos of Cochiti, Isleta, Sandia, San Felipe, Santa

Ana, and Santo Domingo, or with the San Jose Parish, or the Nativity of the Blessed Virgin Mary parish on Alameda

Much of the evaluation area is highly disturbed by modern construction and substantial soil removal in the area. This condition does not eliminate the possibility of encountering subsurface cultural deposits. However, the probability of accurately predicting the location of these resources is diminished because the area is disturbed, and archaeologists are less likely to be able to detect subsurface deposits from the surface.

The potentially eligible historic irrigation system, known as the Middle Rio Grande Conservancy District (MRGCD), has widespread distribution. This system is considered to be an important feature because it is "associated with events that have made a significant contribution to the broad patterns of our history" and it has "made a measurable impact on local life" (SWCA, Inc., 1997). The MRGCD irrigation system has been recommended as eligible to be included in the National Register of Historic Places (NRHP) by its age, its historic and engineering significance, and its integrity (SWCA, Inc., 1997). The historic canals have not been assigned Laboratory of Anthropology site numbers (SWCA, Inc., 1997).

**TABLE 3.10-1
PREVIOUSLY-RECORDED CULTURAL RESOURCES SITES
WITHIN 500 METERS OF THE PIPELINE CORRIDOR ^{a/}**

Site Number	Affiliation	Period(s)	Cultural Resource Site Type(s)
LA ^{b/} 421, State Register # HPD 1235	1. Anasazi 2. Puebloan 3. Hispanic 4. Euro-American	1. AD 1100-1550 2. AD 1539-1629 3. AD 1539-1708 4. AD 1904-1998	1. Residential Complex 2. Residential Complex 3. Residential Complex 4. Residential Complex
LA 50240	1. Anasazi 2. Hispanic	1. AD 1100-1325 2. AD 1710-1903	1. Artifact Scatter 2. Artifact Scatter/Features
LA 85052	Euro-American	AD 1912-1945	House Foundation
LA 87058	1. Anasazi 2. Hispanic 3. Hispanic 4. Euro-American	1. AD 1450-1550 2. AD 1625-1680 3. AD 1821-1900 4. AD 1930-1945	1. Artifact Scatter 2. Feature & Artifact Scatter 3. Feature & Artifact Scatter 4. Artifact Scatter
LA 87466	Anasazi	AD 14510-1550	Artifact Scatter
LA 125582 ^{c/}	Not Available	Not Available	Irrigation Ditch
F-35 FN (Alameda Church)	Hispanic	Not Available	Religious Structure
LA 112787	Unknown	Unknown	Lithic Scatter
LA 112788	Unknown	Unknown	Lithic Scatter
LA 112789	Unknown	Unknown	Lithic Scatter
LA 112790	Unknown	Unknown	Lithic Scatter
LA 112791	Unknown	Unknown	Lithic Scatter
LA 112793	Unknown	Unknown	Lithic Scatter
LA 112794	Anasazi	AD 900-1300	Artifact Scatter and Features
LA 112795	Anasazi	AD 1-1300	Artifact Scatter and Features
LA 112796	Anasazi	AD 1-1600	Artifact Scatter

LA 112797	Anasazi	AD 500-1300	Artifact Scatter
LA 112798	Unknown	Unknown	Lithic Scatter
LA 112799	Unknown	9500 BC to AD1800	Artifact scatter
LA 112800	1. Anasazi 2. Anasazi	1. AD 1050 to 1275 2. AD 1300 to 1600	Artifact scatter
LA 112901	Anglo-American	AD 1941-1999	Railroad Track/Bed
LA 118060	Anglo-American	AD 1941-1999	Railroad Track/Bed
LA 69519	Unknown	Unknown	Lithic and FCR Scatter
San Jose Church	Hispanic	Undetermined	Religious Structure/ Cemetery

^{a/} Source: State of New Mexico, Historic Preservation Division records.

^{b/} Acronyms and abbreviations:

AD *anno domini*

LA Laboratory of Anthropology, New Mexico Historic Preservation Division

^{c/} LA 125582 has been recently surveyed and located, but site data have not yet been published.

Although most of the original irrigation system features have been remodeled, removed, or destroyed during reconstruction and paving of the flood control and irrigation system, the system as a whole retains its historic importance.

3.10.2 Environmental Consequences

The following conditions would be considered resource changes substantial enough to lead to potential resource effect.

- A prehistoric or historic cultural resource (including the MRGCD irrigation system) would be adversely affected if a potentially eligible site or human remains were disturbed or destroyed without completion of an approved data recovery program or without concluding the process outlined in the Native American Graves and Repatriation Act when Native American remains are discovered, if applicable.

The MRGCD and Reclamation both maintain records on the existing irrigation system, which can be compared with development plans to determine the specific effects of the Proposed Action on the irrigation system. The anticipated effects of the Proposed Action are summarized in Table 3.10-2. The primary factor affecting anticipated effects to cultural resources would be the length of the construction disturbance required for the distribution system. A longer route would have a proportionately greater potential to disturb cultural resources.

Neither the Proposed Action nor the No Action alternative would directly affect any of the previously-recorded sites listed in Table 3.10-1. However, construction activities could encounter subsurface resources that are not visible from the present-day ground surface or could affect portions of the historic irrigation canals. The proportion of undisturbed ground surface that would be disturbed by construction of both the Non-potable Surface Water Reclamation Project and the Southside Water Reclamation Plant Reuse Project would be approximately 12 percent of the total project area. The historic acequias that are crossed by the projects will have less than 1 percent of their total respective areas affected by the proposed Action. Also, no water control devices associated with the acequias will be affected by the Proposed Action.

The proposed conveyance routes would not cross any known sites previously registered with ARMS. If a proposed conveyance route would cross a feature related to the MRGCD irrigation system, its characteristics would be recorded according to guidelines issued by SHPO on January 5, 1999 (SHPO, 1999). The locations that would be crossed in the project area are as follows: Alameda Interior Drain; Alameda Lateral; Albuquerque Main Canal; Albuquerque Riverside Drain; Barelás Irrigation Feature; Barr Main Canal; Chamisal Irrigation Feature; Chamisal Lateral, and the San Jose Interior Drain. These acequias would be restored to their present condition if any disturbance to them occurs during the construction of the non-potable water distribution routes.

The No Action alternative would not cause any adverse effects to cultural resources because no facilities would be constructed.

**TABLE 3.10-2
 SUMMARY OF ANTICIPATED EFFECTS TO CULTURAL RESOURCES**

Evaluation Criterion	Alternative	
	Proposed Action	No Action
1. Total length of undisturbed ground surface with the potential for subsurface cultural resources that could be disturbed by construction (linear feet).	24, 190	0
2. Number of potentially-eligible cultural resources sites or traditional cultural properties likely to be affected by project construction and operation.	0	0
3. Total length of distribution system route that would be disturbed by construction (linear feet)	200,978	0

3.10.3 Environmental Commitments

3.10.3.1 Environmental Design Features

The following project design features would minimize or eliminate potential project effects to the known or undiscovered cultural resources described in the previous section:

- Before ground-disturbing construction work takes place, a meeting would be conducted to inform construction crews of the potential for disturbing subsurface cultural resources and of the required procedures should a site be encountered. This briefing information would become especially important upon encountering human remains.
- A cultural resources discovery plan has been prepared as part of the cultural resources inventory report. The plan has been approved by Reclamation and will be submitted to the SHPO for their approval prior to the beginning of construction. The plan would outline procedures for protecting newly-discovered cultural resources, evaluating their importance, and avoiding or mitigating the project's ad-

verse effects. The plan would also detail procedures for complying with the Native American Graves Protection and Repatriation Act (NAGPRA), in case human remains are discovered.

- A cultural resources discovery plan will be prepared and finalized through consultation with Reclamation and the New Mexico State Historic Preservation Office (SHPO), prior to the beginning of construction. The plan will outline procedures for protecting newly discovered cultural resources, evaluating their importance, and avoiding or mitigating any adverse effects from the project. The plan will include procedures for complying with the Native American Graves Protection and Repatriation Act (NAGPRA), in case human remains are discovered.
- Any cultural resources found during construction will be documented and evaluated as to their national Register eligibility. Reclamation will consult with the SHPO regarding the eligibility of these sites. Any eligible sites or eligible portions of the non-potable water distribution system either will be avoided by realigning the project, or a data recovery plan approved by Reclamation and the SHPO will be implemented to mitigate potentially adverse effects.

3.10.3.2 Mitigation Measures

Important cultural resources affected by the project would be either avoided by relocating structures or by documenting the feature using an approved recovery plan process. Along with project realignment, avoidance may include temporary fencing and archaeological monitoring of construction in the vicinity of important resources. Data recovery may include mapping, photography, surface collection, excavation, and historic document research.

Mitigation measures that are recommended to avoid or minimize adverse effects include the following:

- Precautions would be taken to ensure qualified archaeological assistance would be immediately available in case of a discovery. The discovery plan approved by Reclamation and SHPO would outline these precautions in detail. Work at the site would cease if cultural resources were unearthed during construction activities. The archaeologist would either be present during portions of the non-potable water pipeline construction or be available to respond to a telephone call from the site to evaluate the unearthed materials and to ensure that any uncovered cultural resources were appropriately recorded or avoided, based on the discovery plan referenced above. Work at the site would resume after such recording or avoidance was completed.
- Historic acequias that are crossed by the proposed non-potable water distribution routes will have less than 1 percent of their total respective areas affected. These acequias would be restored to their present condition if any disturbance to them occurs during the construction of the non-potable water distribution routes.
- A pedestrian survey and cultural resources documentation has been conducted prior to construction in those sections of the proposed project area that have undis-

turbed ground surface. An undisturbed ground surface is defined as a landscape surface without extensive human-caused modification. No cultural resources were found during this survey. All previously recorded sites would be avoided by re-aligning the project. The inventory phase of the project also identified specific MRGCD facilities that would be affected by the project. The small portions of the irrigation system laterals that would be affected by construction would be rebuilt to their pre-construction condition. Reclamation would consult with SHPO regarding the results of cultural resources identification and avoidance efforts as documented in the cultural resources report.

- A final design report will be submitted to the SHPO.

Implementing these measures would avoid and reduce construction effects. There are no anticipated long-term operation effects to cultural resources that would require mitigation measures.

3.11 SOCIOECONOMIC FACTORS

Project-related socioeconomic issues identified during scoping are listed in Table 3.1-1. This socioeconomic assessment identifies major social and economic benefits and costs of the Proposed Action construction and operation. Bernalillo County and the subareas were identified as the analysis area because most socioeconomic effects would be expected to occur in that area. Primary concerns focused on the project's effects on increasing water bills for the average City resident, how the City's diversion of its water would affect water diversions by other entities, who will pay for the cost of the project, and changes in construction and permanent employment as a result of project construction and operation.

3.11.1 Affected Environment

In 1997, Bernalillo County had a per capita income of \$24,478, which was substantially higher than the statewide average. During the 1990s, county per capita income grew approximately 5 percent per year (Bureau of Economic Analysis, 1997). The unemployment rate in 1998 was 4.4 percent and county household income was \$34,714 (Schan, 1999).

Total county employment in 1998 was 305,676 individuals. Employment by sector was greatest for services, government and wholesale-retail trade. Approximately one-third of all employed individuals in that year worked in a service-related position. The largest employers in the Albuquerque area (Albuquerque Economic Development, Inc., 1999) are public schools (10,600 employees), the University of New Mexico (14,401 employees), Kirtland Air Force Base (8,967 individuals), and the City (9,000 persons). In 1998, there were 19,329 construction jobs in the county (BBER, 1998). Surplus capacity exists for all public services, including police and fire protection, health care, education, and water and wastewater treatment facilities.

The AWRMS was adopted by the City Council on April 24, 1997. The total estimated cost for the AWRMS was estimated at \$180 million. Water reclamation and reuse projects were estimated to cost \$32.4 million, or about 18.0 percent of this total.

Funding for the AWRMS is coming from a series of dedicated City of Albuquerque water rate increases that will be implemented over a 7-year period. The City has planned a series of small water rate increases because they are easier to implement, compared to a single large increase. The City administration and the City Council must authorize the rate increases each year.

The first rate increase of 4.7 percent went into effect on May 1, 1998. The second increase (also 4.7 percent) went into effect on May 1, 1999. The third proposed rate increase is scheduled for May 1, 2000. The proposed method for funding the AWRMS includes cash, bonds, federal cost-sharing grants, and contributions from private industry. Because rate increases are staged, the effect on an annual basis would be relatively small.

3.11.2 Environmental Consequences

The following conditions would represent substantial changes to social and economic characteristics of the analysis area.

- Rate increases for implementation of the proposed project that are an economic hardship for City water customers.
- Businesses are forced to close or relocate as a result of project construction.

The anticipated effects of the Proposed Action are summarized in Table 3.11-1. The gain in temporary and permanent employment with the Proposed Action is apparent, while the change in additional water rates is either no different from the No Action or a small increase with the Proposed Action.

Total project capital cost for the Non-potable Surface Water Reclamation Project was estimated as \$23.1 million dollars (in 1999 dollars), which would be about 11.8 percent of the total AWRSI cost. The total Southside Water Reclamation Plant Reuse project would cost about \$12.0 million dollars, which would be about 6.7 percent of the total AWRSI cost (in 1999 dollars). Collectively, the Proposed Action (which includes both projects) would cost about \$35.1 million dollars (CH2M Hill, 1999b and 1999c). This funding would come from several sources, including Reclamation Title XVI program funding for up to 25 percent of the total construction cost. Additional funding would come from the City and from private sources. Much of this money would be spent within the local economy, which would benefit many different wholesale and retail businesses.

Potential environmental consequences would be associated with facility construction and operation and payment for the projects through water rate increases. Construction effects would include both beneficial and negative consequences. Beneficial effects would be associated with local purchases of material, equipment and supplies and the effects of additional worker salaries and income. Minor negative effects could be associated with disruption to some businesses during construction and with population in-migration as some construction workers temporarily move to the area. It is estimated that only about 20 percent of all construction workers (about 50 workers on-peak) would temporarily move to the area from outside Bernalillo County. This conclusion was based on the large number of construction workers already residing or working in the county.

Increased local construction worker salaries would be a benefit. Based on labor force requirements for constructing water storage reservoirs, pump stations, treatment facilities, more than 30 miles of pipeline, and other project facilities, it was estimated that the construction worker peak could be approximately 250 individuals (CH2M Hill, 2000). Construction would take around two years. Workers would consist of engineers, electricians, carpenters, concrete workers, heavy equipment operators and laborers. Most workers would probably be hired from the local area. Assuming an average construction worker salary of \$20 per hour, would translate into a local benefit of approximately \$8 to \$10 million in worker salaries. Worker salaries would be re-spent locally, generating additional regional income through county businesses as jobs grew and personal income increased.

**TABLE 3.11-1
SUMMARY OF ANTICIPATED EFFECTS TO SOCIOECONOMIC
CONDITIONS**

Evaluation Criterion	Alternative	
	Proposed Action	No Action
1. Cost of additional rate increase to fund this specific project (dollars per month per household)	\$2.14	\$2.14
2. Number of businesses or commercial operations along the pipeline route that would require relocation or closing.	0	0
3. Total number of permanent new jobs lost because of the project.	-10 ^{a/}	0
4. Total number of temporary or seasonal new jobs lost because of the project.	-250 ^{a/}	0
5. Average number of construction jobs lost during the period of construction	-100 ^{a/}	0
6. Amount of rate increase as a percentage of the average monthly household income for County residents.	<0.1	0
7. Amount of rate increase as a percentage of the average 1998 monthly water bill for County residents	<0.1	0

a/ A negative loss is the same effect as a gain. This convention was used to allow equivalent comparison with other evaluation criteria that track adverse changes. The larger the negative number, the greater the benefit or gain.

Because only 50 or so workers are expected to temporarily move to the area for construction jobs, effects on public services and infrastructure would likely be unnoticeable. No additional police officers, firemen, doctors or teachers would be required as a result of project implementation and the existing housing supply would easily accommodate this small population increase.

The water distribution pipelines may cross some properties; however, no businesses will be forced to close or relocate because pipeline construction would generally take place within existing utility rights-of-way.

The effects of project operation would be positive and would create 6 to 10 long-term jobs to operate and maintain the facilities. These employees would probably be hired from within Bernalillo County. The City would train some qualified applicants to operate or maintain the reuse/recycling facilities.

Proposed project costs would be repaid by increased water rates. In 1998, the average monthly household water bill was \$31.83, lower than other major cities in New Mexico. This rate was about one-third of Santa Fe's water charge and about two-thirds of the average water bill from other water providers in the Greater Albuquerque area (CH2M Hill, 1997). The overall AWRSI-related cost increases in monthly water bills would be ex-

pected to be about 36 percent, which would be implemented over a seven-year period. This would raise the average existing monthly water bill by \$11.58, to \$43.41.

Based on the average increase in monthly water bills of \$11.58, the cost attributed to the Proposed Action would be \$2.14 per month. Individual project monthly water charges would be \$1.37 (Non-potable Surface Water Reclamation Project) and \$0.77 (Southside Water Reclamation Plant Reuse Project). Implementing this cost over 7 years would produce an average increase of approximately \$0.31 per month each year. The increase in the monthly water bills for county residents would therefore be less than 0.1 percent compared to current monthly water bills and less than 0.1 percent of average monthly household income. For this analysis, it was assumed that water rate increases would be significant if the monthly increase exceeded either 10 percent of the current average monthly water bill or 1 percent of the average annual household income. Therefore, the potential effect of higher water rates would not be an adverse economic effect.

With the No Action alternative, water diversion, storage, pumping, and distribution facilities would not be constructed so none of the social and economic effects related to project implementation would occur. However, the No Action alternative would have potentially long-term adverse consequences because it would not address the objectives of reducing the City's reliance on decreasing supplies of potable ground water and creating a ground water drought reserve.

Economic and social costs of the No Action alternative would be associated with continued ground water depletion, subsequent water shortages, and possible economic costs associated with land subsidence and damages to infrastructure. In addition to these costs, a No Action strategy could eventually have an economic effect on the City, as some businesses could decide to relocate to other areas. These costs have not been estimated. The indirect costs of the No Action alternative could ultimately exceed the development costs of the Proposed Action. These indirect costs would typically be reflected as higher property taxes and increased cost of living (Table 3.11-1).

There would be no anticipated changes in existing economic and social characteristics outside the county.

3.11.3 Environmental Commitments

The following project design features would minimize potential project effects to socioeconomic conditions.

- Use existing road and utility rights-of-way as much as possible to reduce permitting and land acquisitions cost and to reduce disruptions to commercial facilities.
- Hire local construction personnel to build the projects.
- Hire and train local professional or service personnel to operate and maintain facilities so direct and secondary spending remains in the local economy.

3.12 NOISE AND VIBRATION

Project-related noise and vibration concerns identified during scoping activities are listed in Table 3.1-1. Effects of construction and operation activities on nearby residents and effects of treatment plant pump noises during operations at the Southside treatment plant were identified as concerns.

3.12.1 Affected Environment

The existing noise conditions of the Proposed Action area fall into two categories. The first category includes undeveloped open space and recreation area that typically experience relative low-level ambient noise backgrounds. The second category includes developed residential, commercial, light-industrial, and transportation corridors commonly found throughout the City limits. These types of settings experience a wide range of noises because of the different uses and activities that are conducted. The second category experiences higher ambient background noise levels than the first category.

The streets and roads proposed as routes for buried conveyance pipelines already experience construction noises from many different types of activities, including road repaving, road repair, and utility line installations and repairs.

Background noise levels tend to be relatively lower in residential and open-space areas (such as parks, the river corridor, and golf courses) than along four-lane streets and in business and commercial areas.

3.12.2 Environmental Consequences

The following conditions would be considered environmental changes substantial enough to lead to potential noise and vibration effects.

- Noise and vibration from construction activities from the project exceeds City noise standards.
- Long-term, chronic noise from the pump stations or other operating equipment exceeds City noise standards.

The anticipated noise and vibration effects of the Proposed Action are summarized in Table 3.12-1. The Proposed Action would not be expected to exceed existing City noise standards.

Noise from construction activities would be expected for a short time during construction of the non-potable water system pipeline, pump stations, subsurface water diversion facilities, and storage reservoirs. The pipeline would pass through residential, industrial, and school areas. Schools and residential areas are considered more sensitive to noise than industrial, roadway, and business areas because ambient noise levels are lower.

Residential areas along pipeline routes would experience increased noise levels. Residential areas along the transmission main that would experience temporary noise increases from the Non-potable Surface Water Reclamation Project would include neighborhoods associated with Alameda Boulevard, Rio Grande Boulevard, Louisiana

Boulevard, Arroyo Del Oso Park to El Oso Grande Park, Juan Tabo Boulevard to the Tanoan neighborhood, Jade Park, Presbyterian Hospital grounds, La Cueva High School, Heritage Hills Park area, and south of Albuquerque Academy.

Residential areas along the transmission conveyance route for the Southside Water Reclamation Plant Reuse Project would include neighborhoods near San Jose Park, Kathryn Avenue near Chavez Park, Smith Avenue, Whittier Park and Kathryn Avenue to Phil Chacon Park. This area is entirely residential.

Construction and installation of pipelines, pump stations, and storage reservoirs are activities that would occur without substantial effects to ambient noise levels provided that the standard protective measures stipulated by the City's *Development Process Manual* (Albuquerque, City of, 1997) and Noise Ordinance (ACC Albuquerque City Code) §6-22; Albuquerque, City of, 1981) were complied with. Protective measures are routinely incorporated into standard construction procedures to minimize noise from construction activities. In general, environmental controls for noise would be directed at limiting the noise profile of construction equipment by specifying control practices to be implemented by the construction contractor in residential areas. The City conducts periodic noise testing at construction sites and contractors would be required by their contract with the City to conform to the requirements of ACC §6-22. As a general rule of practice, the City also restricts construction working hours within 500 feet of residential areas and sensitive receptors (R. Mitzelfelt, City of Albuquerque Environmental Health Department, personal communication).

**TABLE 3.12-1
 SUMMARY OF ANTICIPATED EFFECTS TO NOISE AND VIBRATION**

Evaluation Criterion	Alternative	
	Proposed Action	No Action
1. Length of pipeline to be installed in streets within 500 feet of residences (linear feet).	61,135	0
2. Number of expected cases when construction activities would exceed City vibration standards.	0	0
3. Number of expected cases when operation activities would exceed City vibration standards.	0	0
4. Number of expected cases when construction activities would exceed City noise standards.	0	0
5. Number of expected cases when operation activities would exceed City noise standards.	0	0

The City has no noise standards for activities in commercial or industrial areas other than conforming with ACC §6-22.

Because the pipeline would be installed at the rate of 400 to 500 feet per day, noise and vibration effects at any site would be temporary, lasting only 1 or 2 days. Pipeline segments located in or along residential streets would potentially result in greater noise

perceptions by more people than the same activities being conducted in undeveloped, open land.

Any potential for pump station noise would be addressed through the City Code §6-22 Article 9-9-7 (A) that applies to the operation of machinery, equipment, fans and air conditioners (Albuquerque, City of, 1981). Within the area of the pump stations, noise cannot exceed 50 decibels (dB(A)) or 10dB(A) above the ambient noise level, whichever is greater, when measured at a residential property line.

Construction noises associated with installing the subsurface water diversion facility in the river and the adjacent bosque could create nuisance noises to riparian corridor users during periods of construction. Any noise may temporarily displace some wildlife from the area. This area is uninhabited and does not possess any sensitive human noise receptors. New construction noise would be noticeable to open-space users as they passed through the area along the nearby trail, but the intensity and duration of the noise would be temporary and would not be considered harmful.

The environmental design features discussed below are required by the City for construction projects. When these features are implemented, no temporary, long-term, or cumulative adverse effects from noise levels would be expected from the Proposed Action.

The proposed activity does not include vibration-causing activities that would affect the integrity of structures. Therefore, no problems with vibration from project construction or operation would be expected.

With the No Action alternative, facilities would not be constructed so none of the temporary construction or long-term operation noise and vibration effects would occur.

3.12.3 Environmental Commitments

3.12.3.1 Environmental Design Features

The following project design features would be required by the City for construction projects. Compliance with these measures would be required to obtain City construction permits. These features, when implemented, would minimize or eliminate potential adverse effects from noise and vibration:

- The construction contractor would have to meet the noise ordinance requirements of the City (ACC § 6-22) for noise control on construction equipment.
- The contractor would adhere to project work hour restrictions (work allowed only between 7 a.m. to 10 p.m.) within 500 feet of residences and hospitals.
- The contractor would arrange the construction schedule to restrict the number of days in a work location within 500 feet of the same residence, hospital, school, church or library to four days.

- Any potential operational noise from pump stations, reservoirs, or related facilities will adhere to City ordinance requirements (ACC § 6-22, Albuquerque, City of, 1981).

Environmental design features for control of noise would be prepared in conjunction with measures for traffic, in order to avoid potential cumulative effects of traffic control measures and noise-producing activities, and noise control measures and project effects on traffic (i.e., work hour extensions or restrictions).

3.13 HUMAN HEALTH AND SAFETY

Project-related human health and safety environmental concerns identified during scoping activities are listed in Table 3.1-1. The primary concern included potential health risks associated with accidentally cross-connecting the non-potable and potable water distribution lines.

3.13.1 Affected Environment

The present water distribution system of pipelines and other water conveyance facilities uses color-coding to separate potable from non-potable water distribution lines. Users of the reclaimed water generated were detailed in Section 2, Proposed Action and Alternatives. Locations of these users were shown on Figures 2 and 3.

3.13.2 Environmental Consequences

The following conditions would be considered changes in existing human health substantial enough to lead to potential adverse effects.

- Cross-connection of potable and non-potable water distribution lines such that people were directly exposed to reclaimed water.
- Exposure to reclaimed water that resulted in direct effects to human health.

Anticipated effects of the Proposed Action are summarized in Table 3.13-1. There would be no temporary, long-term, or cumulative adverse effects to human health and safety from either the Proposed Action or the No Action alternative.

As added safety measures the potential public health effects of accidentally cross-connecting non-potable water used for irrigation into the drinking water system, or exposing people to irrigation water when it was in use for turf irrigation were evaluated. The evaluation was conducted by comparing the quality of reclaimed water for irrigation with quality requirements for drinking water.

**TABLE 3.13-1
 SUMMARY OF ANTICIPATED EFFECTS TO HUMAN HEALTH AND SAFETY**

Evaluation Criterion	Alternative	
	Proposed Action	No Action
1. Number of cross-connections likely to be implemented during construction activities.	0	0
2. Number of reclaimed water quality parameters that would exceed primary drinking water quality standards.	0	0
3. Number of reclaimed water quality parameters that would exceed unrestricted urban use EPA guidelines for effluent quality.	2	0

Results in Table 3.13-2 indicate reclaimed water would not exceed any of the primary drinking water standards, which are promulgated as mandatory health-related standards by U.S. Environmental Protection Agency (EPA, 1997). Secondary standards are promulgated by the EPA (1997) that apply to substances in water that cause offensive taste, odor, color, corrosion, foaming, or staining, but have no direct affect to human health. For potable water systems, water quality that exceeds secondary standards regulations require that notices be sent to customers. Irrigation water for the Non-potable Surface Water Reclamation Project Service Area would not exceed any secondary drinking water standards.

Effluent from the Southside Water Reclamation Plant Reuse Project would not exceed any primary drinking water standards. Analyses suggested that iron would exceed its secondary drinking water standard in effluent from the Southside Water Reclamation Plant Reuse Project (Table 3.13-2). The presence of iron in water is not considered a health problem because iron is largely non-toxic to humans and just gives the water an unpleasant metallic taste (EPA, 1986). Incidental exposure to an expected concentration 0.8 mg/L would not be considered harmful. Thus, this potential exposure scenario would not be considered an adverse human health risk.

The reclaimed water from the Southside Water Reclamation Plant would meet all except one unrestricted urban reuse (UUR) application guidelines. Unrestricted Urban Reuse guidelines control use of reclaimed water where public exposure is likely, thereby necessitating the highest degree of treatment (EPA, 1992). Parks, playgrounds, and golf courses represent areas where the likelihood of people coming into contact with the reclaimed water would be high. Without treatment, the reclaimed water would exceed the fecal coliform guideline (Table 3.13-1).

The EPA (1992) fecal coliform requirement in irrigation water designated for UUR is non-detectable. The free chlorine residual would be maintained at high enough concentration (about 1 mg/L) in the distribution system to meet UUR fecal coliform disinfecting criteria. The effluent water would be chlorinated to maintain the chlorine residual.

**TABLE 3.13-2
COMPARISON OF RECLAIMED WATER QUALITY AND
DRINKING WATER STANDARDS AND UUR GUIDELINES**

Parameter	Blended Water ^{a/}	SWRP Effluent ^{b/}	Primary Drinking Water Standard ^{c/}	Secondary Drinking Water Standard ^{c/}	UUR EPA Guidelines for Effluent Quality ^{d/}
Aluminum ^{e/}	0.059	0.1		0.2	
Arsenic	0.006	--	0.05		
Barium	0.077	--	2		
Cadmium	0.001	<0.002	0.005		
Chloride	13	90		250	
Chromium	0.002	<0.1	0.1		
Copper	0.003	<0.01	1.3	1	
Fluoride	1.24	1.8	4	2	
Iron ^{f/}	0.013	0.8		0.3	
Manganese	0.001	<0.05		0.05	
Nickel	0.002	<0.005	0.1		
Nitrate	0.98	7.0	10		
Lead	0.004	<0.005	0.01		
pH, units	7.5	7.3		6.5-8.5	
Selenium	0.001	<0.005	0.05		
Sulfate	94	81	500	250	
TDS ^{g/}	306	500		500	
BOD		3.6			10 max.
Turbidity		--			2
TSS ^{h/}		3.0			5 avg.
Fecal coliforms ^{f/}		36			ND
Chlorine residual		0.0			1.0 min.

a/ Source: CH2M Hill, 1999a.

b/ Source: CH2M Hill, 1999b.

c/ Source: U.S. Environmental Protection Agency, 1997.

d/ Source: U.S. Environmental Protection Agency, 1992.

e/ All units in milligrams per liter (mg/L) unless otherwise noted.

f/ Shaded constituents indicate irrigation water parameter concentrations that exceeds standards.

g/ TDS = total dissolved solids.

h/ TSS = total suspended solids

Environmental design features discussed below would be required by the City for construction projects involving water supply lines. Implementing these features would mean no temporary, long-term, or cumulative adverse effects to human health and safety would be expected for the Proposed Action. There are no exceedences of Isleta Pueblo water quality standards from the Proposed Action.

With the No Action alternative facilities would not be constructed so none of the potential operation effects to human health and safety associated with the use of reclaimed water would occur.

3.13.3 Environmental Commitments

3.13.3.1 Environmental Design Features

The following project design features are required by the City for construction projects involving water supply lines. These features would minimize or eliminate potential project effects to human health and safety:

- The treatment process for the Southside Water Reclamation Plant Reuse Project would be designed to meet all applicable standards for Unrestricted Urban Reuse.
- Reclaimed water would be disinfected at the system pump station prior to conveyance to the non-potable water storage reservoir.
- The construction contractor would be required to comply with the City cross-connection ordinance and standards.
- The reclaimed water distribution system would use color-coded (purple) pipe to indicate the presence of non-drinking-quality water.
- Appropriate signs indicating the use of reclaimed water for turf watering, not for drinking, would be posted at all locations where the reclaimed water would be used for irrigation.

3.14 INDIAN TRUST ASSETS, TRIBAL CULTURAL RESOURCES AND TRIBAL HEALTH AND SAFETY

This section addresses the responsibilities of Reclamation to (1) recognize and fulfill its legal obligations to identify, protect, and conserve the trust resources of federally recognized Indian tribes and tribal members and (2) to consult with Pueblos and tribes on a government-to-government basis whenever plans or actions affect tribal trust resources, trust assets, or tribal health and safety.

As part of the coordination activities for this EA, Reclamation issued invitation for government-to-government coordination/consultation letters to nine federally-recognized Pueblos (see Appendix F). Consultation with the six Middle Rio Grande Pueblos, three additional Pueblos and the Bureau of Indian Affairs was requested to identify Indian trust resources that could potentially be affected by the Proposed Action. To date, the Pueblo of Sandia has been the only government that has actively coordinated with Reclamation and has responded with a general identification of concerns and questions about the Proposed Action and the AWRMS. Informally, the Pueblo of Cochiti has indicated a general concern regarding any increased water storage in Cochiti Lake.

The following sections describe the results of the coordination activities and identify the possible effects of its activities on Indian trust resources during the planning, decision, and operational phases of Proposed Action reviews.

3.14.1 Affected Environment

The Rio Grande passes through a total of nine federally-recognized Pueblos located between Abiquiu Reservoir and the Isleta Diversion Dam. The Pueblos include the Cochiti, Isleta, Sandia, Santa Ana, Santa Clara, San Felipe, Santa Domingo, San Ildefonso, and San Juan. Collectively, a total of about 74 miles of the Rio Grande pass through Pueblo lands. The longest river reach is 18 miles across the Cochiti Pueblo and the shortest reach is about 4 miles across the Santa Domingo Pueblo. The two Pueblos located closest to the north and south service areas are the Pueblo of Sandia on the north and the Pueblo of Isleta to the south.

The Pueblo of Sandia occupies a large area of about 22,877 acres north of the City of Albuquerque. The Rio Grande flows through the Pueblo for about 9 miles, starting near Bernalillo and ending near the City of Albuquerque. The southern Pueblo boundary is about 2 miles north of the northern boundary of the Non-potable Surface Water Reclamation Project Service Area. The Pueblo maintains the Sandia Lakes Recreational Area which includes trails and other recreational facilities associated with the Rio Grande bosque (riparian corridor).

Trust resources identified by the Pueblo of Sandia as being of concern included water flows, surface water quality, and riparian areas within the reservation (Baca, 1999). Environmental Consequences.

The Isleta Pueblo occupies about 211,002 acres of area south of the City. It is the closest Pueblo to the south. After leaving the southern City limits and the southside service area, the Rio Grande enters the Pueblo near the I-25 bridge and then flows through the Pueblo for about 10 miles. The distance between the southern boundary of the southside service area and the northern boundary of the Isleta Pueblo is about 7 miles. To date, this Pueblo has not identified any trust resource or asset questions or concerns regarding the Proposed Action. The seven other Pueblos that come in direct contact with river sections would not be affected by operation of the Proposed Action. The 0.02 feet change in surface water elevation would not effect aquatic habitat or affect riparian vegetation near the river. Essentially, the Proposed Action would result in a small (2.4 cfs) augmentation through eight Pueblos, and result in a depletion (2.0 cfs) at the Isleta Diversion Dam.

The effects of the Proposed Action and No Action alternatives to Indian Trust assets are summarized in Table 3.14-1. Land to be affected by the physical construction of structural facilities (i.e., storage tanks, pump stations, and water irrigation systems) would occur on property predominantly owned or managed by state, county, and city governments and on lands owned and managed by private businesses or individuals. There are no tracts or blocks of Indian-owned or managed properties in the proposed project construction areas. None of the project facilities associated with the Proposed Action alignments would be located on known tribal lands.

**TABLE 3.14-1
 SUMMARY OF ANTICIPATED EFFECTS TO INDIAN TRUST ASSETS**

Evaluation Criterion	Alternative	
	Proposed Action	No Action
1. Number of trust assets potentially adversely affected by project construction and operation ^{a/} .	0	0
2. Number of tribal individuals potentially exposed to unhealthful or unsafe conditions by project construction and operation.	0	0
3. Number of listed and identified cultural resources or traditional cultural properties likely to be affected by project construction and operation.	0	0

^{a/} A negative loss is the same effect as a gain. This convention was used to allow an equivalent comparison with other evaluation criteria that track adverse changes. The larger the negative number, the greater the benefit or gain.

The following conditions would be considered resource changes substantial enough to lead to potential resource effects.

- Construction or operation of the project could affect trust assets, tribal health and safety, or cultural resources.

Water volume and water quality in the river were two identified Indian trust resource categories that would be affected by the Proposed Action. The Proposed Action would slightly increase river flow (approximately 2.4 cfs) through the Pueblos of Sandia, Santo Domingo, Cochiti, San Juan, Santa Ana, San Felipe, Santa Clara and San Ildefonso and would have no effect on water quality conditions.

There would be no anticipated direct effects to Indian Trust resources, assets, or tribal health and safety from construction or other types of direct site alterations. None of the proposed pipeline alignments, locations of proposed structural facilities, or temporary river channel alterations would occur on tribal lands. The Pueblo of Sandia expressed concerns regarding the physical effects of installing the water diversion and conveyance facilities. These activities would not affect either the Pueblo or its trust resources because these activities would be located off of Pueblo property. Construction activities would be at least 2 miles downstream of the Pueblo’s southern boundary. There are no required additions to water storage within Cochiti Lake as a result of implementing the Proposed Action.

Relative to the trust resource of interest to the Pueblo of Sandia, the Proposed Action would cause relatively small alterations of existing water volume in the river channel and hydrologic regime in the Rio Grande as it passed across the Pueblo. Between Abiquiu Reservoir and the proposed subsurface water diversion facility, future water supplies would be increased by the 2.4 cfs of San Juan-Chama water that would be delivered to the City. This increase would not be expected to adversely affect water supply (which would increase), water quality (which would not introduce pollutants), or the stability or maintenance of riparian ecosystems of the river banks of the Pueblo of Sandia (no water depletions or alterations of the river’s annual hydrograph would be caused). The timing of water release would be the same as the historical pattern of water releases. Such water vol-

ume and hydrologic changes would be difficult to differentiate from background variations under existing conditions.

Downstream of the wastewater discharge point, existing return flows would be decreased by approximately 2.0 cfs. The maximum expected change in river flows between the City's wastewater treatment plant outfall and the Isleta Diversion Dam is a reduction in flow of 0.60 percent during the month of September, with an annual average flow reduction of 0.17percent (CH2M Hill, 1999).

As detailed in Section 3.5, the City would perform periodic sampling of the reclaimed water as defined in the GWDP (CH2M Hill, 1998c) to confirm that the water quality meets NMED application standards and the City's GPPAP. Changes in water application procedures or additional treatment would be made to remain compliant with applicable standards if monitoring indicates potential problems. The City would conduct an ongoing monitoring program to assure that ground water quality in the project area would not be affected by the proposed project, per NMED, NPDES and GPPAP requirements. By meeting these requirements the Proposed Action would not be expected to adversely affect water quality conditions downstream where the river enters the Isleta Pueblo.

The No Action alternative would not affect identified Indian trust resources and assets.

3.14.2 Environmental Commitments

3.14.2.1 Environmental Design Features

There were no environmental design features or mitigation measures identified or proposed for the Proposed Action to address Indian trust resource and asset concerns because there were no substantial or major effects to Indian trust resources or assets identified by the effects analysis.

3.15 AIR QUALITY

The project-related air quality environmental issues identified during scoping activities are listed in Table 3.1-1. The primary concern included generating and controlling dust during construction.

3.15.1 Affected Environment

The Albuquerque area is an attainment area for criteria pollutants regulated under Clean Air Act guidelines. Ambient air emissions in the evaluation area include emissions from cooling towers, cement and gypsum wallboard manufacturers, and automobiles. In addition, the open space areas along the west side of the project area are sparsely covered with vegetation and are subject to wind erosion. Dust emissions occur during windy days from sparsely vegetated open fields and from industrial facilities that have unprotected sand and gravel stockpiles.

Airborne particulate matter in the City and Bernalillo County area is regulated under the State of New Mexico regulations for Airborne Particulate Matter, Title 20, Chapter 11, Part 20 (20 NMAC (New Mexico Administrative Code)11.20; New Mexico, State of,

1997b). Local activity permitting and regulatory efforts by the City of Albuquerque, Department of Environmental Health are based on this guidance.

3.15.2 Environmental Consequences

By implementing the environmental design features discussed below, as required by the City for construction projects, no temporary, long-term, or cumulative adverse effects to air quality would be expected for the Proposed Action.

The following conditions would be considered environmental changes substantial enough to lead to potential air quality effects.

- Emissions from construction equipment or construction of project facilities that would cause an existing State or federal air quality standard to be met or exceeded.
- Emissions that cause violations or degradation of non-attainment air quality parameters.
- Dust or other emissions from the project site that would cause air quality conditions to degrade.

Approximately 11 percent (4.75 miles) of the pipeline corridors for the Proposed Action would be constructed along streets that are not paved and along arroyos in areas that have minimal ground cover. Dust emissions would be expected to occur during windy days during construction activities. The north service would encounter approximately 13,150 linear feet of unpaved areas and the south service area would encounter about 11,040 linear feet of unpaved areas.

The anticipated effects of the Proposed Action are summarized in Table 3.15-1. The Proposed Action would not exceed existing air quality standards. Dust emissions would not be expected to incrementally degrade existing conditions. The project would not affect non-attainment criteria because the City is designated as an attainment area.

Construction and installation of pipelines in the community are activities that would occur without substantial effects to air quality in the airshed, provided the standard protective measures stipulated by the City's *Development Process Manual* (Albuquerque, City of, 1997) were met. Protective measures are routinely incorporated into standard construction procedures to minimize emissions of regulated pollutants. In general, environmental regulations for air quality are directed at minimizing the level of the blown dust or diesel emissions by specifying control practices to be implemented by the construction contractor.

**TABLE 3.15-1
 SUMMARY OF ANTICIPATED EFFECTS TO AIR QUALITY**

Evaluation Criterion	Alternative	
	Proposed Action	No Action
1. Number of federal air quality parameters likely to be exceeded by construction activities.	0	0
2. Number of state air quality parameters likely to be exceeded by construction activities.	0	0
3. Number of air quality parameters that would likely exceed non-attainment thresholds.	0	0
4. Total length of unpaved route that would be disturbed by construction (linear feet)	24,190	0

The potential extent of temporary air quality effects from construction activities would be related to the total length of pipeline to be installed and the areal size of facilities to be constructed. Larger or longer facilities increase the area of disturbance and the potential for dust emissions. Because the pipeline would be installed at the rate of 400 to 500 feet per day, dust generation effects and construction equipment emissions at any locale would be temporary, lasting only 1 or 2 days. Pipeline routes located in or along existing paved streets would generate substantially lower concentrations of dust that route segments located along unpaved streets or undeveloped open land.

Implementing the environmental design features discussed below, as required by the City for construction projects, would avoid substantial temporary, long-term, or cumulative adverse effects to air quality. There would be no anticipated changes in existing air quality characteristics outside the Non-potable Surface Water Reclamation Project Service Area and the Southside Water Reclamation Plant Reuse Project Service Area.

For the No Action alternative, no facilities would be constructed, and none of the temporary construction effects to air quality would occur.

3.15.3 Environmental Commitments

3.15.3.1 Environmental Design Features

City requirements for construction activities (Albuquerque, City of, 1997) mandate the kind of construction activities associated with this project must include implementation of the following air quality protection measures. Compliance with these measures would be required to obtain City construction permits. Implementation of these design features would ensure that substantial adverse effects to air quality would not result from the Proposed Action.

- Limit the amount of trench that would be open at any time.
- Ensure that construction equipment, including all diesel engines, would meet City opacity standards for operating emissions.

- Conform to the BMPs to minimize particulate and dust emissions from construction work sites that are specified in the City excavation, grading, and surface disturbance permits that would be obtained for this project.
- Adhere to any and all requirements placed on the activity, and be subject to inspection by the City to enforce the requirements of the permits and the requirements of 20 NMAC 11.20.
- Each construction contractor will acquire excavation, grading and surface disturbance permits that specify BMPs to minimize particulate and dust emissions from construction work sites.

The same design measures would be applied to work on the Non-potable Surface Water Reclamation Project and the Southside Water Reclamation Plant Reuse Project.

3.16 ENVIRONMENTAL JUSTICE

This section addresses the requirements of Executive Order No. 12898, which provides minority and low-income populations an opportunity to become involved with development and design of Reclamation activities and on the consequences of proposed Reclamation actions. This Executive Order requires that federal agencies shall make achieving environmental justice part of their missions by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. The executive order applies to all federal actions that require NEPA documentation. There were no environmental justice issues identified during the scoping activities conducted July 15, 1999 and July 22, 1999.

3.16.1 Affected Environment

The project area is composed of a mixture of income levels and land use types, none of which are considered to be predominantly minority populations nor low-income populations. Existing land use and neighborhood characteristics along the corridor alignments, at the proposed locations of pump stations, storage and distribution tanks, water treatment facility, and the subsurface water diversion facility are predominantly business, light industrial, mixed residential land, and open space uses. Field investigations of the areas to be affected by installation and construction activities did not reveal or suggest the presence of community characteristics that would be considered disproportionately minority or low-income neighborhoods.

3.16.2 Environmental Consequences

The following condition would be considered an environmental change substantial enough to create potential concerns about environmental justice effects.

- Minority or low income neighborhoods may be disproportionately affected by project implementation.

Anticipated effects to environmental justice are summarized in Table 3.16-1. As shown in the table, minority or low-income neighborhoods would not be disproportionately affected by implementation of the Proposed Action.

The proposed alignment crosses a wide spectrum of community neighborhood types and income levels. The narrow, linear characteristics of pipeline routes would ensure that there would be no disproportionate concentration of facilities in neighborhoods or community sections that would be considered low-income or predominately minority occupied. The pump stations, water storage reservoirs, and water distribution lines would be located in neighborhoods that are considered middle income or in areas that are primarily devoted to business and light industrial activities. As was noted in the noise and vibration analysis discussion, project construction effects would be anticipated to last no more than 2 days in any particular location along the route alignment. This disruption would be considered to be a temporary nuisance.

The No Action alternative would not require new construction or operational activities. Therefore, there would be no displacement, relocation, economic, or any other type of disproportionate effect to minority or low-income populations of the community.

Pipeline routing was determined by the location and engineering hydraulics of moving water between the existing storage, water source, and distribution facilities. None of the project construction or operational characteristics would require the displacement or relocation of minority or low-income population members.

**TABLE 3.16-1
 SUMMARY OF ANTICIPATED EFFECTS TO ENVIRONMENTAL JUSTICE**

Evaluation Criterion	Alternative	
	Proposed Action	No Action
1. Number of identified minority or low-income communities disproportionately affected by project implementation.	0	0

3.16.3 Environmental Commitments

There were no environmental commitments or mitigation measures identified or suggested for the Proposed Action to address environmental justice concerns because there would be no anticipated disproportionate high and adverse effects to human health or the environmental conditions of minority or low-income groups.

3.17 LAND USE

The project-related land use issues identified during scoping activities are listed in Table 3.1-1. Effects on prime or unique farmland were identified as concerns.

3.17.1 Affected Environment

With the exception of the subsurface water diversion facility, its associated pumping station, and the tie-in to the distribution network, the preponderance of land use types within the project area are urban. These land uses would be further classified as residential (multiple and single family dwellings), light industrial or commercial. The following are identified as users of the reclaimed water: parks (20), schools (9), commercial (5), golf courses (4), sports/recreational complexes (2), hospital (1), and airport (1). There are no prime and unique farmlands in the project area (*Federal Register*, Vol. 43, No. 21, January 31, 1978), as was mentioned in the discussion of soils.

The subsurface water diversion facility would be located within the bosque, south of the Alameda Bridge. Land uses in this area are wildlife habitat and recreational. This area is in the northern section of the Rio Grande Valley State Park, which is managed by the City of Albuquerque Open Space.

3.17.2 Environmental Consequences

The following conditions would be considered environmental changes substantial enough to lead to potential land use effects.

- Loss or substantial degradation of prime or unique farmland
- Changes in land ownership or uses that would cause a substantial shift in property tax revenues from private to government ownership.

The anticipated effects of the proposed project and its alternative are summarized in Table 3.17-1.

**TABLE 3.17-1
 SUMMARY OF ANTICIPATED EFFECTS TO LAND USE**

Evaluation Criterion	Alternative	
	Proposed Action	No Action
1. Number of areas that require a change in existing land use(s) or zoning.	0	0
2. Number of acres that require a change in existing land use(s) or zoning	0	0
3. Total acres of prime or unique farmland adversely affected.	0	0

Coordination would be required between the City’s Open Space Department and Public Works Department to ensure the conversion of the 6 acres of riparian open space for the subsurface water diversion facility would be approved.

The No Action alternative would not require new construction or operational activities. Therefore, there would be no effects to land use or ownership.

The environmental design features discussed below are required by the City for construction projects. Assuming these features would be implemented, no long-term, or cumulative effects to land use would be expected.

3.17.3 Environmental Commitments

The following project environmental design features would be required by the City for construction projects. Compliance with these measures would be required to obtain City construction permits. These features, when implemented, would minimize or eliminate potential project effects to the bosque area and surrounding land uses:

- The contractor would adhere to project work hour restrictions (work allowed only between 7 a.m. to 10 p.m.) within 500 feet of residences, hospitals, and schools.
- Project pipeline alignments would be routed primarily in developed public rights-of-way to minimize activity in undisturbed areas.

3.18 RECREATION

The project-related recreation issues identified during scoping activities are listed in Table 3.1-1. Effects of construction, operation, and maintenance on hike and bike trails and the need to coordinate trail location with subsurface water diversion facility clearings were identified as concerns.

3.18.1 Affected Environment

The City metropolitan area, including the Non-potable Surface Water Reclamation Project Service Area and Southside Water Reclamation Plant Reuse Project Service Area, supports a diverse range of recreation uses.

The diversion structure would be located in the river riparian corridor (i.e., bosque) just south of the Alameda Bridge. The southern part of this site accommodates a paved 10-foot-wide trail as well as the levee road that parallels the Riverside Drain. The levee road in this area is used for many types of recreation including walking, running, roller blading, horseback riding, and bicycling. A pedestrian bridge links the open space area on the east with the trail along the drain. The riparian corridor is used for bird and other types of wildlife observations.

Other recreation areas include parks and golf courses that are distributed among both the north and south service areas. Parks include Bear Canyon Arroyo, which runs alongside El Oso Grande Park. There are paved trails and soccer field in this park. A reservoir would be buried at this site also. The reservoir location at Arroyo del Oso park will be located near soccer fields. Some pipeline construction would be required at all four golf courses.

The Rio Grande is not considered a sport fishery in the area of the Alameda Bridge. Sport fishing and river floating are not considered major recreational uses of the river in this area.

3.18.2 Environmental Consequences

The following conditions would be considered resource changes substantial enough to lead to potential resource effect.

- Loss or substantial degradation of access to or use of playing fields and/or walking and biking trails.

The anticipated effects of the proposed project and the No Action alternative are summarized in Table 3.18-1. Any possible disruptions of normal recreational uses or facilities would be temporary and would not preclude continued uses of the areas that currently exist.

In the riparian corridor, recreation activities would only be affected during the construction and placement of the subsurface water diversion facility and the pump station. Operation of the buried diversion facility would not be expected to adversely affect recreation. A temporary disruption of the paved bike and hike trail uses would occur during construction as trail users would be re-routed a short-distance away from dangerous construction activities. The change in trail use would not be considered a substantial adverse effect because there would be suitable open areas around the construction area to temporarily re-route the trail.

The No Action alternative would not require new construction or operational activities. Therefore, there would be no effects to recreational uses of existing parks, golf courses, and other open spaces.

3.18.3 Environmental Commitments

3.18.3.1 Environmental Design Features

The following project design features would minimize project effects to recreation features and areas:

- The contractor would arrange the construction schedule to limit the number of days in a work location within 500 feet of identified trails or recreation facilities.

**TABLE 3.18-1
 SUMMARY OF ANTICIPATED EFFECTS TO RECREATION**

Evaluation Criterion	Alternative	
	Proposed Action	No Action
1. Total length of hike or bike trail temporarily affected by pipeline or facility construction (linear feet).	250	0
2. Number of playing fields to which access or uses are affected by project construction.	0	0

- While construction occurs in parks or the bosque the construction contractor would have to meet the noise requirements of the City (ACC § 6-22) for noise control on construction equipment.
- If bike or foot trails were temporarily obstructed during construction, where possible a temporary pathway would be arranged to allow passage.

When these features are implemented, long-term, or cumulative effects to recreational areas or facilities would not be expected.

3.19 FLOODPLAINS

The project-related floodplain issues identified during scoping activities are listed in Table 3.1-1. Effects upon floodplains were identified as concerns.

3.19.1 Affected Environment

The subsurface water diversion facility would be located within the bosque, south of the Alameda Bridge. This facility would be located within the floodplain of the Rio Grande in the northern section of the Rio Grande Valley State Park. Construction activities within the floodplain require completion of Corps of Engineers 404 permit procedures.

3.19.2 Environmental Consequences

The following conditions would be considered environmental changes substantial enough to lead to potential floodplain effects.

- Loss or substantial degradation of floodplain areas

The anticipated effects of the proposed project and its alternative are summarized in table 3.19-1.

**TABLE 3.19-1
 SUMMARY OF ANTICIPATED EFFECTS TO FLOODPLAINS**

Evaluation Criterion	Alternative	
	Proposed Action	No Action
1. Total acres of existing floodplain permanently removed from flood carrying capacity	0.5	0

There will be approximately 0.5 acres of wildlife habitat and open space recreation land use that would be removed by the construction and operation of the diversion structure, the associated pumping station, and the access road to the pumping station. This facility is located within the river floodplain. The location would be required to ensure proper operations of the subsurface water diversion facility. Hydrologic analyses of potential changes of flood carrying capacity indicated the proposed designs of the pump station access road and the shape of the pump station foundation would keep backwater and flood stage elevations less than a 1-foot rise as required by permitting requirements (CH2M Hill, 2000e). natural or other beneficial values of the floodplain would not be affected outside of the construction area.

The No Action alternative would not require new construction or operational activities. Therefore, there would be no effects to floodplains.

The environmental design features discussed below are required by the City and the Corps of Engineers for construction projects within the floodplain. Assuming these features would be implemented, no long-term, or cumulative effects to floodplain areas would be expected.

3.19.3 Environmental Commitments

The following project environmental design features would be required by the City for construction projects. Compliance with these measures would be required to obtain City construction permits. These features, when implemented, would minimize or eliminate potential project effects to the bosque area and surrounding land uses:

- The contractor would adhere to project work hour restrictions (work allowed only between 7 a.m. to 10 p.m.) within 500 feet of residences.
- Project pipeline alignments would be routed primarily in developed public rights-of-way to minimize activity in undisturbed areas.

3.20 CUMULATIVE EFFECTS

Appendix E presents a summary of the planned or ongoing projects in the Rio Grande basin that were considered in the evaluation of the potential cumulative effects of the Proposed Action. These planned or ongoing projects include the AWRSI projects, ongoing activities on the river such as upstream wastewater discharges and agricultural water use, and regulatory agency projects affecting river operations and flow patterns.

If the Proposed Action is not implemented, all of the other planned or ongoing activities noted in Appendix E will or are expected to occur (the City's proposed Non-potable Surface Water Reclamation Project would have to be modified to include some additional connections). The potential cumulative effects identified for the Proposed Action are: 1) the net accumulation of 1,434 ac-ft less stream flow per year downstream of the Southside Water Reclamation Plant each year that the project is in operation; 2) the accumulation of 2,750 ac-ft of ground water saved each year; and 3) the addition of 1,700 ac-ft more water in the Rio Grande between Abiquiu Reservoir and the proposed subsurface water diversion facility. The effects of the proposed action, when added to the incremental effects of the North I-25 Industrial Recycling project would result in the use of 6,389 ac-ft/yr. of recycled/reclaimed water. This reclaimed water would replace an equal amount of high quality, deep aquifer ground water.

In the context of basin flows, cumulative stream flow effect attributable to the project remains insignificant. However, in the context of proposed future AWRSI activities, the effects on stream flow may become significant in the future, and will be addressed as those planned projects and potential effects are defined. Likewise, the volume of ground water saved may not be significant with the implementation of this project, but may become significant in the context of proposed future projects associated with the AWRSI, specifically, the Albuquerque Drinking Water Project. Consultations on the potential cumulative effects of these projects on endangered species and Indian Trust Assets would also be conducted.

There were no adverse cumulative effects identified for the proposed project. The incremental effect of reducing ground water withdrawals by using non-potable surface water from the San Juan-Chama project water is considered a beneficial effect to future water supply sustainability. The cumulative effects of incrementally reducing the ground water withdrawals is considered a beneficial effect to the human environment.

SECTION 4

ENVIRONMENTAL COMMITMENTS

Environmental commitments include environmental design features (EDFs) and best management practices (BMPs) that will be incorporated into Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque that are intended to protect environmental aspects of the project area, and mitigation measures (MMs) that are intended to eliminate or minimize potentially adverse changes of environmental resources. Environmental commitments are identified in Table 4-1 for each of the resource areas for which issues were raised during project scoping activities.

The City commits to incorporate these features into the project design, and perform these measures as required to minimize effects, as a condition for the implementation of the project.

**TABLE 4-1
 ENVIRONMENTAL COMMITMENTS**

Commitment Identification	Environmental Commitment	Type of Commitment
Resource Area – Water		
W-01 ^{a/}	The City will perform periodic sampling of reclaimed water as defined in the Ground Water Discharge Plan (GWDP, CH2M Hill, 1998d) to confirm that the water quality meets NMED application standards and the City’s GPPAP.	EDF ^{b/}
W-02 (potential)	The City may have to provide environmental commitment measures to address Section 401 water quality certification conditions. These measures, if any, will be described once they are identified.	EDF, MM
W-03	State approval of the GWDP application would be acquired prior to issuing construction permits for the reclaimed water distribution system (GPPAP requirement).	BMP
W-04	The City would ensure that the reclaimed water quality will meet the appropriate user requirements for industry, turf irrigation, and other uses (Albuquerque, City of, 1998; CH2M Hill, 1999), on an ongoing basis.	BMP
W-05	The City would meter all use of the reclaimed water by all users.	BMP
W-06	The City would create, maintain, and update an accounting system that would document the proposed projects’ effects on the flow regime of the Rio Grande, and would be updated to include the effects	EDF

Commitment Identification	Environmental Commitment	Type of Commitment
	of the City's other planned water reclamation and water supply projects. The accounting system would identify the location(s) and quantity(ies) of water removed from the river, the amount returned to the river, and the amount of water that would be depleted because of water use.	
W-07	During installation of the subsurface water diversion facility, the City would require the construction contractor to use appropriate BMPs to minimize and contain the discharge of suspended sediments into the Rio Grande.	BMP
W-08	During installation of the subsurface water diversion facility, the City would require the construction contractor to maintain an open channel in the Rio Grande with a water velocity less than 1 meter/sec	BMP
W-09	Installation of the subsurface water diversion facility would be conducted during the river's low-flow period September through -March, in accordance with Section 404 permit special conditions.	EDF
W-10	A plan to field monitor the turbidity levels in the river during in river construction will be set up.	EDF
W-11	When developing release schedules for the San Juan-Chama water for the North I-25 Non-potable Surface Water Reclamation project, the city commits to working with the Fish & Wildlife Service, Office of the State Engineer, and Interstate Stream Commission such that releases can be made to benefit the RGSM. However, the City's releases must consistent with State and federal law and must be approved by the Office of the State Engineer. The City's San Juan-Chama water will be released from storage from Abiquiu reservoir in accordance with the conditions set forth in the approved State Engineer's permit. The source of the water is the City's contract with the Secretary of the Interior for San Juan – Chama water from the San Juan – Chama project. The City will be submitting the application for diversion of the City's San Juan – Chama water for this project in January 2001.	EDF
Resource Area – Biological Resources		
BR-01	During construction in the river, any fish stranded by construction of the coffer dam will be salvaged and relocated to a different portion of the river. An agreement with U.S. Fish and Wildlife Service (USFWS) staff will be available to permit USFWS personnel to move individual specimens of the Rio Grande silvery minnow, if this species inadvertently becomes separated from the main river channel by construction activities.	EDF
BR-02	The City will implement all mitigation measures resulting from Reclamation's Section 7 consultation with the USFWS.	MM

Commitment Identification	Environmental Commitment	Type of Commitment
BR-03	The City will restore the bosque and Rio Grande in the area affected by the construction of the project to the original condition or better. During development of the technical plans and specifications for restoration of the Rio Grande channel, the City will coordinate with the Corps of Engineers, Fish & Wildlife Service and Interstate Stream Commission to design a channel section that could provide some area of potential habitat for the Rio Grande silvery minnow. If permits and approvals can not be obtained to construct the channel in that manner, the City will construct the channel to match the existing section as approved.	MM
BR-04	During installation of the subsurface water diversion facility, the City would require the construction contractor to use appropriate BMPs to minimize and contain the discharge of suspended sediments into the Rio Grande.	EDF
BR-05	During installation of the subsurface water diversion facility, the City would require the construction contractor to maintain an open channel (velocity less than 1 meter sec) in the Rio Grande for fish passage around the construction site at all times.	EDF
BR-06	In the year 2000 the City would provide \$50,000 to the Albuquerque Aquarium for construction, staffing and monitoring for Rio Grande silvery minnow egg-holding and rearing facilities - to raise eggs to the young-of-the year stage before the fish are released to upstream transplant locations upstream of the San Acacia diversion dam.	EDF
BR-07	Project pipeline alignments have been routed primarily in developed public rights-of-way to minimize activity in undisturbed areas.	EDF
BR-08	Project facilities to be located in the riparian corridor would be sited and sized to minimize the unnecessary loss of cottonwoods and other native vegetation.	EDF
BR-09	The City will revegetate and enhance the bosque in the area affected by the construction and other areas as determined by the Open Space Division. In addition, the City will participate in a joint project with other local, state and federal agencies to be modeled after the Albuquerque Overbank project. The total funding to be committed for these projects is estimated at \$60,000.	
BR-10	Temporary materials and equipment stockpile areas at the subsurface water diversion facility construction area would be reclaimed and revegetated with suitable woody trees and shrubs	MM
BR-11	In year 2000 the City will provide the USFWS with \$33,500 for the collection and transportation of Rio Grande silvery minnows and \$17,000 for monitoring and sampling surveys.	MM

Commitment Identification	Environmental Commitment	Type of Commitment
BR-12	Installation of the subsurface water diversion facility would be conducted during the river's winter low-flow period of September through March, to avoid to the extent possible the spring snow melt and summer monsoon seasons of high flows in the river, and in accordance with Section 404 permit special conditions.	EDF
BR-13	The City will provide the Fish & Wildlife Service with an annual report detailing the progress of mitigation activities	EDF
Resource Area – Aesthetics and Visual Resources		
AV-01	Appropriate landscaping and interposed wall structures, consistent with the site maintenance, access, and security will minimize visual effect, and prevent vandalism and graffiti. The Public Works Department will coordinate the on-site requirements for construction of project facilities with local and adjacent neighborhood associations.	EDF
AV-02	Reservoir siting and site preparation will minimize vertical intrusion by incorporating lowered elevation (tank base set below surrounding grade where possible), landscaping or blending the base of the tank with existing ground level site contours.	EDF
AV-03	Appropriate landscaping and interposed wall structures, consistent with site access and security, will minimize visual effects.	EDF
AV-04	Appropriate reservoir and wall structure patterns and colors will be used to minimize visual intrusion. The Public Works Department will coordinate the on-site requirements for construction of project facilities with local and adjacent neighborhood associations	EDF
AV-05	Appropriate site access limitations and maintenance activities will be implemented to prevent vandalism and graffiti and to ensure continued visual minimization.	EDF
Resource Area – Traffic and Circulation		
TC-01	The pipeline will be routed in existing utility rights-of-way to minimize length and potential interference with traffic.	EDF
TC-02	The pipeline installation will be bored under major intersections involving state highway crossings to minimize traffic disruption.	EDF
TC-03	The construction contractor will meet City requirements for preparing an impedance analysis and traffic/barricade plan, and will implement appropriate work measures as needed to ensure an adequate level of service on affected streets. This could include such actions as flexible work site scheduling, extended work hours, weekend vs. weekday construction, and non-peak-hour construction.	EDF
Resource Area – Soils and Vegetation		
SV-01	The City will provide guidance regarding irrigation management to all reclaimed water users.	EDF
SV-02	The City will monitor monthly the metered use of reclaimed water.	EDF

Commitment Identification	Environmental Commitment	Type of Commitment
Resource Area – Cultural Resources		
CR-01	A cultural resources discovery plan will be prepared and finalized through consultation with Reclamation and the New Mexico State Historic Preservation Office (SHPO), prior to the beginning of construction. The plan will outline procedures for protecting newly discovered cultural resources, evaluating their importance, and avoiding or mitigating any adverse effects from the project. The plan will include procedures for complying with the Native American Graves Protection and Repatriation Act (NAGPRA), in case human remains are discovered.	EDF
CR-02	Precautions will be taken to make sure that archaeological assistance is promptly available in case of a discovery. The discovery plan approved by Reclamation and the SHPO will detail these measures. Work at a site will cease if cultural resources are unearthed during construction. An archaeologist will respond to telephone calls from the site to evaluate the unearthed materials and ensure that uncovered cultural resources are appropriately recorded or avoided.	MM
CR-03	A pedestrian survey and cultural resources documentation has been conducted prior to construction in those sections of the proposed project area that have undisturbed ground surface. An undisturbed ground surface is defined as a landscape surface without extensive human-caused modification. No cultural resources were found during this survey. All previously recorded sites will be avoided by realigning the project. The inventory phase of the project also identified specific MRGCD facilities that will be affected by the project. The small portions of the irrigation system laterals that will be affected by construction will be rebuilt to their pre-construction condition. Reclamation will consult with SHPO regarding the results of cultural resources identification and avoidance efforts as documented in the cultural resources inventory report.	MM
CR-04	A cultural resources discovery plan has been prepared as part of the cultural resources inventory report. The plan has been approved by Reclamation and will be submitted to SHPO for their approval prior to the beginning of construction. The plan would outline procedures for protecting newly discovered cultural resources, evaluating their importance, and avoiding or mitigating the project’s adverse effects. The plan would also detail procedures for complying with the Native American Graves Protection and Repatriation Act (NAGPRA), in case human remains are discovered.	EDF
CR-05	Historic acequias that are crossed by the proposed non-potable water distribution routes will have less than 1 percent of their total respective areas affected. These acequias would be restored to their present condition if any disturbance to them occurs during the construction of the non-potable water distribution routes.	EDF

Commitment Identification	Environmental Commitment	Type of Commitment
CR-06	Before ground-disturbing construction work takes place, a meeting will be held with construction crews to inform them of the potential for disturbing subsurface cultural resources, and the procedures involved in the event that this occurs. This is especially important with regard to exhuming human remains. The nativity of the Blessed Virgin Mary parish at Alameda Boulevard and the San Jose parish will be notified of the construction schedule in the vicinity of their respective parish churches.	EDF
CR-07	Any cultural resources found during construction will be documented and evaluated as to their National Register eligibility. Reclamation will consult with the SHPO regarding the eligibility of these sites. Any eligible sites or eligible portions of the non-potable water distribution system either will be avoided by realigning the project, or a data recovery plan approved by Reclamation and the SHPO will be implemented to mitigate potentially adverse effects.	EDF
Resource Area – Socioeconomic Factors		
SE-01	Use existing road and utility rights-of-way as much as possible to reduce permitting and land acquisitions cost and to reduce disruptions to commercial facilities.	BMP
SE-02	Hire local construction personnel to build the projects.	BMP
SE-03	Hire and train local professional or service personnel to operate and maintain facilities so direct and secondary spending remains in the local economy.	BMP
Resource Area – Noise and Vibration		
NV-01	Each construction contractor will be responsible for meeting the noise ordinance requirements of the City (ACC § 6-22, Albuquerque, City of, 1981) for noise control on construction equipment.	EDF
NV-02	Each contractor will adhere to project work hour restrictions (work allowed only between 7 a.m. to 10 p.m.) within 500 feet of residences, hospitals, schools, churches, and libraries.	EDF
NV-03	Any potential operational noise from pump stations, reservoirs, or related facilities will adhere to City ordinance requirements (ACC § 6-22, Albuquerque, City of, 1981)	EDF
NV-04	Each contractor will arrange the construction schedule to restrict the number of days in one work location within 500 feet of the same residence, hospital, school, church, or library to 4 days.	EDF
Resource Area – Human Health and Safety		
HH-01	The reclaimed water will be appropriately disinfected prior to distribution to water users.	EDF
HH-02	Each construction contractor will comply with the requirements of the City cross-connection ordinance and standards.	EDF

Commitment Identification	Environmental Commitment	Type of Commitment
HH-03	The reclaimed water distribution system will use color-coded (purple) pipe to indicate the presence of non-drinking-quality water.	EDF
HH-04	Appropriate signs indicating the use of reclaimed water for turf watering, not for drinking, will be posted at all locations where the recycled water is used for irrigation.	EDF
HH-05	The treatment process for the Southside Water Reclamation Plant Reuse Project would be designed to meet all applicable standards for UUR.	EDF
Resource Area – Indian Trust Assets		
	No water flow or quality issues have been identified that would require environmental commitments.	
Resource Area – Air Quality		
AQ-01	Limit the amount of trench that would be open at any time.	BMP
AQ-02	Conform to the BMPs to minimize particulate and dust emissions from construction work sites that are specified in the City excavation, grading, and surface disturbance permits that would be obtained for this project.	BMP
AQ-03	Each construction contractor will be responsible for assuring that construction equipment meets City opacity standards for operating emissions (especially for diesel equipment).	EDF
AQ-04	Each construction contractor will acquire excavation, grading, and surface disturbance permits that specify BMPs to minimize particulate and dust emissions from construction work sites.	BMP
AQ-05	Each construction contractor will adhere to any other requirements placed on the activity, and be subject to inspection by the City to enforce the requirements of the permits and the requirements of 20 New Mexico Administrative Code (NMAC) 11.20 (New Mexico, State of, 1997b).	EDF
Resource Area – Land Use		
LU-01	The contractor would adhere to project work hour restrictions (work allowed only between 7 a.m. to 10 p.m.) within 500 feet of residences, hospitals, and schools.	BMP
LU-02	Project pipeline alignments would be routed primarily in developed public rights-of-way to minimize activity in undisturbed areas.	EDF
LU-03 (potential)	Open Space, Environmental Land Use Committee (ELUC) land-use approval may require an environmental resource commitment. Commitments will be determined during the approval negotiations.	EDF
Resource Area -- Recreation		
RC-01	While construction occurs in parks or the bosque the construction contractor would have to meet the noise requirements of the City (ACC § 6-22) for noise control on construction equipment.	EDF

Commitment Identification	Environmental Commitment	Type of Commitment
RC-02	The contractor would arrange the construction schedule to limit the number of days in a work location within 500 feet of identified trails or recreation facilities.	EDF
RC-03	The City will use standard safety measures to protect existing trail or bicycle path users in areas where trails are temporarily disturbed or blocked by construction. The altered trails or bicycle paths will be restored to their original condition after construction is completed.	BMP
Resource Area – Floodplains		
FP-01	The contractor would adhere to project work hour restrictions (work allowed only between 7 a.m. to 10 p.m.) within 500 feet of residences.	BMP
FP-02	Project pipeline alignments would be routed primarily in developed public rights-of-way to minimize activity in undisturbed areas.	BMP
Resource Area – Environmental Justice		
No potential effects needing commitment measures were identified.		
Resource Area – Public Information		
PI-01	The City will publicize AWRSI projects via the media as these projects go forward. Media could include the City’s internet web page, videos, news releases, meetings with stakeholders, Customer Advisory Committee meetings, and City Council meetings.	EDF

a/ Resource area abbreviations:

- | | | |
|----------------------------------|------------------------------|------------------------------|
| AV = aesthetics/visual resources | HH = human health and safety | RC = recreation |
| AQ = air quality | | SE = socioeconomic factors |
| BR = biological resources | LU = land use | SV = soils and vegetation |
| CR = cultural resources | NV = noise and vibration | TC = traffic and circulation |
| FP = Floodplains | PI = public information | W = water |

b/ Type of commitment abbreviations: BMP – best management practice EDF Environmental design feature MM –Mitigation measure

SECTION 5 CONSULTATION AND COORDINATION

5.1 CONTACTS WITH AGENCY PERSONNEL

The following people were contacted regarding the environmental analyses prepared for this EA.

Clarence Chavez, Soils Survey Scientist
Natural Resources Conservation Service
7500 Jefferson St. NE
Albuquerque, New Mexico
(505) 761-4435
Subject: Soils information in recycled water project area
October 1999

Chris Chadwick, Public Information Officer, Albuquerque District Office
New Mexico Game and Fish Department
3841 Midway Place, NE
Albuquerque, New Mexico 87109
(505) 841-8881
Subject: Fishery and game management
September 1999

Charlie Painter, Endangered Species Biologist
New Mexico Game and Fish Department
Villagra Building
Santa Fe, New Mexico 87503
(505) 827-9901
Subject: Biological resources
September 1999

Nic Medley, Fish Biologist
New Mexico Game and Fish Department
Villagra Building
Santa Fe, New Mexico 87503
(505) 827-9901
Subject: Biological resources
September 1999

Doug Earp, Geohydrologist
City of Albuquerque
Environmental Services Division

P.O. Box 1293
Albuquerque, New Mexico 87103
(505) 768-2633
Subject: Information on ground water depths and crucial aquifer recharge areas
September 1999

Ondrea Linderoth-Hummel, Program Manager
City of Albuquerque Open Space Division
P.O. Box 1293
Albuquerque, New Mexico 87103
Subject: Open space regulations
December 1999

The following pueblos and agencies were contacted regarding the environmental analyses for Indian Trust Assets, tribal cultural resources and tribal health and safety prepared for this EA. Copies of the consultation letters sent to these organizations are provided in Appendix F.

Cochiti Pueblo
Cochiti, New Mexico

Pueblo of Isleta
Isleta, New Mexico

San Felipe Pueblo
San Felipe Pueblo, New Mexico

Pueblo of Santa Ana
Bernalillo, New Mexico

Pueblo of Santo Domingo
Santo Domingo, New Mexico

Pueblo of Sandia
Bernalillo, New Mexico

Bureau of Indian Affairs, Southern Pueblos Agency
Albuquerque, New Mexico

Bureau of Indian Affairs, Albuquerque Area Office
Albuquerque, New Mexico

The following person was contacted regarding the endangered species consultation and FWCA Report for this EA. A copy of the letter requesting informal consultation sent to this agency is in Appendix G.

Joy Nicholopoulos, Field Supervisor
U.S. Department of Interior, Fish and Wildlife Service

New Mexico Ecological Services State Office
2105 Osuna Road NE
Albuquerque, New Mexico 87113
(505) 346-2525

The following person was contacted regarding the cultural resources consultation for this EA. A copy of the consultation letter sent to this agency is in Appendix I.

Jan V. Biella, Deputy State Historic Preservation Officer
Office of Cultural Affairs
Historic Preservation Division
228 East Palace Avenue
Santa Fe, New Mexico 87501
(505) 827-4045

The following persons were contacted regarding the potential for cemeteries located within the project area, and possibly near their parish church. A copy of the letters sent to these churches is in Appendix I.

The Reverend Juan Mendez
Nativity of the Blessed Virgin Mary Parish
9502 4th St NW
Albuquerque, NM 87114

The Reverend Joseph Farias
San Jose Parish
2401 Broadway SE
Albuquerque, NM 87102

5.2 RESOURCE ISSUES IDENTIFIED DURING SCOPING

Information regarding scoping meetings is provided in Section 5.4.2. The following resources areas were identified in scoping meetings as potential areas of environmental concern.

- Water
- Biological resources
- Aesthetics/visual resources
- Traffic and circulation
- Soils and vegetation
- Cultural resources

- Socioeconomic factors
- Noise and vibration
- Human health and safety
- Indian trust assets
- Air quality
- Recreation
- Land use
- Environmental justice
- Cumulative effects

Each of these areas was addressed in the “Affected Environment and Environmental Consequences” section of this environmental assessment. A summary of scoping comments received is presented in Appendix B.

5.3 FORMAL RECOMMENDATIONS BY AGENCIES OR ORGANIZATIONS

No formal recommendations by agencies or organizations were received, other than those comments received at the scoping meetings held for the project.

Recommendations from the USFWS for minimizing effects to fish and wildlife are presented in Appendix H, which contains the *Draft Fish and Wildlife Coordination Act Report for Non-Potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque*. The recommendations that were adopted as environmental commitments are listed in Table 4.1.

5.4 NOTIFICATION

5.4.1 Newspaper and Other Notifications

Notification announcements regarding the public scoping meetings for this EA were placed in the following local newspapers:

- Sunday, July 4, 1999, *Albuquerque Journal* (display advertisement)
- Wednesday, July 7, 1999, *Albuquerque Journal* (display advertisement)
- Sunday, July 11, 1999, *Albuquerque Journal* (display advertisement)
- Wednesday, July 14, 1999, *Albuquerque Journal* (display advertisement)
- Sunday, July 18, 1999, *Albuquerque Journal* (display advertisement)

- Wednesday, July 21, 1999, *Albuquerque Journal* (display advertisement)

Notifications using mailer cards were sent to stakeholders and residents living within 1 mile of the project area. Approximately 500 mailer cards were sent out, including 35 that went to neighborhood associations in the northeast area of Albuquerque and 19 that went to neighborhood associations in southeast of Albuquerque

Notification regarding the availability of the draft EA for public review was published in the *Albuquerque Journal* on July 15, 2000. Copies of the draft EA were made available for public review at the:

- Albuquerque Public Library reference desk at the main downtown location at 501 Copper Avenue NW, Albuquerque, New Mexico, North Valley branch at 7704 2nd St. NW, South Broadway branch at 1025 Broadway SE, Cherry Hills at 6901 Barstow NE, South Valley-Bernalillo County at 3908 Isleta Blvd. SW and at the Ernie Pyle at 900 Girard Blvd. SE.
- City of Albuquerque Public Works Department at the City/County Government Building, One Civic Plaza, Albuquerque, New Mexico.
- Bureau of Reclamation's office in Albuquerque at 505 Marquette NW., Suite 1313, Albuquerque, New Mexico.
- The office of Parsons Engineering Science, located at 3105 Carlisle Blvd. Suite 210, Albuquerque, New Mexico.

It was also made available for public review and comment on a Reclamation web site at <http://www.uc.usbr.gov>. Comments were received through August 14, 2000.

5.4.2 Scoping Meetings

Scoping meetings were held for the project as follows.

5.4.2.1 Agency Coordination

Monthly interagency workgroup meetings have been conducted since January 1999 to present and discuss the AWRSI, including the details associated with the Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque. The focus of these interagency workgroup meetings was to provide federal, state, and local agencies with project progress updates on the AWRSI, identify project implementation regulatory and resource issues and identify solutions, and clarify the scope and approach to AWRSI environmental analyses. These interagency workgroup meetings will continue to serve as a primary forum for presenting project concepts and designs, and to receive agency feedback regarding resource issues and concerns.

Interagency workgroup meetings are open to all interested parties. Meeting announcements, agendas, meeting summaries, and updates are distributed monthly using electronic mail. In addition, hard copies of agendas and meeting summaries are mailed to

agencies that have requested hard copies. Distribution of interagency workgroup information has been sent to representatives of the following agencies:

- Bureau of Indian Affairs,
- Forest Guardians,
- Middle Rio Grande Conservancy District,
- New Mexico Department of Game and Fish,
- New Mexico Energy, Minerals and Natural Resources,
- New Mexico Environment Department,
- New Mexico Interstate Stream Commission,
- New Mexico State Engineer Office,
- 1000 Friends of New Mexico,
- Pueblo of Cochiti,
- Pueblo of Isleta,
- Pueblo of Sandia,
- Pueblo of Santa Ana,
- Pueblo of Santo Domingo,
- Six Middle Rio Grande Basin Pueblos Coalition,
- U.S. Army Corps of Engineers,
- U.S. Bureau of Reclamation,
- U.S. Fish and Wildlife Service,
- Consultants representing multiple agencies.

5.4.2.2 Public Scoping Meeting

Two public scoping meetings were held in the City of Albuquerque.

- The first meeting was held on Thursday, July 15, 1999, from 6:00 to 9:00 p.m. at the Albuquerque Academy East Dining Hall, 6400 Wyoming Boulevard, NE.

- The second public scoping meeting was held on Thursday, July 22, 1999, from 6:00 to 9:00 p.m. at the South Broadway Cultural Center, 1025 Broadway SE.

A list of the issues identified at the meeting is included in Appendix B.

5.5 PUBLIC INFORMATION

The City maintains a public information program to keep the public informed regarding planning and implementation of capital works projects. The City has been using this program to provide information regarding the status of AWRSI projects and upcoming activities. The avenues that the City is using to inform the public include the City's website (www.cabq.gov/waterresources), videos, news releases, meetings with stakeholders, Customers Advisory Committee meetings, and City Council meetings.

5.6 DISTRIBUTION OF THE DRAFT EA

The draft EA was distributed to federal, state, and local agencies; Pueblo governments; stakeholders such as interest groups and homeowners associations; and members of the public who requested copies. The distribution list for the draft EA is provided in Appendix C.

5.7 CULTURAL RESOURCES CONSULTATION

Reclamation submitted a cultural resources consultation request to the SHPO for the Proposed Action on 6/23/2000, (Appendix I). The request included a summary of the proposed construction sites and corridor and was intended to identify previously undisturbed ground surface.

A pedestrian survey for surface cultural resources in the previously undisturbed areas was conducted from November 30, 1999 through December 17, 1999. No cultural resources were found.

Reclamation submitted to the SHPO a survey report that described:

- The absence of cultural resources at the proposed construction location;
- Results of site surveys performed; and
- Mitigation measures to be implemented during construction if cultural resources are encountered.

Reclamation requested concurrence with its determination that no historic properties would be affected by the project, as well as approval of the discovery plan outlined in the cultural resources inventory report.

The Pueblos of Cochiti, Isleta, Sandia, San Felipe, Santa Ana, and Santo Domingo were consulted by letter dated September 3, 1999 regarding the potential effect of the proposed project to Indian Trust Assets, cultural resources and tribal health and safety..

The letter from the Pueblo of Sandia, dated September 27, 1999, indicated their wishes to coordinate with Reclamation. A copy of this letter is provided in Appendix F.

Additional letters, dated 6/22/00, were sent to the following Pueblos; Isleta, Sandia, Santa Ana, San Ildefonso, Santa Clara, San Juan, San Felipe, Santo Domingo and Cochiti as well as BIA agencies. A copy of this letter is provided in Appendix F.

5.8 ENDANGERED SPECIES ACT CONSULTATION

Appendix G contains the correspondence related to the ESA Consultation for this project. This consultation was ongoing during all phases of completing the environmental assessment.

SECTION 6

REFERENCES

- Albuquerque, City of. 1981. Albuquerque City Code, §6-22. Article 9: Noise control. Chapter 9: Health, Safety and Sanitation. Original Ordinance 1974. Amended Ordinance 30-1981. Albuquerque, New Mexico.
- Albuquerque, City of. 1993. *Bosque Action Plan, Rio Grande Valley State Park*. Parks and General Services Department. Albuquerque, New Mexico.
- Albuquerque, City of. 1997. Development Process Manual. Planning Department, Public Works Department (as amended). July.
- Albuquerque, City of. 1998. Balloon Fiesta Park Master Development Plan (Draft). February. Albuquerque, New Mexico.
- Albuquerque, City of. 1999. Comments by the City of Albuquerque on the Proposed Designation of Critical Habitat for the Rio Grande silvery minnow. Public Works Department. Albuquerque, New Mexico.
- Albuquerque, City of and Bernalillo County. 1995. Groundwater Protection Policy and Action Plan. Adopted by the Board of County Commissioners, November 1993, and the Albuquerque City Council, August 1994. Printed January 1995. Albuquerque, New Mexico.
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SECTION 7

LIST OF PREPARERS

Table 7-1 lists the people who were involved in preparing the EA for Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque.

**TABLE 7-1
 PREPARERS OF THE ENVIRONMENTAL ASSESSMENT**

Name	Highest Degree/ Certification	Project Role	Years of Experience	Background
Department of Interior, Bureau of Reclamation (lead federal agency)				
Lori Robertson	M.A. ^{al} , Biology	Environmental protection specialist	15	Aquatic biology, environmental compliance
Signa Larralde	Ph.D., Anthropology	Archaeologist	24	Archaeology of the intermountain West, cultural resources compliance
City of Albuquerque, Public Works Department				
John Stomp	M.S., Civil Engineering; P.E.	Manager, Water Resources Division	11	Water resources, water and wastewater systems
Mark Schmidt	M.S., Civil Engineering; P.E.	Recycled water projects, Water Resources Division	11	Water resources, ground water remediation
Parsons Engineering Science, Inc. (NEPA documentation consultant)				
Chris Viramontes	M.S., Engineering and Environmental Management; P.E., REM	Project manager	13	Ground water remediation, environmental compliance
Rick Billings	M.S. Fisheries science	Technical support	19	Remediation, biology
David Connally	M.S., Oceanography; R.E.A., C.E.P.	Technical support	22	Water resources and water quality

**TABLE 7-1 (Continued)
PREPARERS OF THE ENVIRONMENTAL ASSESSMENT**

Name	Highest Degree/ Certification	Project Role	Years of Experience	Background
Steve Miller	B.A., Economics	Technical support	28	Socioeconomics
Patty Phillips	M.S., Plant ecology	Technical support	4	Ecology, wildlife biology
John Sigler	Ph.D., Fisheries	Technical support	29	Endangered species, aquatic biology
Bruce Snyder	M.S., Wildlife biology; C.W.B.	Technical coordinator	30	Wildlife, wetlands, endangered species, impact analysis
Janet Snyder	B.S., Zoology	Technical editor	24	Biology, technical editing
Lorraine Lucero	Associates Degree	Database management	10	Office administration
R.C. Wooten	Ph.D., Biology and ecology	Technical director	28	NEPA compliance and impact analysis
Ecosystem Management, Inc. (biological and cultural resources consultant)				
Kenneth Brown	Ph.D., Anthropology	Cultural resources	25	Cultural and historical resources
F. Lee Brown (economic consultant)				
F. Lee Brown	Ph.D., Economics	Socioeconomics	36	Resource economics, econometrics
Miller Ecological Consultants (biological resources consultant)				
William Miller	Ph.D., Fisheries	Rio Grande silvery minnow technical lead	25	Aquatic biology, en- dangered species
CH2M Hill (engineering design consultant)				
Michael Bitner	M.S., Geology; R.G.	AWRSI program manager	17	Water resources planning and man- agement
David Schertler	B.S., Civil Engineering; P.E.	Project engineer	23	Water and wastewater civil engineering
Walter Hines	M.S., Civil Engineering; P.E.	Project engineer	30	Water and wastewater civil engineering

**TABLE 7-1 (Continued)
 PREPARERS OF THE ENVIRONMENTAL ASSESSMENT**

Name	Highest Degree/ Certification	Project Role	Years of Experience	Background
Information Illustrated				
Jan Underwood	B.S., Cartography	Graphic design	13	Cartography and graphic information

^{a/} Abbreviations

AWRSI	Albuquerque Water Resources Strategy Implementation
B.A.	Bachelor of Arts
B.S.	Bachelor of Science
C.E.P.	Certified Environmental Professional
C.W.B.	Certified Wildlife Biologist
M.A.	Master of Arts
M.S.	Master of Science
NEPA	National Environmental Policy Act
P.E.	Professional Engineer
Ph.D.	Doctor of Philosophy
R.E.A.	Registered Environmental Assessor
REM	Registered Environmental Engineer
R.G.	Registered Geologist
--	None

**APPENDIX A
APPLICABLE LAWS, REGULATIONS, AND PERMITS**

APPENDIX A APPLICABLE LAWS, REGULATIONS, AND PERMITS

The stated purpose of the proposed project is consistent with Reclamation goals to optimize water uses in areas where Reclamation is a principal water resources manager. Feasibility studies (CH2M Hill, 1999b and 1999c) were prepared for the project to meet the requirements of Reclamation's *Guidelines for Preparing, Reviewing, and Processing Water Reclamation and Reuse Proposals under Title XVI of Public Law 102-575*, as amended (Bureau of Reclamation, 1998). The proposed implementation of the project also must meet the requirements of NEPA, the Endangered Species Act (ESA), and the National Historic Preservation Act (NHPA) and other applicable laws and regulations. This EA addresses part of those requirements.

The State of New Mexico has developed ground water discharge limitations to protect the quality of the ground water in the state (New Mexico, State of, 1997a). The intent is to protect the existing ground water quality from degradation from the discharge of liquids or solids to the environment. These regulations relate to the quality of the water in the ground, not the quality of applied or discharged water. Water that has concentrations of regulated constituents greater than those listed in the regulations can be discharged, as long as the local ground water constituent concentrations remain less than the standards.

Reclaimed surface water or wastewater that is land-applied for irrigation cannot be allowed to contaminate the local ground water quality. A ground water discharge plan (GWDP) must be submitted to the NMED describing the quality of the water to be applied, best management practices (BMPs) to be implemented, and the quality of ground waters in the project area. This plan supports an application to NMED for a GWDP. The City's *GWDP Permit Application* (CH2M Hill, 2000c) to the NMED includes such a plan in support of an application for a ground water discharge permit.

The City adopted the Groundwater Protection Policy and Action Plan (GPPAP) to protect ground water resources within the City service area and Bernalillo County at or above the drinking water standards (Albuquerque, City of and Bernalillo County, 1995). Threats to the ground water were identified, and agricultural practices were indicated as a low-priority threat related to pesticides, herbicides, fertilizers, and irrigation water. The use of reclaimed surface and wastewater may be considered as a similarly low threat. The GPPAP identified action levels at which appropriate actions, such as increased frequency of ground water quality monitoring, will be taken to prevent ground water constituent concentrations from exceeding 50 percent of the primary drinking water standards and 100 percent of the secondary drinking water standards (U.S. Environmental Protection Agency, 1997).

A listing of the required federal, state, and local permits and approvals for Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque is presented in Table A-1. This table also identifies the entity that is responsible for obtaining each permit.

**TABLE A-1
 PROJECT PERMITS REQUIRED ^{a/}**

Source	Permit	Acquisition Responsibility
Federal		
United State Army Corps of Engineers	Clean Water Act, Section 404	City of Albuquerque
United States Fish and Wildlife Service	Endangered Species Act, Section 10 (a)(1)(A)	City of Albuquerque ^{b/}
State		
New Mexico Environment Depart- ment and Water Quality Control Commission	Ground Water Discharge Plan	City of Albuquerque
New Mexico State Engineers Office	Surface Water Diversion Permit	City of Albuquerque
Local		
City of Albuquerque, Open Space Division	Open Space Extraordinary Facility Permit	City of Albuquerque
City of Albuquerque	Lane closure/barricade	Construction contractor
City of Albuquerque	Excavation	Construction contractor
City of Albuquerque	Grading	Construction contractor
City of Albuquerque	Surface disturbance	Construction contractor

a/ Sources: Albuquerque, City of, 1997; CH2M Hill, 1999b and 1999c.

b/ The City will not need to acquire this permit. USFWS staff who possess a permit will conduct the required activities to comply with permit requirements.

APPENDIX B SCOPING SUMMARY

APPENDIX B SCOPING SUMMARY

As part of meeting NEPA requirements for AWRMS implementation, the compliance process must demonstrate that the potentially affected public was provided with an opportunity to identify issues that should be addressed by the project evaluation process. NEPA procedures must ensure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality and should relate to the issues and the decisions to be made. To meet this requirement, two public scoping meetings were conducted to identify issues.

- A Northside public scoping meeting was held on July 15, 1999. A summary of this meeting is provided on pages B-2 through B-9
- A Southside public scoping meeting was held on July 22, 1999. A summary of this meeting is provided on pages B-10 through B-16

Monthly interagency work group meetings were held throughout the EA preparation to ensure that the issues of local, state, and federal agencies were identified and addressed. Agencies that participated in these meetings included, but were not limited to:

- Bureau of Indian Affairs
- City of Albuquerque
- Cochiti Pueblo
- Middle Rio Grande Conservancy District
- New Mexico Energy, Minerals and Natural Resources Department
- New Mexico Environment Department
- New Mexico Department of Game and Fish
- New Mexico Interstate Stream Commission
- New Mexico State Engineer Office
- Pueblo of Isleta
- Pueblo of Santo Domingo
- Pueblo of Sandia
- Pueblo of Santa Ana

- Bureau of Reclamation
- Six Middle Rio Grande Basin Pueblos Coalition
- U.S. Army, Corps of Engineers
- U.S. Fish and Wildlife Service

Scoping Meeting Summary Memorandum

EA for Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque

Public Scoping Meeting regarding the Non-potable Surface Water Reclamation Project

July 15, 1999

The scoping summary memoranda prepared following the public scoping meetings for the Non-potable Surface Water Reclamation Project and the Southside Water Reclamation Plant Effluent Reuse Project detailed the issues raised by public comment at those meetings. This memorandum addresses each of the comments received, and states the action that will be taken to address each comment. The verbatim comment text is shown in a table, with the action to be taken shown to the right.

Background:

The Water Resources Division of the City of Albuquerque Public Works Department held a scoping meeting for Water Reclamation and Reuse Projects, as part of NEPA compliance requirements for public input. The meeting was held from 6 p.m. to 9 p.m. on Thursday, July 15, 1999 at the Albuquerque Academy East Dining Hall. The meeting consisted of an "open house" format, with 5 display stations of project information, poster boards, and maps. A representative manned each station to answer questions and provide information. The intent of the "open house" format was to allow the public to browse at their leisure and interest level, obtain information, ask questions, and to document individual concerns and comments.

Presentation:

The displays at the five stations were organized topically as follows:

- 1) Overall Water Resources Management Strategy - Plan For a Sustainable Water Supply
- 2) Northside Non-Potable Surface Water Reclamation Project Overview with Alternatives A & B
- 3) Southside Water Reclamation Plant Reuse Project with Alternatives A, B, C
- 4) NEPA Process, Scoping Process
- 5) NEPA - Public Input, Resource and Candidate Issues

Both a tape recorder and a flip chart were placed at each station to record public comments and questions. An expert in each topic area was stationed at each station to answer questions and record comments.

A short presentation kicked off the meeting, in which John Stomp, Manager of the Water Resources Division, gave a project overview and Lori Robertson of the US Bureau of Reclamation gave a short overview statement about the NEPA process.

Hirst Company Role:

The Hirst Company provided media, public relations and public involvement support to the public meeting as required, including:

- 1) Placement of an advertisement in July 4, 7, 11, and 14, 1999 editions of the Albuquerque Journal (Sunday and Wednesday editions);
- 2) Coordination of legal notice placement in same editions;
- 3) Direct Mail notices to 35 NE neighborhood associations affected by the project boundaries;
- 4) Follow up phone calls to all neighborhood association representatives including one complete round and additional targeted calls to the associations particularly affected by the proposed pump station/reservoir sites;
- 5) Faxed media advisory on July 13, 1999 to all major media outlets and followed up by telephone calls to reporters and assignment editors.

Attendees:

There were 29 attendees at the July 15, 1999 meeting. 13 attendees were members of the public, including several neighborhood association presidents; 1 representative of Congresswoman Heather Wilson's office; 1 City Councilor – Sam Bregman; 1 representative of the Bureau of Indian Affairs; 8 contractor/subcontractor representatives (Parsons ES, CH2M Hill, Ecosystems Management, and CDM); 2 Hirst Company representatives; and 2 Cooney/Watson Productions representatives.

Potential Emerging Issues:

Several issues emerged as common public concerns or comments regarding water and/or the water reclamation and reuse projects. These emerging issues were recorded by display station monitors and are listed as follows:

Potential Issue	Action Required
Public Misperceptions About Industries' Use of Water: Perception That Industries Are Water Guzzlers/Lack of Understanding of How Much Water Industries Really Use	Address in Public Information Program
Concern Over City Strategy of Green Turf Irrigation vs. Promotion of Xeriscaping and Conservation – Possible Need to Promote Conservation More Intensely	Address in Public Information Program
Need For More Public Communication about the AWRMS (in Non-Technical, Easy to Understand Terms), Involvement and Ongoing Updates	Address in Public Information Program

Potential Issue	Action Required
Expandability/Growth Issues:	Address in EA Project Description
Is The System Expandable	
Is The System Efficient Enough?	
What About Other, New Users as Time Goes On?	
Regional Issues:	Address during EA Consultations and EA Environmental Analysis
Increased Coordination With All Regional Groups	
How Other Groups Have Been Involved In/Could Be Impacted By/Perceive These Projects, Including Tribes	
How Much Water Is Taken From the River and Not Returned	Address in EA Environmental Analysis
Disruption of Road System/Construction Generated by Projects	Address in EA Environmental Analysis

Flip Charts Detailed Summary of Comments July 15, 1999 Scoping Meeting

Comments are organized topically into areas as follows:

Potential Issue	Action Required
Construction Impacts:	Address in EA Project Description
<ul style="list-style-type: none"> • Where will the pipelines be located? There was some confusion that resulted from the general nature of the maps that appeared to show construction/pipelines (for NE project) crossing through private property. This confusion was clarified satisfactorily by explaining that pipelines will not go through private property. • What streets will be torn up? • How will a pipeline enter Tanoan? (Concern it will go through main entrance.) Note: The president of the Tanoan neighborhood association noted that the association uses water from the city's water system to fill its lake, then they irrigate the golf course from the lake-how will this project affect/change that process? (The non-potable system would be hooked up for that purpose.) And the association rep asked, if Tanoan connects to the non-potable water system, can they still keep the potable line in place for emergency backup? • Is the system expandable - in other words, can you add on to it, can the pipelines be extended to irrigate other areas of the city? 	

Potential Issue	Action Required
<p>Construction Impacts:</p> <ul style="list-style-type: none"> • Make sure there are separate pipelines from drinking water pipelines. • Comment about amount of orange barrels and construction impacts. 	<p>Address in EA Project Description and in EA Environmental Analysis.</p> <p>Address during EA Consultations and EA Environmental Analysis</p>
<p>Expandability of the System:</p> <ul style="list-style-type: none"> • As other areas of the city develop, will the city provide non-potable water to them? • Can the project be phased to serve other users? • Can you partner with other users to make the system go farther? • Can the project supply water to residential lawns? • Will the water be available for new uses (new golf courses, lawns) other than the present ones? 	<p>Address in EA Project Description</p>
<p>Availability of Recycled Water:</p> <ul style="list-style-type: none"> • What happens if industrial wastewater is not available? 	<p>Not within the scope of the EA. No further action required.</p>
<p>Regional Issues:</p> <ul style="list-style-type: none"> • What will other public groups say if we take water from the river? • With regards to southside water reclamation and wastewater (sewage) plant, Pueblos expect good water quality coming downstream. • What do the tribes say? 	<p>Address during EA Consultations and EA Environmental Analysis</p>
<p>Environmental Issues:</p> <ul style="list-style-type: none"> • How much/what percent of the wastewater treatment plant's water will be recycled and <i>not</i> returned to the river? (station representative answer: 3.45%) • Where is the water treatment plant going? Could affect river resources. 	<p>Address during EA Consultations and EA Environmental Analysis</p>
<p>Quality of Water/Treatment Issues:</p> <ul style="list-style-type: none"> • Will treatment remove TDS (total dissolved solids)? 	<p>Not within the scope of the EA. No further action required.</p>
<p>Efficiency Issues:</p> <ul style="list-style-type: none"> • Why pump water back up hill? Why treat the water at the plant and use it elsewhere - why not use near plant? Shouldn't another wastewater plant located to the north of the present one be used instead? 	<p>These issues are addressed in the feasibility study for the Proposed Action. Project facilities and routing were determined by the need to match users and supplies, and the economics of constructing and operating the system. A new wastewater treatment plant is a significant capital expense.</p>
<ul style="list-style-type: none"> • Can you coordinate construction and design the system to 	<p>Not within the scope of the EA. No</p>

Potential Issue	Action Required
incorporate both the North and Southside projects, ripping up streets only once (out of EPA funding, not city funding)? • How did you come up with this layout?	further action required.
Cost: • How much will the Northside Non-Potable Surface Water project cost? • On the Southside project, which alternative costs the most?	Address in EA Project Description and EA Environmental Analysis
Timing/Process Issues: • What problems have you encountered to hold up the Southside project? • How are you progressing with the feasibility study? (Southside project) • How long have you worked on this project?	Not within the scope of the EA. No further action required
Timing/Process Issues: • Has this been permitted yet? • Have all the users been contacted? • How long will it take to finish the projects? • Are you doing an EA for each project?	Address in EA Project Description and EA Consultations
General Comments: • Is river water worse than ground water? • Is there any interface between the I-25 Industrial Recycling Project and the Northside Non-Potable Surface Water project? • What is the distance of the surface water diversion facility from the river? (Non-Potable Surface Water project in NE) • What is San Juan-Chama water - is it potable? • Will chlorine kill grass? (Asked many times) • What is a No Action Alternative? • What is the NEPA process? • What is shallow ground water - where is it located, what is it's quality, how much of it exists? • How much of the water that falls to the ground makes it into the aquifer?	Address during EA Project Description, EA Consultations, and EA Environmental Analysis, as required.

Potential Issue	Action Required
<p>General Comments:</p> <ul style="list-style-type: none">• Is there any relationship between the Northside Non-Potable Surface Water project and the Drinking Water project?	<p>The planned action is a component of the City's Water Resources Management Strategy. The relationship of the Proposed Action to the implementation of the strategy will be discussed in the Purpose and Need section of the Environmental Assessment.</p>
<p>General Comments:</p> <ul style="list-style-type: none">• Where do the North I-25 industries get their water from? (representative answer: wells)• Is the North I-25 Industrial Wastewater potable?• With regards to ASR (Aquifer Storage and Recovery) - can you recover all of the water we put back into the ground, or do we lose some to evaporation?• The City needs to do more of these types of conservation and reuse projects.• Will the city put potable, reclaimed water into the ground to recharge the aquifer?• Is UNM concerned about water quality?• Why not irrigate UNM North golf course?	<p>Not within the scope of the EA. No further action required.</p>

Comment Forms
Detailed Summary of Comments
July 15, 1999 Scoping Meeting
(6 forms received)

Do you think the presentation and display stations conveyed the appropriate information? On a scale of 1-5, please check one (5 is highest ranking of yes, it did.)

- 3 people or 50% answered 4, and 3 people or 50% answered 5
- *"Be sure to state the issue in simple everyday terms, because there will be those who don't have a clue as to what the problem is and some of the technical terms used may be over their heads."*
- *"Well-organized and efficient"*

Do you think our approach to implementing the proposed projects and public involvement makes sense to you? If not, what would you recommend?

- *"I think the approach is excellent."*
- *"Yes, too bad more citizens do not show up – need to generate interest via TV, newspaper, etc. Keep putting on these informative sessions."*

- *“Yes, but the chart ‘Transition to a Sustainable Supply’ shows recycling as a very thin band. I know it all adds up but my first reaction is “what’s all the fuss about?”*
- *“Yes”*
- *“Makes very good sense”*
- *“Follow-up needed on most-often asked questions. Such as latest cost estimates, impact on taxes, status of alternatives, etc.”*

Do you have concerns about water reclamation and reuse in general? If so, what are they?

- *“Concern about overall water quality – maybe high salts a problem.”*
- *“Yes, because I plan to keep my residence in Albuquerque and the issue is very important. To worse case it – what would our life be like with H₂O shortage. We all need to do what we can to conserve what we have and plan for the future.”*
- *“No” (no concerns)*
- *“I think that commercial users along with the general public should use rain sensors.”*
- *“Need to get going with it!”*
- *“Primary concern is that water quality will be up to the highest standards comparable to other communities such as Phoenix, Scottsdale, etc. Also, is there an accurate estimate of the stability of the aquifer after water reclamation?”*

After learning about the plan in more detail, do you have any specific concerns about the Northside Non-Potable Surface Water Reclamation Project or the Southside Water Reclamation Plant Reuse Project? If so, what are they? Please specify the project.

- *“They are both excellent and allow additional users and producers. I assume Intel and Rio Rancho are looking at this for future use.”*
- *“I am reassured that a plan for future is being developed and implemented.”*
- *“Make Intel pump their used water to heavy users.”*
- *“Reservoirs and pump stations need to be much more attractive than those now in existence.”*

Are you more informed as a result of this meeting? On a scale of 1-5 (5 being highest of very informed), please check one:

- 4 people or 67% answered 4, 2 people or 33% answered 5
- *“Great Detail”*

What can be done to improve this meeting or what other information needs to be presented in order to make this type of meeting more effective?

- *“Maybe have the various poster presenters have special nametags so they can be easily recognized.”*

- *“Each station gave a good overview and the handouts will be useful.”*
- *“Tell us where to see copies of the engineering reports.”*
- *“Need more public participants. A better incentive.”*
- *“Get more people out. (Have Garduno’s bring dinner)”*

Overall, how would you rate the effectiveness of this meeting? On a scale of 1-5 (5 being the highest of very effective), please check one:

- 1 person or 17% answered 3 (Note on rating of 3) – “because of small turnout”
- 3 people or 50% answered 4
- 2 people or 33% answered 5

Do you have a better understanding of the “NEPA” and “scoping” processes and how you can become involved? Little understanding 1 2 3 4 5 Good Understanding

- 2 people or 33% answered 3
- 3 people or 50% answered 4
- 1 person or 17% answered 5

No comments

Please note other issues or concerns you have that we may have not yet identified:

- *“Believe conservation of our H₂O must continue to be kept in front of citizens – awareness of what they can do. However, the issue is like mass transportation – we once considered it essential to conserve our oil resources but at the same time build better roads and highways which encouraged more automobiles – in the case of H₂O we’re providing things that will not require conservation of H₂O resources.”*
- *“1 - Not clear that any rigorous process was used to select users of the non-potable water. Rather than optimize, used quick engineering judgment. 2 – Consider hierarchy of uses according to water. 3 – Gray water reuse/limited dual water supplies 4 – (Regarding 2 and 3) Very expensive – not for retrofit but for newly developed areas and industries.”*
- *“Just do it.”*
- *“Will the high priority of this project displace or pre-empt other projects which compete for tax dollars? Recent ballot issues have committed tax monies for a number of years and some projects are not fully funded at that. The City must provide some assurance that it can minimize the assessment of new taxes.”*

Scoping Meeting Summary Memorandum

EA for Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque

Public Scoping Meeting regarding the Southside Water Reclamation Plant Reuse Project

July 22, 1999

The scoping summary memoranda prepared following the public scoping meetings for the Non-potable Surface Water Reclamation Project and the Southside Water Reclamation Plant Effluent Reuse Project detailed the issues raised by public comment at those meetings. This memorandum addresses each of the comments received, and states the action that will be taken to address each comment. The verbatim comment text is shown in a table, with the action to be taken shown to the right.

Background:

The Water Resources Division of the City of Albuquerque Public Works Department held a scoping meeting for Water Reclamation and Reuse Projects, as part of NEPA compliance requirements for public input. The meeting was held from 6 p.m. to 9 p.m. on Thursday, July 22, 1999 at the South Broadway Cultural Center. The meeting consisted of an "open house" format, with 5 display stations of project information, poster boards, and maps. A representative manned each station to answer questions and provide information. The intent of the "open house" format was to allow the public to browse at their leisure and interest level, obtain information, ask questions, and to document individual concerns and comments.

Presentation:

The displays at the five stations were organized topically as follows:

- 1) Overall Water Resources Management Strategy - Plan For a Sustainable Water Supply
- 2) Northside Non-Potable Surface Water Reclamation Project Overview with Alternatives A and B
- 3) Southside Water Reclamation Plant Reuse Project with Alternatives A, B, and C
- 4) NEPA Process, Scoping Process
- 5) NEPA - Public Input, Resource and Candidate Issues

Both a tape recorder and a flip chart were placed at each station to record public comments and questions. An expert in each topic area was stationed at each station to answer questions and record comments.

A short presentation kicked off the meeting, in which John Stomp, Manager of the Water Resources Division, gave a project overview and Lori Robertson of the US Bureau of Reclamation gave a short overview statement about the NEPA process.

Hirst Company Role:

The Hirst Company provided media, public relations and public involvement support to the public meeting as required, including:

- 1) Placement of an advertisement in the July 4, 11, 14, 18, and 21, 1999 editions of the Albuquerque Journal (Sunday and Wednesday editions);
- 2) Coordination of legal notice placement in same editions;
- 3) Direct mail notices to 19 SE neighborhood associations affected by the project boundaries;
- 4) Two rounds of reminder/follow up phone calls to all neighborhood association representatives;
- 5) Faxed media advisory to all major media outlets on July 20, 1999 and performed follow up telephone calls to reporters and assignment editors;
- 6) Notices placed in all 6 SE community centers and 2 SE senior centers.

Attendees:

There were 28 attendees at the July 22, 1999 meeting. 11 were members of the public, including representatives from 3 neighborhood associations; 12 from City's Water Resources Division, US Bureau of Reclamation or contractor/subcontractor representatives (Parsons ES, CH2MHill, Ecosystems Management, and CDM); 1 Albuquerque Tribune reporter, Laurie Walker; 2 Cooney/Watson Productions representatives; and 2 Hirst Company representatives.

Potential Emerging Issues:

Several issues emerged as common public concerns or comments regarding water and/or City water reclamation and reuse projects. These emerging issues were recorded by display station monitors.

Potential Issue	Action Required
Public Misperceptions About Industries' Use of Water: <ul style="list-style-type: none">• Perception That Industries Are Water Guzzlers/Lack of Understanding of How Much Water Industries Really Use• Concern Over Possible Industrial Contamination of Municipal Water, Although Procedures are in Place to Prevent this from Occurring	Address in Public Information Program

Potential Issue	Action Required
<ul style="list-style-type: none"> Concern Over City Strategy of Green Turf Irrigation vs. Promotion of Xeriscaping and Conservation – Possible Need to Promote Conservation More Intensely 	Address in Public Information Program
<ul style="list-style-type: none"> Need For More Public Communication about the AWRMS (in Non-Technical, Easy to Understand Terms), Involvement and Ongoing Updates, Although Some Skepticism That City Will Listen to its Residents 	Address in Public Information Program
<p>Need for Longer Term, Larger Strategy:</p> <ul style="list-style-type: none"> Although “Its About Time City Did These Kinds of Projects,” Perception that City Is Still Not Doing Enough Is The System Expandable? Efficient Enough? What About Other, New Users as Time Goes On? 	Address in Public Information Program
<p>Regional Issues:</p> <ul style="list-style-type: none"> Increased Coordination With All Regional Groups How Other Groups Have Been Involved In/Could Be Impacted By/Perceive These Projects, Including Tribes 	Address during EA Consultations and EA Environmental Analysis
How Much Water Is Taken From the River and Not Returned	Address in EA Environmental Analysis
Disruption of Road System/Construction Generated by Projects	Address in EA Environmental Analysis

Flip Charts Detailed Summary of Comments July 22, 1999 Scoping Meeting

Comments are organized topically into areas as follows:

Potential Issue	Action Required
<p>Contamination by and Amount of Water Used by Industry/Manufacturers:</p> <ul style="list-style-type: none"> What does the City do to separate industrial waste from municipal waste? Do you monitor it – and what happens if they violate it? Industrial waste should be separated from municipal waste. Do the North I-25 industries do internal recycling? Spills – is the city responsible? City can fine industries who break the rules or found in non-compliance; however the City and industries have done an excellent job and won Green Awards from the environmental community – the system does work! (related to industries): How much are industrial rates? 	Not within the scope of the EA. No further action required

Potential Issue	Action Required
<p>Cheaper than residential?</p> <p>Public Participation/Communications:</p> <ul style="list-style-type: none"> • Need a central web page with upcoming meetings, events and facts. • (regarding NEPA public process): Have poster board info available as handouts. • Need email distribution system for information flow. • We need a General Assembly where the public is invited and there is intense media exposure. • Implement an informed and organized participation by the community. • I feel like public participation probably doesn't change the outcome. • It doesn't matter what I say, you're going to do it anyway. • There are conflicting studies and information out there about the amount of water we have. 	<p>Address in Public Information Program; announcements regarding the availability of the environmental documents will indicate a Bureau of Reclamation web site where a summary of the documents can be viewed</p>
<p>Construction/Noise Impacts:</p> <ul style="list-style-type: none"> • How disruptive will this project be to the roads? • Will pumps (for Southside project) create a sound noise problem? 	<p>Address in EA Environmental Analysis</p>
<p>Expandability of System:</p> <ul style="list-style-type: none"> • We like alternative C the most because of its expansion capabilities. (Southside project) 	<p>Address in EA Project Description</p>
<p>Regional Context:</p> <ul style="list-style-type: none"> • We need to find ways to get people to talk to each other, it isn't coordinated. • Each group needs to hear about each group's projects so they know what's going on. • What if the Indians claim the City's San Juan-Chama water? 	<p>Not within the scope of the EA. No further action required.</p>
<p>Environmental Topics:</p> <ul style="list-style-type: none"> • How much goes back to the river? • How much water is being taken out of the river? • Will this project (Southside project) take from the river? 	<p>Address in EA Project Description and EA Environmental Analysis</p>

Potential Issue	Action Required
<ul style="list-style-type: none"> • Have you looked at wetlands? (Southside project) • What is the effect on minimum flows? • What is the availability of Rio Grande Silvery Minnow data and habitat structures? • Riparian vegetation is important – how do we get rid of tamarisk? • I believe wetlands are the best to treat to provide reuse water. 	
<p>Quality of Water/Treatment:</p> <ul style="list-style-type: none"> • What is the quality of the wastewater? “Dilution not solution to pollution” • What are the nitrogen levels in the reclaimed water? • How are the salt levels in the reclaimed water going to be addressed? 	<p>Address in EA Environmental Analysis</p>
<p>Project Efficiency/Flexibility:</p> <ul style="list-style-type: none"> • Would like to see entities work together for multi-use benefits i.e., bike, hike trail with surface water Division Facility alignment. • I prefer Alternative B (Northside project) – has more flexibility if failure of a main water line occurs. 	<p>Address in EA Project Description and EA Environmental Analysis</p>
<p>Cost:</p> <ul style="list-style-type: none"> • Who’s paying? (for the overall AWRMS) 	<p>Address in EA Environmental Analysis</p>
<p>Cost:</p> <ul style="list-style-type: none"> • I believe the City should pay the same rate for the water (regardless of whether it’s potable or reused) that residents pay. 	<p>Not within the scope of the EA. No further action required.</p>
<p>General Understanding of Project Elements, Interface Among Projects, Engineering Comments, General Comments, including:</p> <ul style="list-style-type: none"> • Any gray water plans? • Is there high salt in water softeners? • What is the City doing with their sludge? 	<p>Not within the scope of the EA. No further action required.</p>

Potential Issue	Action Required
General Understanding of Project Elements, Interface Among Projects, Engineering Comments, General Comments, including: <ul style="list-style-type: none">• Please address the State Engineer’s calculation methods to application to City of Albuquerque – should go with the science! An surface water diversion facility is preferred over a collector.• (I prefer) wells because: Less impact to bosque; can capture drain flows and reduce pressure on drain flows; its outside flood plain between levees allows for controlled flooding of riparian habitat; it would be easier to maintain on levee service road.• Make sure alternatives (for both projects) are environmentally equivalent, cost-effective and within project budget and schedule!• Will chlorine kill grass?• Who will decide on which alternative is picked? (Southside project)• What kind of return flow credits are you looking at?• How deep is it to ground water?	Address in EA Project Description and EA Environmental Analysis
General Understanding of Project Elements, Interface Among Projects, Engineering Comments, General Comments, including <ul style="list-style-type: none">• What size of pipe (for Southside project) will be used?• Will this project require a NPDES (National Pollutant Discharge Elimination System) permit? (might need for Tijeras Arroyo)	Address in EA Project Description

Comment Forms
July 22, 1999 Scoping Meeting
Detailed Summary of Comments

Do you think the presentation and display stations conveyed the appropriate information? On a scale of 1-5, please check one (5 is highest ranking of yes, it did.)

- 1 person answered 4
- 1 answered 5, “*Very effective*”

Do you think our approach to implementing the proposed projects and public involvement makes sense to you? If not, what would you recommend?

(Both answered) “Yes”

Do you have concerns about water reclamation and reuse in general? If so, what are they?

- “Good idea – should have used gray water years ago”
- “Minimize water loss – avoid planting new grass”

After learning about the plan in more detail, do you have any specific concerns about the Northside Non-Potable Surface Water Reclamation Project or the Southside Water Reclamation Plant Reuse Project? If so, what are they? Please specify the project.

- “Like the idea of pilot plants and research to find better solutions.”

Are you more informed as a result of this meeting? On a scale of 1-5 (5 being highest of very informed), please check one:

- 1 person answered 4
- 1 answered 5

What can be done to improve this meeting or what other information needs to be presented in order to make this type of meeting more effective?

- “Go through slides slower.”
- “More technical details in handouts.”

Overall, how would you rate the effectiveness of this meeting? On a scale of 1-5 (5 being the highest of very effective), please check one:

- 1 person answered 4
- 1 person answered 5

Do you have a better understanding of the “NEPA” and “scoping” processes and how you can become involved? Little understanding_ 1_ 2 _ 3 _ 4_ 5 Good Understanding

- 1 person answered 4
- 1 answered 5

Please note other issues or concerns you have that we may have not yet identified:

- “Favor alternative C (Southside project)– many more use areas for not much more pipe and money”

(2 forms received)

APPENDIX C
DISTRIBUTION OF THE DRAFT ENVIRONMENTAL
ASSESSMENT

APPENDIX C DISTRIBUTION OF THE DRAFT ENVIRONMENTAL ASSESSMENT

(b) U.S. Senator Jeff Bingaman
625 Silver Avenue SW, Suite 130
Albuquerque, NM 87102

(a) Bureau of Indian Affairs
P.O. Box 26567
Albuquerque NM 87125-6567
Attention: Mr. Rob Baracker,
Area Manager

(a) U.S. Army, Corps of Engineers
4101 Jefferson Plaza, NE
Albuquerque, NM 87109
Attention: Mr. Mark Harberg

(a) U.S. Fish & Wildlife Service
2105 Osuna NE
Albuquerque, NM 87113
Attention: Mr. Brian Hanson

(a) Cochiti Pueblo
P.O. Box 70
Cochiti, NM 87072
Attention: Mr. Jay Pecos

(a) Pueblo of Sandia
Box 6008
Bernalillo, NM 87004
Attention: Ms. Beth Janello,
Environmental Affairs Office

(a) Pueblo of Isleta
P.O. Box 1270
Isleta, NM 87022
Attention: Governor Alvino
Lucero

(b) U.S. Senator Pete Domenici
625 Silver Avenue SW, Suite 120
Albuquerque, NM 87102

(a) Bureau of Indian Affairs
Albuquerque Area, Regional Water
Rights
Plaza Maya Bldg.
615 First Street, Suite 301
Albuquerque, NM 87102
Attention: Mr. Art Martinez

(a) U.S. Army, Corps of Engineers
4101 Jefferson Plaza, NE
Albuquerque, NM 87109
Attention: Lt. Col. Thomas Fallin

(a) U.S. Fish & Wildlife Service
2105 Osuna NE
Albuquerque, NM 87113
Attention: Ms. Denise Smith

(a) Cochiti Pueblo Wildlife
Conservation
P.O. Box 70
Cochiti, NM 87072
Attention: Mr. Donald Suina

(a) Pueblo of San Felipe
PO Box 4339
San Felipe Pueblo, New Mexico 87001
Attention: Governor Sam Candelaria

(a) Pueblo of Isleta
P.O. Box 1270
Isleta, NM 87022
Attention: Mr. Jim Piatt,
Environmental Affairs Office

(b) U.S. Representative Heather
Wilson
625 Silver Avenue SW, Suite 340
Albuquerque, NM 87102

(a) Bureau of Indian Affairs
Southern Pueblos Agency
PO Box 1667
Albuquerque NM 87103
Attention: Mr. Albert Gonzales

(a) U.S. Fish & Wildlife Service
2105 Osuna NE
Albuquerque, NM 87113
Attention: Dr. Joy Nicholopoulos

(a) Cochiti Pueblo
P.O. Box 70
Cochiti, NM 87072
Attention: Governor Wilson Romero

(a) Pueblo of Sandia
Box 6008
Bernalillo, NM 87004
Attention: Governor Stuart Paisano

(a) Pueblo of San Felipe
PO Box 4339
San Felipe Pueblo, New Mexico
87001
Attention: Mr. Mike Romero

(a) Pueblo of Isleta
P.O. Box 1270
Isleta, NM 87022
Attention: Mr. Andy C. Padilla

City of Albuquerque

Water Resources Strategy Implementation

Water Reclamation and Reuse

(a) Pueblo of Santa Ana
51 Jemez Dam Road, Suite 107
Bernalillo, NM 87004
Attention: Mr. Todd Caplan
Environmental Affairs Office

(a) Pueblo of Santa Ana
2 Dove Road
Bernalillo, New Mexico 87004
Attention: Governor Lawrence A.
Montoya, Jr.

(a) Pueblo of Santo Domingo
P.O. Box 99
Santo Domingo, NM 87052
Attention: Governor Tony Tortalita

(a) Pueblo of Santo Domingo
P.O. Box 99
Santo Domingo, NM 87052
Attention: Environmental Affairs
Office

(a) Six Middle Rio Grande Basin
Pueblos Coalition
Attention: Mr. Herb Becker
Water Planning Manager

(b) Mr. Stanley Pino
Chairman
All Indian Pueblo Council
3939 San Pedro NE, Bldg. E
Albuquerque, NM 87190

(a) Albuquerque Metropolitan
Arroyo
Flood Control Authority
2600 Prospect NE
Albuquerque, NM 87107
Attention: Mr. John Kelly,
Executive Engineer

(a) City of Albuquerque
Environmental Planning Commission
City Planning Department
PO Box 1293
Albuquerque, NM 87103
Attention: Mr. Joe Chavez, Chairman

(a) Middle Rio Grande Conservancy
District
P.O. Box 581
Albuquerque, NM 87103
Attention: Mr. Subhas Shah

(a) Bernalillo County
Environmental Health Dept.
Director
600 2nd NW, Suite 400
Albuquerque, NM 87102
Attention: Mr. Richard Brusuelas

(a) City of Albuquerque
Parks and General Services
1801 4th Street NW
Albuquerque, NM 87102
Attention: Ms. Sandy Zuchlag

(a) Middle Rio Grande Conservancy
District
P.O. Box 581
Albuquerque, NM 87103
Attention: Mr. Lawrence C.
Troncosa

(a) City of Albuquerque
Director of Environmental Health
P.O. Box 1293
Albuquerque, NM 87103
Attention: Ms. Sarah Kotchian

(a) City of Albuquerque
Director of Parks and General Services
1801 4th Street NW
Albuquerque, NM 87102
Attention: Mr. Pleas Glenn

(a) Middle Rio Grande Council of
Governments
317 Commercial NE Suite 300
Albuquerque, NM 87110
Attention: Mr. Stephen Burstein,
Senior Regional Land Use Planner

(a) New Mexico Department of
Game and Fish
P.O. Box 25112
Santa Fe, NM 87504
Attention: Mr. Andrew Sandoval

(a) New Mexico Environment
Department
Ground Water Quality Bureau
P.O. Box 26110
Santa Fe, NM 87502

(a) New Mexico Environment
Department
Surface Water Quality Bureau
P.O. Box 26110
Santa Fe, NM 87502

(a) New Mexico Interstate Stream
Commission
P.O. Box 25102
Santa Fe, NM 87504-5102
Attention: Mr. Norm Gaume

(a) New Mexico State Highway and
Transportation Department
7500 I-25 Frontage Road
Albuquerque, NM 87109
Attention: Mr. Julian Vigil

(a) State Engineer Office
P.O. Box 25102
Santa Fe, NM 87504-5102
Attention: Mr. Tom Turney

City of Albuquerque

Water Resources Strategy Implementation

Water Reclamation and Reuse

(a) State of New Mexico, Office of
the Natural Resources Trustee
P. O. Box 26110
Santa Fe, NM 87502
Attention: Dr. Steven Cary

(c) Rep. Raymond G. Sanchez
NM State Representative District 15
P.O. Box 1966
Albuquerque, NM 87103

(c) Senator Dede Feldman
New Mexico State Senator District
13
1821 Meadowview Dr. NW
Albuquerque, NM 87104

(c) Rep. Pauline K. Gubbels
NM State Representative District
30
2818 Las Cruces NE
Albuquerque, NM 87110

(c) Senator Sue Wilson
New Mexico State Senator District 19
812 Sagebrush Ct. SE
Albuquerque, NM 87123

(c) Senator Manny M. Aragon
New Mexico State Senator District
14
Drawer Z
Albuquerque, NM 87103

(c) Ms. Barbara Seward
Bernalillo County Commissioner
One Civic Plaza NW
Albuquerque, NM 87102

(c) Mr. Thomas Rutherford
Bernalillo County Commissioner
One Civic Plaza NW
Albuquerque, NM 87102

(a) Bernalillo County Public Works
Division, Director's office
2400 Broadway, SE
Albuquerque, NM 87102
Attention: Mr. Martin J. Garcia

(c) Councilor Alan B. Armijo
District 1 Councilor
Albuquerque City Council
P.O. Box 1293
Albuquerque, NM 87103

(c) Councilor Vincent Griego
District 2 Councilor
Albuquerque City Council
P.O. Box 1293
Albuquerque, NM 87103

(c) Councilor Adele Baca-Hundley
District 3 Councilor
Albuquerque City Council
P.O. Box 1293
Albuquerque, NM 87103

(c) Councilor Brad Winter
District 4 Councilor
Albuquerque City Council
P.O. Box 1293
Albuquerque, NM 87103

(c) Councilor Tim Kline
District 5 Councilor
Albuquerque City Council
P.O. Box 1293
Albuquerque, NM 87103

(c) Councilor Hess Yntema
District 6 Councilor
Albuquerque City Council
PO Box 1293
Albuquerque, NM 87103

(c) Councilor Mike McEntee
District 7 Councilor
Albuquerque City Council
P.O. Box 1293
Albuquerque, NM 87103

(c) Councilor Greg Payne
District 8 Councilor
Albuquerque City Council
P.O. Box 1293
Albuquerque, NM 87103

(c) Councilor Michael Brasher
District 9 Councilor
Albuquerque City Council
P.O. Box 1293
Albuquerque, NM 87103

(c) Ms. Aileen Gatterman
Water Resources-CAC
12215 Casa Grande NE
Albuquerque, New Mexico 87112

(c) Mr. Hector Gonzales
Water Resources-CAC
1219 Isleta SW
Albuquerque, New Mexico 87105

(c) Ms. Bobbi Altman
Water Resources - CAC
8201 Calle Primera NW
Albuquerque, NM 87102

(c) Mr. Jim Morris
Water Resources – CAC
5801 Nugget NE
Albuquerque, NM 87111

(c) Mr. Carlo Lucero
Water Resources – CAC
5924 Guadalupe Trail NW
Albuquerque, NM 87107

(c) Mr. William Gauert
Water Resources – CAC
10433 Prestwick Ct. NE
Albuquerque, NM 87111

City of Albuquerque

Water Resources Strategy Implementation

Water Reclamation and Reuse

(c) Mr. Charles Barnhart
Water Resources – CAC
900 Mesilla NE
Albuquerque, NM 87110

(c) Mr. Norman Churchill
Water Resources – CAC
11509 Desert Classic Lane NE
Albuquerque, NM 87111

(c) Mr. Allen Lipman
Water Resources-CAC
6503 Mendius NE
Albuquerque, New Mexico 87109

(b) Mr. Juan Vigil, County
Manager
Bernalillo County
One Civic Plaza NW, 10th Floor
Albuquerque, NM 87102

(b) Ms. Charlotte Zerof
Water Committee
League of Women Voters
2526 Tramway Terrace Ct. NE
Albuquerque, NM 87122

(b) Ms. Marilyn Morgan
President
League of Women Voters
5015 Prospect Ave. NE
Albuquerque, NM 87110

(a) Rio Grande Restoration
18 Camino Del Rio Grande
Pilar, NM 87571
Attention: Mr. Steve Harris

(a) Sierra Club
207 San Pedro NE
Albuquerque, NM 87108

(a) Southwest Environmental Center
1494A South Solano Dr.
Las Cruces, NM 88001

(a) Defenders of Wildlife
P.O. box 40709
Albuquerque, NM 87196
Attention: Ms. Susan George

(a) New Mexico Audubon Council
60 Barranca Rd.
Los Alamos, NM 87544

(a) Forest Guardians
1413 Second St.
Santa Fe, NM 87505
Attention: Mr. John Horning

(a) National Audubon Society
1901 Pennsylvania Ave. NW
Washington, D.C. 20006

(a) Mr. Blair Brown
Sierra Club
2226 B Wyoming NE #272
Albuquerque, NM 87112

(a) Ms. Consuelo Bokum
1000 Friends of New Mexico
320 Aztec, Suite B
Santa Fe, NM 87501

(a) Ussery & Parrish
P.O. Box 487
Albuquerque, NM 87103
Attention: Mr. David Mielke

(a) Mr. Michael Leon-Guerro
South West Organizing Project
211 Tenth ST. NW
Albuquerque, NM 87102

(b) Ms. Linda Taylor
Dir. Border Environmental Project
Southwest Research & Information
Center
105 Stanford SE
Albuquerque, NM 87106

(b) Mr. Robert Hoffman
Executive Director
Economic Forum
2400 Louisiana NE
Bldg. 4 – Suite 200
Albuquerque, NM 87110

(a) Mr. Les Ramirez
PO Box 4546
Albuquerque, NM
87196

(a) Pueblo of Santo Domingo
PO Box 99
Santo Domingo, NM 87052
Attention: Mr. Ernest Coriz

(c) Mr. Bruce Thomson, Chairman
Ground Water Protection Advisory
Board
1018 Idlewilde Lane SE
Albuquerque, NM 87108

(c) Mr. Gary Tonjes
President
Albuquerque Economic Development
851 University Blvd. SE Suite 203
Albuquerque, NM 87106

(c) Ms. Catherine Ullett
Executive Director
New Mexico Press Association
2531 Wyoming NE
Albuquerque, NM 87112

	(c) Mr. Shaun Parish Maintenance Manager Sumitomo Sitix Silicon, Inc. 9401 San Mateo Blvd. NE Albuquerque, New Mexico 87113	(c), Mr. Keith R. Hampe Plant Manager Sumitomo Sitix Silicon, Inc. 9401 San Mateo Blvd. NE Albuquerque, New Mexico 87113
(c), Mr. Terry B. Sullivan Plant Manager Philips Semiconductors 9201 Pan American Freeway MS02 Albuquerque, New Mexico 87113	(c), Mr. Bob Marrah Vice President and General Manager Honeywell Defense & Avionics Systems 9201 San Mateo NE Albuquerque, New Mexico 87113	(c) Ms. Kathy Haq Communications Manager Phillips Semiconductors 9201 Pan American Freeway MS02 Albuquerque, New Mexico 87113
(c) Mr. Heinz Rebmann Vice President Philips Semiconductors 9201 Pan American Freeway MS02 Albuquerque, New Mexico 87113	(c) Mr. Dean Olson, President Elder Homestead Neighborhood Association 812 Indiana SE Albuquerque, New Mexico 87108	(c) Mr. Herb Edmon, Jr., President Kirtland Community Association 1505 San Jose SE Albuquerque, New Mexico 87106
(c) Ms. Deanna DeSutter, President Nob Hill Neighborhood Association 310 Richmond SE Albuquerque, New Mexico 87169	(c) Ms. Lisa Schrelbman, President Parkland Hills Neighborhood Association 4819 Idlewilde Ln. SE Albuquerque, New Mexico 87108	(c) Mr. L. Don Daigle, President Siesta Hills Neighborhood Association 6412 Mitchell Rd. Albuquerque, New Mexico 87108
(c) Mr. Bill Cobb, President Silver Hill Neighborhood Association 1701 Silver Ave. Albuquerque, New Mexico 87106	(c) Ms. Mary Agnes Gilbert, President South San Pedro Neighborhood Association 736 Indiana SE Albuquerque, New Mexico 87108	(c) Ms. Kin Armano, President Southeast Heights Neighborhood Association 814 Carlisle Dr. SE Albuquerque, New Mexico 87106
(c) Mr. Frank O'Sullivan, President Spruce Park Neighborhood Association Inc. 1206 Las Lomas Rd. NE Albuquerque, New Mexico	(c) Mr. Chuck Spurgeon, President Sunport Business Association P.O. Box 80953 Albuquerque, New Mexico 87198	(c) Mr. Peter Schillke, President Sycamore Neighborhood Association 1217 Coal Avenue SE Albuquerque, New Mexico 87106
(c) Mr. Alvorn Clifton, President Rumbull Village Association 508 Rhode Island SE Albuquerque, New Mexico 87108	(c) Mr. Steve Schroeder, President Victory Hills Neighborhood Association 909 Princeton SE Albuquerque, New Mexico 87106	(c) Mr. Danny Hernandez, President University Heights Neighborhood Association 2133-½ Eton SE Albuquerque, New Mexico 87106
(c) Mr. Joseph B. Valentine, President Yale Village Neighborhood Association	(c) Mr. Mardon Gardella, President Federation of University Neighborhoods 411 Maple St. NE	(c) Mr. Bill Bowers, President Academy Acres North Neighborhood Association P.O. Box 92515

City of Albuquerque

Water Resources Strategy Implementation

Water Reclamation and Reuse

2126 Cornell Dr. SE
Albuquerque, New Mexico 87106

Albuquerque, New Mexico 87106

Albuquerque, New Mexico 87199

(c) Ms. Debbie Barnett, President
Academy Estates East
Neighborhood Association
8912 Camino Osito NE
Albuquerque, New Mexico 87111

(c) Mr. Ted Leamons, President
Academy Estates #1 Home Owners
Association
5308 Knight Rd. NE
Albuquerque, New Mexico 87109

(c) Mr. Raymond Franks, President
Academy Hills Park Neighborhood
Association
6008 Estrellita del Norte NE
Albuquerque, New Mexico 87111

(c) Ms. Steffi Alves, President
Academy North Neighborhood
Association
8220 Parrot Run NE
Albuquerque, New Mexico 87109

(c) Mr. James Wiseman, President
Academy Park Home Owners
Association
6809 Kelly Ann Rd. NE
Albuquerque, New Mexico 87109

(c) Ms. Luella Wallace, President
Academy Ridge East Neighborhood
Association
10924 Academy Ridge Rd. NE
Albuquerque, New Mexico 87111

(c) Mr. Ken Shirley, President
Antelope Run Neighborhood
Association
6309 Elk Horn Dr. NE
Albuquerque, New Mexico 87111

(c) Mr. Phil Loyd, President
Arroyo Del Oso South Neighborhood
Association
7509 Vista del Arroyo NE
Albuquerque, New Mexico 87109

(c) Mr. Walter F. Huebner, Jr.,
President
Bear Canyon Neighborhood
Association
6717 Hensch NE
Albuquerque, New Mexico 87109

(c) Ms. Sandra P. Richardson,
President
Cherry Hills Civic Association
6920 Sandalwood Pl. NE
Albuquerque, New Mexico 87111

(c) Mr. Horst Odparlik, President
Crestview Patio Home Owners
Association
9100 Osuna Pl. NE
Albuquerque, New Mexico 87111

(c) Mr. Dan Duran, President
Del Norte Neighborhood Association
4300 Topke Ct. NE
Albuquerque, New Mexico 87109

(c) Ms. June Harrington, President
Eisenhower Area Neighborhood
Association
5712 Bartonwood Pl. NE
Albuquerque, New Mexico 87111

(c) Mr. Thomas Pratt, President
Estates at Tanoan Home Owners
Association
1502 City Lights Dr. NE
Albuquerque, New Mexico 87111

(c) Ms. Mary Beth Tabacchi,
President
Glenwood Hills Neighborhood
Association
4420 Glenwood Hills NE
Albuquerque, New Mexico 87154

(c) Mr. Steve Lindsley
Gutierrez/Northridge
Neighborhood Association
8505 Gutierrez NE
Albuquerque, New Mexico 87111

(c) Mr. Vic Segura
Heritage East Association of Residents
9118 Meriwether Ave. NE
Albuquerque, New Mexico 87109

(c) Ms. Judie Pellegrino
Heritage Hills neighborhood
Association
8515 Murrelet NE
Albuquerque, New Mexico 87113

(c) Ms. Pamela G. Scanlon,
President
High Desert Resident Owners'
Neighborhood Association
1607 Calle del Rancho NE
Albuquerque, New Mexico 87106

(c) Ms. Bettina Eklund, President
John B. Robert Neighborhood
Association
5508 Avenida Cuesta NE
Albuquerque, New Mexico 87111

(c) Ms. Darlene Koran, President
Lagrima De Oro Neighborhood
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10271 Gutierrez NE
Albuquerque, New Mexico 87111

(a) Mr. Alex Romano, President

(c) Board of Directors, c/o Kathy

(c) M. Dale Hite, President

City of Albuquerque

Water Resources Strategy Implementation

Water Reclamation and Reuse

New Holiday Park Neighborhood Association
11515 Manitoba NE
Albuquerque, New Mexico

Pacheco Mission Hill North Condo Association
8441 Chambers Ct. NE
Albuquerque, New Mexico 87111

Nor Este Neighborhood Association
8509 Curt Walters Ct. NE
Albuquerque, New Mexico 87122

(c) Mr. Tom Trodden, President
North Albuquerque Acres Community Association
11424 Pino NE
Albuquerque, New Mexico 87122

(c) Mr. Raymond Irwin, President
North Wyoming Neighborhood Association
7804 Krista Dr. NE
Albuquerque, New Mexico 87109

(c) Mr. Russell Lee, President
Oso Grande Neighborhood Association
5101 Noreen Dr. NE
Albuquerque, New Mexico 87111

(c) Mr. Abdi Salehi, President
Peppertree/Royal Oak Residents Association
5715 Papaya Pl. NE
Albuquerque, New Mexico 87111

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Prospector's Ridge Association of Residents
11608 San Victorio NE
Albuquerque, New Mexico 87111

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Sandia Heights Home Owners Association
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Albuquerque, New Mexico 87191

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Stonegate Village Neighborhood Association
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Albuquerque, New Mexico 87191

(c) Mr. Dick Wilhelmi, President
Tanoan Community Association of Residents
9410 Seabrook Dr. NE
Albuquerque, New Mexico 87111

(c) Ms. Carole Pigaty, President
Tanoan East Neighborhood Association
7005 Sky Valley Water NE
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(c) Mr. Steve Wentworth, President
Alameda North Valley Association
8919 Boe Lane
Albuquerque, NM 87113

(c) Mr. Joe Harris, President
North Valley Neighborhood Association
4410 Rio Grande Blvd. NW
Albuquerque, New Mexico 87107

(c) Mr. Rob Amsden, President
Sun North Estates Association
5129 Stream Street NE
Albuquerque, New Mexico 87113

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P.O. Box 10103
Albuquerque, New Mexico 87184

(c) Mr. Larry Caudill, President
Wildflower Area Neighborhood Association
4915 Watercress NE
Albuquerque, New Mexico 87111

(c) Mr. Claude L. Lewis, President
Highland Merchants and Neighborhood Association
465 Jefferson NE
Albuquerque, New Mexico 87108

(c) Mr. Mike Schroeder, President
Coronado Acorn Tenant Union
8401-272 Pan American Freeway NE
Albuquerque, New Mexico 87102

(c) Mr. Albert Gustafson, President
Pleasant View Mobile Home Association
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Albuquerque, New Mexico 87113

(c) Ms. Patricia Verrelle
Vineyard Estates Neighborhood Association
8415 Vintage Dr. NE
Albuquerque, New Mexico 87122

(a) Ms. Jennifer A. Salis bury
Energy, Minerals and Natural Resources
2040 S. Pacheco St
Santa Fe, NM 87505

Notes:

- (a) = Draft EA distributed to this agency/individual.
- (b) = Draft EA and executive summary distributed to this agency/individual.
- (c) = Executive summary distributed to this agency/individual.

**APPENDIX D
 ENVIRONMENTAL CRITERIA RESULTING IN
 ZERO QUANTITIES
 USED IN THE EFFECT EVALUATION**

**SUMMARY OF ENVIRONMENTAL EVALUATION CRITERIA AND
 COMPARISON OF ALTERNATIVES**

Evaluation Criteria	Alternative	
	Proposed Action	No Action
Water		
10. Number of existing surface water and ground water uses that would be impaired by using reclaimed water.	0	0
11. Number of water quality parameters exceeding State ground water concentration standards.	0	0
12. Number of water rights holders in the Middle Rio Grande whose access to water or water use activities are restricted by project construction and operation.	0	0
13. Percent reduction in overbank flooding potential.	0	0
Biological Resources		
31. Total number of federal-listed species that are adversely affected.	0	0
32. Total number of State-listed species that are adversely affected.	0	0
33. Total number of designated critical habitat areas that are adversely affected.	0	0
34. Total acres of designated critical habitat degraded or lost.	0	0
35. Total acres of potential Southwestern willow flycatcher habitat permanently lost as a result of project construction or operation.	0	0
36. Total number of wetland areas adversely affected by construction.	0	0
37. Number of known raptor nest sites lost because of construction.	0	0
38. Number of known bald eagle nest sites lost or disturbed because of construction.	0	0
39. Acres of potential bald eagle forage area lost or disturbed because of construction.	0	0
40. Acres of jurisdictional herbaceous wetlands that would be lost due to ground water elevation drawdown of 1.5 feet or more below the existing average ground water depth for a period of at least one month during the growing season.	0	0
41. Acres of jurisdictional herbaceous wetlands that would experience substantial changes in overall community plant structural composition resulting from a ground water decline of 1 foot or more for at least one	0	0

Evaluation Criteria	Alternative	
	Proposed Action	No Action
month due to ground water elevation drawdown.		
42. Acres of jurisdictional woody wetlands that would be lost due to ground water elevation drawdown of 3 feet or more below the existing average ground water depth for a period of at least one month during the growing season.	0	0
43. Acres of jurisdictional woody wetlands that would experience substantial changes in overall plant structural composition resulting from a ground water elevation drawdown of 1–3 feet for at least one month due to ground water elevation drawdown.	0	0
44. Acres of non-jurisdictional herbaceous wetlands that would be lost due to ground water elevation drawdown of 1.5 feet or more below the existing average ground water depth for at least one month during the growing season.	0	0
45. Acres of non-jurisdictional herbaceous wetlands that would experience substantial changes in overall plant structural composition resulting from a ground water elevation drawdown of 1 foot or more below the existing average ground water depth for at least one month during the growing season.	0	0
46. Number of jurisdictional herbaceous wetlands that would be lost due to ground water elevation drawdown of 1.5 feet or more below the existing average ground water depth for a period of at least one month during the growing season.	0	0
47. Number of jurisdictional herbaceous wetlands that would experience substantial changes in overall community plant structural composition resulting from a ground water decline of 1 foot or more for at least one month due to ground water elevation drawdown.	0	0
48. Number of jurisdictional woody wetlands that would be lost due to ground water elevation drawdown of 3 feet or more below the existing average ground water depth for a period of at least one month during the growing season.	0	0
49. Number of jurisdictional woody wetlands that would experience substantial changes in overall plant structural composition resulting from a ground water elevation drawdown of 1 to 3 feet for at least one month due to ground water elevation drawdown.	0	0
50. Number of non-jurisdictional herbaceous wetlands that would be lost due to ground water elevation drawdown of 1.5 feet or more below the existing average ground water depth for at least one month during the growing season.	0	0
51. Number of non-jurisdictional herbaceous wetlands that would experience substantial changes in overall plant structural composition resulting from a ground water elevation drawdown of 1 foot or more below the	0	0

Evaluation Criteria	Alternative	
	Proposed Action	No Action
existing average ground water depth for at least one month during the growing season.		
Aesthetics and Visual Resources		
8. Approximate percent of tank perimeter within 10 feet of ground's surface that would not be screened by vegetation or barrier treatments.	0	0
9. Approximate percent of tank perimeter within 10 feet of ground's surface that would allow unrestricted access and potential for vandalism.	0	0
10. Number of facilities that would be located in a sensitive viewshed or viewing area.	0	0
Traffic and Circulation		
5. Number of street segments where anticipated traffic delays would exceed City requirements.	0	0
Soils and Vegetation		
5. Water quality parameters in irrigation water that would have an adverse effect on plant growth.	0	0
6. Acres of land that would not be suitable for irrigation.	0	0
7. Number of plant species that would experience toxic effects resulting from irrigation with the reclaimed water.	0	0
Cultural Resources		
4. Number of potentially-eligible cultural resources sites or traditional cultural properties likely to be affected by project construction and operation..	0	0
Socioeconomic Factors		
8. Number of businesses or commercial operations along the pipeline route that would require relocation or closing.	0	0
Noise and Vibration		
6. Number of expected cases when construction activities would exceed City vibration standards.	0	0
7. Number of expected cases when operation activities would exceed City vibration standards.	0	0
8. Number of expected cases when construction activities would exceed City noise standards.	0	0
9. Number of expected cases when operation activities would exceed City noise standards.	0	0
Human Health and Safety		
4. Number of cross-connections likely to be implemented during construc-	0	0

Evaluation Criteria	Alternative	
	Proposed Action	No Action
tion activities.		
5. Number of reclaimed water quality parameters that would exceed primary drinking water quality standards.	0	0
Indian Trust Assets, Cultural Resources and Tribal Health and Safety		
5. Number of tribal individuals potentially exposed to unhealthful or unsafe conditions by project construction and operation.	0	0
6. Number of listed and identified cultural resources or traditional cultural properties likely to be affected by project construction and operation.	0	0
7. Isleta Pueblo water quality standards likely to be exceeded by project operations	0	0
Air Quality		
5. Number of federal air quality parameters likely to be exceeded by construction activities.	0	0
6. Number of state air quality parameters likely to be exceeded by construction activities.	0	0
7. Number of air quality parameters that would likely exceed non-attainment thresholds.	0	0
Environmental Justice		
2. Number of identified minority or low-income communities disproportionately affected by project implementation.	0	0
Recreation		
3. Number of playing fields to which access or uses are affected by project construction.	0	0
Land Use		
4. Number of areas that require a change in existing land use(s) or zoning.	0	0
5. Number of acres that require a change in existing land use(s) or zoning.	0	0
6. Total acres of prime or unique farmland adversely affected.	0	0
Total Least Change (number of designations)	2	30
Total Most Change (number of designations)	30	2
Relative Rank (1 = preferred) ^{a/}	2	1

a/ A negative loss is the same effect as a gain. This convention was used to allow an equivalent comparison with other evaluation criteria that track adverse changes. The larger the negative number, the greater the benefit or gain

b/ alternative responsible for least change for the evaluation criteria

- c/ alternative responsible for most change for the evaluation criteria
- d/ ranking based on environmental evaluation only; see text

APPENDIX E CUMULATIVE EFFECTS ANALYSIS

APPENDIX E CUMULATIVE EFFECTS ANALYSIS

Table E-1 summarizes the planned or ongoing projects in the Rio Grande basin that were considered in the evaluation of the potential cumulative effects of the Proposed Action. Table E-2 summarizes the potential cumulative effects of planned and ongoing projects in the Rio Grande Basin on the environmental resources evaluated in this environmental assessment.

**TABLE E-1
 CUMULATIVE EFFECTS ANALYSIS -
 SUMMARY OF PLANNED OR ONGOING PROJECTS
 IN THE RIO GRANDE BASIN**

Project	Description
City of Albuquerque - Non-potable Water Reclamation and Reuse, Northeast Heights and Southeast Albuquerque (Proposed Action)	This project, which includes the Non-potable Surface Water Reclamation Project and Southside Water Reclamation Plant Reuse Project, is a component of the AWRSI. It is described in detail in Section 2.4 of this EA.
City of Albuquerque -North I-25 Industrial Recycling Project	This project is a component of the AWRSI. Construction was recently completed, and it is currently coming online. It is the first step in the implementation of the engineering projects designed to reduce ground water use and implement a sustainable water supply use pattern. Treated effluent from local industrial processes will be used for turf irrigation and other uses that do not require drinking-quality water. The expected volume of effluent available from these industrial sources is approximately 1 mgd. This water will replace both existing and future ground water pumping for these activities.
City of Albuquerque - Drinking Water Supply Project (planned)	This project, a component of the AWRSI, is proposed for implementation in 2005. Surface water from the City's San Juan-Chama supplies will be diverted, treated, and distributed to the City's customers. Infrastructure required includes a water diversion, water treatment plant, and distribution facilities to move the water into the City's existing distribution system. The project would include an aquifer storage and recovery component, whereby treated San Juan-Chama water is stored in aquifers under the City during times of surplus to replenish ground water, and used in the future when supplies from the river are not available. The City expects to fully utilize its San Juan-Chama allotment (approximately 48,200 ac-ft per year) through this project.
City of Albuquerque – Actions to address water quality in the Rio Grande below Central Avenue Bridge (ongoing)	The City discharges treated effluent into the Rio Grande at an average rate of about 80 cubic feet per second (cfs). The City has an agreement with the MRGCD to maintain a discharge of at least 250 cfs at the Central Bridge in Albuquerque. These actions involve water quality issues and ensure permanent flows from Cochiti Dam to Isleta Diversion Dam.

City of Albuquerque -
Seasonal effects on ground
water use to meet demands
(ongoing)

The water demand for turf irrigation in Albuquerque varies by season. Turf irrigators throughout the City use considerably more water during the summer than during the winter. Peak summer demands for turf irrigation water in the project area will exceed the supply available from the City's planned water reclamation project sources. During these periods of higher demand, ground water will continue to be used as a supplementary source of turf irrigation water. However, this demand will be at reduced amounts compared to the existing situation, because of the off-setting effects of the supply of reclaimed industrial effluent water. As a result of the implementation of the Proposed Action, less ground water will be required, on an annual basis, for turf irrigation. The expected annual average ground water use for these activities is unquantified.

City of Albuquerque -
Deep aquifer mining
(ongoing)

Even with implementation of the Drinking Water Supply Project (above), the City will continue to rely on ground water for part of its water supply. This continued use of ground water may continue to exceed the recharge of the ground water basin, both through natural recharge or in combination with an aquifer storage and recovery component. Even with the implementation of the Drinking Water Project and Aquifer Storage and Recovery, ground water use is expected to exceed the rate of recharge after around 2040. Therefore, additional water sources will eventually need to be identified if water use demands continue as estimated.

Bureau of Reclamation -
River maintenance activities
(ongoing)

Reclamation maintains the river channel for the Middle Rio Grande Project from Velarde, New Mexico to Caballo Dam. The goals of the program are to: 1) provide for the effective transport of water and sediment to Elephant Butte Reservoir; 2) conserve surface water in the Rio Grande basin; 3) reduce the rate of aggradation in the Rio Grande; and 4) protect certain riverside structures and facilities. River maintenance activities include bank stabilization/bioengineering/habitat enhancement techniques, river training works, sediment removal, vegetation control, levee maintenance, and access and construction requirements. Current projects include activities to restore native habitat, conserve threatened and endangered species, maintain bosque function and values, minimize adverse water quality effects, and allow fluvial processes to occur to the extent possible.

Bureau of Reclamation -
Acquisition of supplemental
water (ongoing)

Since 1996, Reclamation has acquired water to provide for the survival and recovery of the Rio Grande silvery minnow. San Juan-Chama Project water has been provided to supplement the middle valley, thereby allowing the MRGCD to bypass native flows for the silvery minnow. The majority of supplemental water has been made available through contract with the City of Albuquerque (up to 30,000 acre-feet per year during 1997-1999). Reclamation continues to pursue other means to acquire the use of water for supplementing streamflow.

Bureau of Reclamation and
U.S. Army,
Corps of Engineers -
Upper Rio Grande Basin Water
Operations Review Environmental
Impact Statement
(EIS) (ongoing)

The Corps and Reclamation, in partnership with the State of New Mexico, will review water storage and delivery operations and may modify operations of federal river and reservoir facilities within the Upper Rio Grande Basin and develop an integrated plan. There is a need for updated NEPA and ESA compliance and a need to define procedures and protocols for review, coordination, consultation, and public involvement in water operations decisions. The NOI has been published and public scoping meetings are scheduled to begin in 2000. A decision document is currently scheduled for 2003. There will be intensive coordination with the City of Albuquerque's projects.

Bureau of Reclamation - Low Flow Conveyance Channel and Rio Grande Floodway EIS (ongoing)	Reclamation is preparing an EIS to reevaluate the operation and configuration of the Low Flow Conveyance Channel and Rio Grande floodway between San Acacia Diversion Dam and Elephant Butte Reservoir. A draft EIS is scheduled for 2000.
City of Santa Fe - Water Management and Restoration Strategy EIS (planned)	Reclamation is the lead federal agency for an EIS that will encompass the City of Santa Fe's strategy to use its contracted San Juan-Chama Project water, wastewater, and existing well fields in an integrated manner to meet potable and non-potable needs. This EIS is scheduled to begin in 2000.
U.S. Army, Corps of Engineers - San Acacia Levee Project (ongoing)	The Corps of Engineers recently distributed a draft supplemental EIS/limited reevaluation report and it is currently undergoing public review. The Corps previously received a jeopardy biological opinion from the USFWS for potential effects of the project on the Rio Grande silvery minnow and the Southwestern willow flycatcher. This levee rehabilitation project on the east bank of the Rio Grande extends from the San Acacia diversion dam to just north of the Tiffany Area above the San Marcial railroad bridge. The project will rehabilitate the existing spoil bank levee to withstand higher and longer-duration floods, relocate and increase the flow capacity of the San Marcial railroad bridge, and reintroduce the Tiffany area to the active floodplain. The project will allow for the safe release of higher flows from upstream flood control reservoirs. Currently, the San Marcial railroad bridge is restricting higher spring releases from upstream reservoirs. Raising the bridge would increase the potential to pass higher peak flows, and may result in better channel dynamics and healthier riparian community.
U.S. Army, Corps of Engineers - Belen Levee Project (ongoing)	The Corps of Engineers distributed a draft supplemental EIS/limited reevaluation report for public review in the spring of 1999. This levee rehabilitation project extends from Isleta Pueblo to Belen, New Mexico, on both the east and west banks of the Rio Grande. The project would rehabilitate the existing spoil bank levee to withstand higher and longer duration floods, and would allow for the safe release of higher flow from upstream flood control reservoirs. Portions of this spoil bank levee are the next limitation (after the San Marcial railroad bridge) to higher spring releases from upstream reservoirs.
Agricultural water use (ongoing)	Ongoing non-federal actions that are important to water resources include the ongoing agricultural use of water in the Rio Chama and middle Rio Grande valleys. Surface water is diverted directly from the Rio Chama and main stem Rio Grande for application on farmlands. A portion of the water returns to the river via wasteways from irrigation drains. However, below San Acacia Diversion Dam, all irrigation return flows are collected in irrigation drains and the Low Flow Conveyance Channel and delivered to Elephant Butte Reservoir. This project could benefit social considerations and economic factors by improving efficiency of water delivery, improving biological values and recreational opportunities, precluding land subsidence, protecting riverside features, protecting areas beyond levees, and draining agricultural fields.

Source: Robertson, 1998; CH2M Hill, 1997c

TABLE E-2
DETERMINATION OF POTENTIAL CUMULATIVE EFFECTS
OF PLANNED AND ONGOING PROJECTS
IN THE RIO GRANDE BASIN ON ENVIRONMENTAL RESOURCES

Resource: Ground Water Sustainability

- City of Albuquerque existing water supply system
- Implementation of a drought reserve (reduced ground water use)

Resource: Surface Water Quantity

- City of Albuquerque proposed water reclamation projects (reduced stream flow)
- City Drinking Water Supply Project (use of 48,200 ac-ft/yr. of San Juan-Chama water and ceasing to supplement surface flows with ground water)
- Agricultural water use (no change anticipated, although there could be future forbearance or change of use from agriculture to municipal/industrial)
- City of Santa Fe project (potential for less stream flow; Santa Fe will use 5,600 ac-ft/yr. of San Juan-Chama water)
- Low flow project (could be more efficient conveyance to Elephant Butte; could be a more open floodplain and higher losses)
- Reclamation's river maintenance program (maintains efficient transport)
- Corps' levee projects (maintains safe transport of flood flows)
- Upper Rio Grande Basin Water Operations Review EIS (better coordinated operations and improved efficiencies)

Resource: Surface Water Quality

- Reclamation's river maintenance program (some short-term increase in turbidity)
- Reclamation's low-flow conveyance channel EIS (sediment will be managed differently)
- Agriculture water use (return flows from agriculture fields will continue to affect water quality)
- Upstream discharges
- AWRSI projects and ongoing actions

- Corps and Reclamation's basin operations review (if operations are modified, there could be changes in water quality)

Resource: Biological Resources

- AWRSI projects and ongoing actions (flow depletions downstream of the City's water reclamation plant and below drinking water project diversion)
- Upper Rio Grande Basin Water Operations Review EIS (higher peak flows and coordinated operations could benefit riverine and riparian habitats)
- Reclamation's low-flow conveyance channel EIS (channel dynamics and the riparian community)
- Corps' San Acacia levee project (channel dynamics and the riparian community)

Resource: Social Considerations and Economic Factors

- AWRSI projects (improving biological values/recreational opportunities, precluding land subsidence)
- Reclamation's river maintenance program (improving efficiency of water delivery, protecting riverside features, protecting areas beyond levees, sediment transport and draining agricultural fields)
- City of Santa Fe project (improving biological values and recreational opportunities, precluding land subsidence)
- Corps' San Acacia levee and Belen levee projects (improving efficiency of water delivery, protecting riverside features, protecting areas beyond levees, and draining agricultural fields)
- Reclamation's river maintenance program (improving biological values and recreational opportunities)
- Corps' San Acacia levee and Belen levee projects (improving biological values and recreational opportunities)

APPENDIX F
CONSULTATION LETTERS – INDIAN TRUST ASSETS

APPENDIX G
CONSULTATION LETTER – ENDANGERED SPECIES ACT,
SECTION 7

APPENDIX H
DRAFT FISH AND WILDLIFE COORDINATION ACT REPORT
FOR NON-POTABLE WATER RECLAMATION AND REUSE,
NORTHEAST HEIGHTS AND SOUTHEAST ALBUQUERQUE

APPENDIX I
CULTURAL RESOURCES COORDINATION

APPENDIX J
PUBLIC AND AGENCY COMMENT LETTERS ON THE
DRAFT ENVIRONMENTAL ASSESSMENT

Note: This appendix will be completed during preparation of the final EA.

**APPENDIX K
RESPONSES TO PUBLIC AND AGENCY COMMENT LETTERS ON
THE DRAFT ENVIRONMENTAL ASSESSMENT**

Note: This appendix will be completed during preparation of the final EA.

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**TABLE 2.1-1
SUMMARY OF ENVIRONMENTAL EVALUATION CRITERIA AND
COMPARISON OF ALTERNATIVES**

Evaluation Criteria	Alternative	
	Proposed Action	No Action
Water		
1. Number of existing surface water and ground water uses that would be impaired by using reclaimed water.	0	0
2. Number of water quality parameters exceeding State ground water concentration standards.	0	0
3. Number of water rights holders in the Middle Rio Grande whose access to water or water use activities are restricted by project construction and operation.	0	0
4. Percent reduction in overbank flooding potential.	0	0
Biological Resources		
1. Total number of federal-listed species that are adversely affected.	0	0
2. Total number of State-listed species that are adversely affected.	0	0
3. Total number of designated critical habitat areas that are adversely affected.	0	0
4. Total acres of designated critical habitat degraded or lost.	0	0
5. Total acres of potential Southwestern willow flycatcher habitat permanently lost as a result of project construction or operation.	0	0
6. Total number of wetland areas adversely affected by construction.	0	0
7. Number of known raptor nest sites lost because of construction.	0	0
8. Number of known bald eagle nest sites lost or disturbed because of construction.	0	0
9. Acres of potential bald eagle forage area lost or disturbed because of construction.	0	0
10. Acres of jurisdictional herbaceous wetlands that would be lost due to ground water elevation drawdown of 1.5 feet or more below the existing average ground water depth for a period of at least one month during the growing season.	0	0
11. Acres of jurisdictional herbaceous wetlands that would experience substantial changes in overall community plant structural composition resulting from a ground water decline of 1 foot or more for at least one month due to ground water elevation drawdown.	0	0
12. Acres of jurisdictional woody wetlands that would be lost due to ground water elevation drawdown of 3 feet or more below the existing average ground water depth for a period of at least one month during the growing season.	0	0
13. Acres of jurisdictional woody wetlands that would experience substantial changes in overall plant structural composition resulting from a ground water elevation drawdown of 1–3 feet for at least one	0	0

Evaluation Criteria	Alternative	
	Proposed Action	No Action
month due to ground water elevation drawdown.		
14. Acres of non-jurisdictional herbaceous wetlands that would be lost due to ground water elevation drawdown of 1.5 feet or more below the existing average ground water depth for at least one month during the growing season.	0	0
15. Acres of non-jurisdictional herbaceous wetlands that would experience substantial changes in overall plant structural composition resulting from a ground water elevation drawdown of 1 foot or more below the existing average ground water depth for at least one month during the growing season.	0	0
16. Number of jurisdictional herbaceous wetlands that would be lost due to ground water elevation drawdown of 1.5 feet or more below the existing average ground water depth for a period of at least one month during the growing season.	0	0
17. Number of jurisdictional herbaceous wetlands that would experience substantial changes in overall community plant structural composition resulting from a ground water decline of 1 foot or more for at least one month due to ground water elevation drawdown.	0	0
18. Number of jurisdictional woody wetlands that would be lost due to ground water elevation drawdown of 3 feet or more below the existing average ground water depth for a period of at least one month during the growing season.	0	0
19. Number of jurisdictional woody wetlands that would experience substantial changes in overall plant structural composition resulting from a ground water elevation drawdown of 1 to 3 feet for at least one month due to ground water elevation drawdown.	0	0
20. Number of non-jurisdictional herbaceous wetlands that would be lost due to ground water elevation drawdown of 1.5 feet or more below the existing average ground water depth for at least one month during the growing season.	0	0
21. Number of non-jurisdictional herbaceous wetlands that would experience substantial changes in overall plant structural composition resulting from a ground water elevation drawdown of 1 foot or more below the existing average ground water depth for at least one month during the growing season.	0	0
Aesthetics and Visual Resources		
1. Approximate percent of tank perimeter within 10 feet of ground's surface that would not be screened by vegetation or barrier treatments.	0	0
2. Approximate percent of tank perimeter within 10 feet of ground's surface that would allow unrestricted access and potential for vandalism.	0	0
3. Number of facilities that would be located in a sensitive viewshed or viewing area.	0	0

Evaluation Criteria	Alternative	
	Proposed Action	No Action
Traffic and Circulation		
1. Number of street segments where anticipated traffic delays would exceed City requirements.	0	0
Soils and Vegetation		
1. Water quality parameters in irrigation water that would have an adverse effect on plant growth.	0	0
2. Acres of land that would not be suitable for irrigation.	0	0
3. Number of plant species that would experience toxic effects resulting from irrigation with the reclaimed water.	0	0
Cultural Resources		
1. Number of potentially-eligible cultural resources sites or traditional cultural properties likely to be affected by project construction and operation..	0	0
Socioeconomic Factors		
1. Number of businesses or commercial operations along the pipeline route that would require relocation or closing.	0	0
Noise and Vibration		
1. Number of expected cases when construction activities would exceed City vibration standards.	0	0
2. Number of expected cases when operation activities would exceed City vibration standards.	0	0
3. Number of expected cases when construction activities would exceed City noise standards.	0	0
4. Number of expected cases when operation activities would exceed City noise standards.	0	0
Human Health and Safety		
1. Number of cross-connections likely to be implemented during construction activities.	0	0
2. Number of reclaimed water quality parameters that would exceed primary drinking water quality standards.	0	0
Indian Trust Assets, Cultural Resources and Tribal Health and Safety		
1. Number of tribal individuals potentially exposed to unhealthful or unsafe conditions by project construction and operation.	0	0
2. Number of listed and identified cultural resources or traditional cultural properties likely to be affected by project construction and operation.	0	0
3. Isleta Pueblo water quality standards likely to be exceeded by project operations	0	0
Air Quality		

Evaluation Criteria	Alternative	
	Proposed Action	No Action
1. Number of federal air quality parameters likely to be exceeded by construction activities.	0	0
2. Number of state air quality parameters likely to be exceeded by construction activities.	0	0
3. Number of air quality parameters that would likely exceed non-attainment thresholds.	0	0
Environmental Justice		
1. Number of identified minority or low-income communities disproportionately affected by project implementation.	0	0
Recreation		
1. Number of playing fields to which access or uses are affected by project construction.	0	0
Land Use		
1. Number of areas that require a change in existing land use(s) or zoning.	0	0
2. Number of acres that require a change in existing land use(s) or zoning.	0	0
3. Total acres of prime or unique farmland adversely affected.	0	0
Total Least Change (number of designations)	2	30
Total Most Change (number of designations)	30	2
Relative Rank (1 = preferred) ^{d/}	2	1

a/ A negative loss is the same effect as a gain. This convention was used to allow an equivalent comparison with other evaluation criteria that track adverse changes. The larger the negative number, the greater the benefit or gain

b/ alternative responsible for least change for the evaluation criteria

c/ alternative responsible for most change for the evaluation criteria

d/ ranking based on environmental evaluation only; see text