

DRAFT ENVIRONMENTAL INFORMATION DOCUMENT

Business Core Wastewater Collection System for The Village of Corrales, New Mexico



Submitted to:

The Village of Corrales



and

The New Mexico Environment Department - Construction Programs Bureau

August 2008



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Draft Environmental Information Document Business Core Wastewater Collection System

**Village of Corrales
Corrales, New Mexico**

August 2008

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1.0 PURPOSE AND NEED OF PROJECT

1.1 Project Description

The purpose of the project is to install a wastewater collection system along an approximate 15,100 linear foot portion of NM-448 (aka Corrales Road) from the intersection of Old Church Road southwards to Calle Cuervo Road in the Village of Corrales, New Mexico. The proposed wastewater collection system will be installed within the right-of-way (ROW) of NM-448. Wastewater collection system options being considered include a single 6-inch diameter, a single 8-inch diameter and twin 6-inch diameter wastewater collection mains. The project will provide a wastewater collection system for the primary business district in Corrales, (aka Business Core) which includes approximately 45 businesses. The Village of Corrales currently relies on septic systems and leachfields for wastewater treatment and disposal, with the exception of several small wastewater package treatment units and holding tanks that must be frequently pumped and hauled to other municipal treatment plants. The New Mexico Environment Department (NMED) has published the statement in 2005, "Septic tank effluents have adversely impacted groundwater quality in the Village of Corrales". The installation of the Business Core wastewater collection system will help to improve and sustain groundwater quality in the Village of Corrales.

The businesses and residences located along the Corrales Road Business Core will connect to the wastewater collection main by utilizing lateral connections installed to existing septic tanks. A septic tank filter would be required to be installed in existing septic tanks. An effluent pump would also be required for existing septic tanks and would be installed between the septic tank and the existing leachfield. The septic tank effluent pump will provide the pressure required to charge the low pressure wastewater collection main and transport septic tank effluent to a down gradient lift station located just south of the Village of Corrales boundaries. This low pressure wastewater collection main, also known for this application as a Septic Tank Effluent Pump (STEP) system will be connected at the end point of construction to the City of Albuquerque/Bernalillo County Water Utility Authority (ABCWUA) lift station located on east side of NM-448 at the intersection of Calle Cuervo Road and Corrales Road. The wastewater project will extend the lateral connections from the STEP collection main to the apparent edge of the NMDOT NM-448 ROW. Business and homeowners fronting Corrales Road within the Business Core area will be required to install the septic tank filters, effluent pumps, and lateral connection piping to the edge of the NMDOT ROW. Flow meters may also be required to be installed by businesses and homeowners.

The STEP system will be installed using directional boring techniques which will minimize the impact to the subsurface, traffic, adjacent structures, existing utilities, and access to businesses. Since the project will be constructed using relatively small diameter piping (6 to 8-inch diameter for the collection main and 1.5 to 2-inch diameter for lateral services), the directional boring machines utilized will be approximately the size of a large pick-up truck. The preliminary design for the project includes the use of high density polyethylene piping (HDPE), which is flexible, strong and chemically resistant. The HDPE piping will be placed in the directional borings in 40-

foot or longer lengths and fusion welded. The directional borings will be constructed in approximate 750-foot lengths, with a staging area required at either end of each pipe run.

The primary impacts to the subsurface will be the staging areas, which are anticipated to be approximately 20-feet long, by 4-feet wide and 4-feet deep (80 square feet). NMDOT requires the wastewater collection main to be installed at a depth of four feet below grade and requires the low pressure collection main to be cased wherever it passes underneath NM-448 paving. The anticipated area of potential effect (APE) for the wastewater collection force main will be approximately 1,610 square feet or 0.036 acres. The APE associated with the lateral service connections (assumed to be 50 connections at 80 square feet each) is anticipated to be approximately 4,000 square feet, or 0.09 acres. A series of air relief valves and pipe cleanouts will be required and will be placed in traffic rated vaults, or manholes. The number of cleanouts and air relief valves will not be determined until final design is completed, but anticipated to be approximately ten locations. The disturbed area associated with the air relief valve vaults is anticipated to be approximately 80 square feet each, or a total of 800 square feet (0.018 acres). The total disturbed area (APE) associated with the project is anticipated to be approximately 0.17 acres.

A Preliminary Engineering Report (PER) was prepared by the Larkin Group in multiple stages during 2005 to 2007 which described various alternatives to meet the wastewater needs of the Village of Corrales. Souder, Miller & Associates (SMA) prepared a Peer Review Report in January 2008 that reviewed and updated the PER prepared in 2007. The PER and Peer Review Report described various alternatives for wastewater collection, treatment and disposal for the Village of Corrales. The scope of the PER and Peer Review Report also included an inspection and assessment of the existing wastewater collection system, existing on-site wastewater systems, environmental resources present within the project area, growth area and population trends. The Peer Review Report also identified areas of groundwater contamination within the Village and divided the Village into sectors of highest to lowest needs with schedules for implementation of wastewater collection or use of advanced treatment systems. The Business Core was identified as a sector of high needs.

This report addresses the Environmental Information Document (EID) portion of the scope of work pursuant to the New Mexico Environment Department - Construction Programs Bureau (NMED-CPB) State Environmental Review Process document dated 1/2/08. The EID is prepared in part to comply with the requirements of the National Environmental Policy Act (NEPA). To fulfill the requirements of NEPA, NMED-CPB is required to prepare a written assessment that describe the affected environment and environmental consequences of a proposed project; reasonable or practicable alternatives to the proposed project; and any mitigation measures necessary to avoid or minimize adverse environmental effects.

1.2 Purpose and Need of Project

1.2.1 Current Wastewater System

The Village is primarily comprised of conventional septic tank wastewater treatment systems for domestic wastewater. According to NMED Liquid Waste Program personnel, there are a few

residential advanced treatment units (ATUs) in the Village. Some septic tanks for businesses and the municipality are periodically pumped rather than discharged to a leachfield. There are three current commercial wastewater treatments systems in the Village that use non-septic tank types of treatment systems. Information on these systems is available from discharge permits listed in the NMED database. Information regarding these three systems is shown in the following table.

Table 1: Current Commercial Non-Septic Tank Treatment Systems in Corrales

Name	NMED Discharge Permit No.	Permitted Daily Flow (gpd)	Type of Treatment System
APS-Corrales Elem. School	1099	13,300	Constructed wetlands
Pueblo Los Cerros	131	20,000	Extended aeration
Village Pizza	1159	5,000	Constructed wetlands

All existing wastewater facilities in the Village process domestic wastewater. There are no known commercial or industrial wastewater facilities in the community.

There are no municipal water systems in the Village. There are less than 20 small public water systems that serve municipal facilities or businesses.

Location Map

There is no municipal wastewater system in the Village. The majority of the households and businesses have a conventional septic tank system, unless noted above. A location map is not provided as there is no municipal system.

History

The Village was first settled in the early 1700's. Agriculture has been a mainstay for hundreds of years. The Village was incorporated in 1971. There are no municipal water or wastewater facilities provided by the Village. Wastewater systems in the Village are primarily comprised of individually owned and operated residential and commercial conventional septic tank systems with leachfields. There are a number of leachfield mound systems constructed on the east side of Corrales Road, due to high groundwater and poorly draining soils. NMED and Village members also report a number of cesspools in the Village but the total number and extent is unknown. It is assumed that any cesspool would be located in areas of the Village developed prior to 1973 as that is the year regulatory requirements were put in place preventing future installation of cesspools.

Condition of Facilities

The NMED Liquid Waste Program reports that there are a number of problems with the existing septic tanks in the Village. NMED receives a number of calls regarding the location of septic tanks and the failure of leachfield systems. Since a number of the calls involve the location of an individual's septic tank, NMED suspects a number of Village members do not pump out their septic tanks on a regular basis.

Financial Status of Existing Facilities

This is no existing municipal wastewater system. Funds for wastewater planning and future design and construction have been received from the EPA and State of New Mexico legislative appropriations, and Sandoval County. These funds (\$958,200, \$200,000 and \$750,000, respectively) total approximately \$1,908,200. There is currently a matching fund of \$1,041,800 required for the EPA grant that is required to be provided by the Village. This match amount may be met with additional funding sources obtained by the Village. The total funding amount for this project is currently at \$2,950,000.

Annual Operations and Maintenance Costs

There is no municipal wastewater system. The Village does operate several conventional septic tank systems for municipal offices, a library and a recreational facility. These systems and the costs to operate them were addressed in the PER prepared by Larkin.

Users

There is no municipal wastewater system. The Village operates several conventional septic tank systems for municipal offices, a library and a recreational facility.

Financial Income and Expenses

There is no income from municipal utilities as they are not provided by the Village.

Existing Debts and Reserve Accounts

SMA is not aware of any existing debts or reserve accounts for future municipal utilities.

1.2.2 Health, Sanitation and Security

Health, Sanitation, and Security

Reports and data collection concerning potential impacts of septic systems to the groundwater in the Village area have been generated over the past 20 years. Groundwater samples collected and analyzed in this period of time have shown sporadic impacts to groundwater from septic tank discharges. These impacts have not been able to be confirmed for any given period of time. These impacts have been documented as follows:

- Nitrate level exceeding the EPA and NMED standard of 10 mg/L in 5 percent of the 137 wells sampled (NMED 1994 Water Fair)
- Nitrate level exceeding 5 ppm (a previously suggested target level for nitrate) in 17% of the 137 wells sampled (NMED 1994 Water Fair)
- Nitrate levels exceeding 2 ppm (NMED assumes a concentration of 2 ppm nitrate in groundwater to be naturally occurring, or “background” concentration) in 24 wells widespread across the Village on the west side of Loma Larga Road (*Ground-Water Quality in Corrales*, NMED, December 6, 2005)

- Substantial concentrations of iron (greater than Secondary drinking water quality standard of 0.3 ppm) widespread across the Village in 14 wells on the east side of Loma Larga Road (*Ground-Water Quality in Corrales*, NMED, December 6, 2005)
- NMED reported anoxic conditions having occurred in Corrales in one public groundwater well and 79 residential groundwater wells and in part are attributed to septic tank discharges (*Onsite Sewage Management in New Mexico*, NMED Liquid Waste Program, October 11, 2006)

NMED has published the statement “Septic tank effluents have adversely impacted ground-water quality in the Village of Corrales (*Ground-Water Quality in Corrales, Middle Rio Grande Basin, New Mexico*, NMED Interim Progress Report, December 6, 2005).

Measured groundwater impacts over the years have been widespread across the Village and have not been typically concentrated in any given areas, although there appears to be some correlation between the number of occurrences and the density of housing. There also appears to be a correlation with depth to groundwater.

The Village implemented a voluntary well sampling and testing program in 2006. A total of 140 wells, 4.6 percent of the estimated 3,000 wells in the Village, were sampled and analyzed. Results of the voluntary testing of 140 private wells did not indicate any exceedences of maximum contaminant levels (MCLs) for primary drinking water quality standards, however, there were significant concentrations of nitrates (> 2ppm background) detected in 12 of the samples. There were numerous exceedences of non-regulated secondary maximum contaminant levels (SMCLs) for iron and manganese. The analytical suite during the 2006 program did not include Total Kjeldahl Nitrogen (TKN). TKN is analyzed to determine the amount of organic nitrogen present and is used to determine the presence of wastewater contaminants in groundwater. TKN can oxidize to nitrate, a regulated primary groundwater standard contaminate, in the presence of oxygen. Anoxic conditions can prevent this process from occurring. The results of the 2006 sampling event are summarized in the following table.

Table 2: Summary of 2006 Village Voluntary Groundwater Sampling Event

Primary Drinking Water Standard	Contaminant	MCL (ppm)	No. Samples NO ₃ -N > 5 ppm	No. Samples NO ₃ -N > 2 ppm ≤ 5ppm
	Nitrate as Nitrogen (NO ₃ -N)	10	1 (0.7%)	11 (7.8%)
Secondary Drinking Water Standard	Contaminant	SMCL (ppm)	No. Samples > SMCL	---
	Iron (Fe)	0.3	18 (12.9%)	---
	Manganese (Mn)	0.05	75 (53.6%)	---

The results of the Village 2006 voluntary groundwater sampling event mimics past voluntary groundwater sampling events in that there are a number of samples that exhibit nitrate concentrations above the established background target levels of 2 ppm. There are also a significant number of samples that exceed the SMCL for iron and manganese, which are indicative of anoxic conditions. Anoxic conditions can prevent the oxidation of organic nitrogen to nitrate.

The Village has again implemented the voluntary well sampling and testing program for 2007 but data has not been provided as of the date of this report. SMA provided recommendations to the Village prior to implementing the 2007 program. One recommendation was for analyzing TKN in the samples. The Village has implemented this recommendation for this current sampling program. A better indication of the potential levels of organic nitrogen in anoxic zones is expected.

Most of the groundwater data, either historic, or currently being collected, has been on a voluntary basis. Sporadic sampling of wells throughout the Village does not enable the creation of a consistent analysis baseline. The estimated cost to provide such a baseline is provided below. SMA believes it is also important to note that it would also be very difficult and expensive to consistently measure the impact of individual septic tanks to the large aquifer that exists beneath the Village. It is not prudent for the Village to wait until consistent and defined groundwater impacts can be substantiated from a voluntary sampling program. If such an event would occur it would likely be classified as an emergency and substantial costs would be incurred. Such an event would also prompt regulatory action by NMED.

In the event the Village were to implement a comprehensive groundwater monitoring program, it is estimated that approximately 300 shallow monitoring wells would be required to monitor the upper aquifer, assuming approximately one well per 20 acres across the Village. Well depth would vary depending on depth to water, but would average 25 feet. Additionally, it would be necessary to monitor groundwater most likely being used for domestic supply. It is projected that 30 deep wells would be needed, assuming one well per 200 acres across the Village. Deeper wells are projected to be completed to a depth of 200 feet. Given a projected cost of \$750 per well for shallow wells and \$5,000 per well for deeper wells, total well construction cost would be approximately \$375,000.

Following well installation, it would be necessary to determine baseline groundwater conditions for each well. This would entail quarterly monitoring of groundwater for a minimum of four consecutive quarters. Common parameters used to determine impact from domestic wastewater include nitrate (as nitrogen), TKN, chloride, and total dissolved solids (TDS), at a minimum. Cost to monitor each well for this parameter suite, including field work, sample analysis, and a brief letter report of results would be approximately \$100,000 per sampling event, or \$400,000 to determine baseline conditions. Following determination of baseline conditions, wells would likely be monitored annually, with associated costs. The estimated total cost to implement a Village-wide groundwater monitoring program for a sampling period of one

year is \$775,000. Each subsequent year of monitoring would cost \$100,000 (annual sampling) to \$400,000 (quarterly sampling).

The inability for data to provide consistent results is believed to be one of the major reasons why some community members do not believe any action is required.

There are currently 16 active small public water systems within the Village. These public systems are required by NMED Drinking Water Bureau (DWB) to periodically collect and analyze drinking water samples from their wells. A review of this information indicates a number of these systems have been in violation for not sampling their wells or have violated regulatory standards for coliforms, however, there have been no reported coliform MCL violations for fecal coliform or E. coli. It was also noted that three systems reported nitrate concentrations of 0.05 ppm to 0.43 ppm in 2006 and these same systems reported nitrate concentrations in 2007 of 1.84 ppm to 4.14 ppm. This is a significant increase in concentration (order of magnitude) of nitrate in a short period of time.

There appears to be a consistent trend in the Village for septic tank problems and installation of new groundwater wells, which may be related. NMED Liquid Waste Program personnel indicated they are in Corrales on an almost daily basis. They receive numerous calls on septic tank backups and surfacing wastewater from leachfields. In some cases NMED said residents overload their septic system. NMED also suspects some septic systems discharge to the Rio Grande. NMED also said that the Rio Grande is expected to be classified in the near future as an impaired water body due to nutrient loading. If this occurs, NMED will have regulatory authorization to prevent uncontrolled wastewater discharges to the Rio Grande.

Rodgers & Company, an Albuquerque well driller, has indicated that they keep a drilling crew busy almost full time in Corrales. This indicates a number of wells needing repairs, being drilled deeper, or being replaced. SMA suspects that existing septic tanks may have some effect on this level of activity as there is not the level of new construction to require this level of need.

NMED Liquid Waste Program personnel indicated that the Office of the State Engineer (OSE) may soon expand the required separation of well and septic tank from 100 feet to 150 feet. NMED Liquid Waste Program has also published a report that suggests 0.75-acre (the current minimum lot size required) may not be large enough for a conventional septic tank system. These likely forthcoming regulatory changes support the concern of regulatory agencies regarding septic tank systems, and ultimately, the need for the project.

The need for a system was discussed with Mr. Bart Faris, NMED Groundwater Quality Bureau, Albuquerque. Mr. Faris has been involved with previous NMED data collection, synopsis, and reports for the Village and indicated there is a need for more advanced wastewater treatment in the Village even though groundwater quality standards have not been exceeded for a given period of time.

SMA contacted the NMED DWB Albuquerque office and discussed drinking water in the Village with Mr. Damian Luna, E.I.T. Mr. Luna is responsible for oversight of public water systems in

Corrales. Mr. Luna stated that he was not aware of any exceedences of MCLs for public water systems in the Village, as noted previously above. NMED DWB does not have regulatory responsibility for private wells.

SMA spoke with Ms. Jane DeRose-Bamman, NMED Surface Water Quality Bureau Monitoring & Assessment Section Manager to discuss recent sampling information for the Middle Rio Grande. Ms. DeRose-Bamman indicated that the 2005-2006 sampling results for the Middle Rio Grande are still being compiled but expected to be available in the next several months and a report is expected to be published by June 2008. Ms. DeRose-Bamman also indicated that there are potential nutrient and E. coli concerns in the Middle Rio Grande and that new discharge requirements, including total maximum daily loads (TMDLs), may be forthcoming.

SMA studied the Village hydrogeology and aquifer impacts. This information was used to prepare a hydrogeologic report for the Village. The general conclusions of this report are:

- The aquifer underlying the Village is highly transmissive
- Clay layers that exists at depth beneath the Village are discontinuous and do not prevent contaminants from entering lower levels in the aquifer
- Aquifer impacts from septic tanks have occurred
- Based on a groundwater model of the Village, septic tank contaminants (total nitrogen) above MCLs (total nitrogen >10 ppm) from a single leachfield have the potential to migrate as much as 100 feet down-gradient in two years.

Based on the same groundwater model, multiple septic tank leachfields on two-acre lot spacing can cause additive effects which impact large areas and may impact groundwater to depths of greater than 100 feet.

2.0 ALTERNATIVES TO THE PROPOSED ACTION

In addition to the proposed action in the PER, the following alternatives were considered for Village of Corrales wastewater collection project. The wastewater treatment system project includes wastewater collection system and transmission system alternatives.

2.1 No Action Alternative

The No Action Alternative would mean that the proposed Village of Corrales wastewater collection would not be constructed. The Village of Corrales would continue to rely on on-site septic tank and leach field systems for wastewater treatment. The No Action Alternative would result in continued and growing impacts to the aquifer because of the increased population causing increased loading from septic systems and leachfield effluent. The No Action Alternative could also restrict the potential for commercial growth in the Corrales Business Core due to restrictive wastewater flow volumes from septic tanks that limits the size of businesses and which can also cause increased development costs.

2.2 Collection System Alternatives

2.2.1 Alternative No. 1 - Corrales Road (NM-448) STEP System

Sector A – Business Core

A 50,000 gpd minimum STEP collection system would be designed for use by the Business Core and would be connected to the ABCWUA (currently New Mexico Utilities, Inc.) lift station located at Calle de Cuervo (see Figure 2). Future connections by areas outside of the Business Core may occur. The 6-inch STEP collection main would be installed within the Corrales Road ROW. It is proposed to install the STEP system outside of the asphalt pavement. NMDOT will require a traffic control permit and approval of the design plans by NMDOT will be required. The collection main would be installed at a depth of 4 feet below grade as required by NMDOT, and would follow the natural topography to the ABCWUA lift station. One-inch to 2-inch HDPE connections (sized by individual lot flow) to the collection main would be provided at each property in the Business Core from Old Church Road to Meadowlark Lane. The force main would then continue south along the west side Corrales Road until approximately the intersection of Cabezon Road. At this point, the force main would be routed to the east side of Corrales Road and then south approximately 350 feet to the ABCWUA lift station. Valves, cleanouts and combination air valves should be installed along the length of the collection main. Gate valves and flow meters would be provided at each connection point, as required. The collection main and property laterals would be installed using HDPE pipe and directional drilling technology. Approximately 15,100 linear feet of HDPE force main would be installed using this alternative. This methodology would minimize construction impacts to businesses and the Village.

Each residence or business connecting to the STEP collection system desiring to utilize the existing septic tank will be required to install a septic tank effluent filter and provide a septic tank effluent pump. In addition, each connection to the wastewater collection system will be required to install electrical service for an effluent pump, connection from the effluent pump to the

wastewater service connection at the edge of the property, and maybe required to also install a flow meter.

In lieu of the septic tank, a grinder pump will be required; however, the use of grinder pumps should be limited in number in order to minimize potential O&M issues from collecting an appreciable amount of solids. The pumping system will be installed in between the existing septic tank and leachfield. Individual, or shared, pumps will pump effluent to the collection main. Piping from the pump to the connection tap, located at Corrales Road ROW, will be provided by property owners. Pumps will be required to operate at a minimum of 60 psi, unless otherwise determined during the design phase. Pumps at the northern end of the system may be required to operate at a higher pressure in order to compensate for friction loss in the collection main. The system design would provide pump pressure requirements for all property owners.

The wastewater collection system will be installed using directional boring techniques which will minimize the impact to the subsurface, traffic, and access to businesses. Since the project will be constructed using relatively small diameter piping (6 to 8-inch diameter for the force main and 1.5 to 2-inch diameter for lateral services), the directional boring machines will be about the size of a large pick-up truck. The preliminary design for the project includes high density polyethylene piping (HDPE) which is flexible, strong and chemically resistant. The HDPE piping will be placed in the directional borings in 40-foot (minimum) lengths and fusion welded. The directional borings will be constructed in approximate 750-foot lengths, with a staging area required at either end of each pipe run.

The primary impacts to the subsurface will be the staging areas, each of which are anticipated to be approximately 20-feet long, by 4-feet wide and 4-feet deep (80 square feet). Preliminary conceptual design for the wastewater collection main will be installed at an approximate depth of four feet below grade. A series of air relief and possibly pressure sustaining valves and pipe cleanouts will be required and will be placed in traffic rated vaults, or manholes. The number of cleanouts and air relief valves will not be determined until final design is completed. The following table summarizes the APE which is estimated at approximately 0.17 acres for the project.

Table 3 - Estimated Area of Potential Effect for the Corrales Road Collection System

Project Area	Assumptions	Estimated Acreage
Business Core Collection System Force Main - 8,000 Linear Feet	4 foot x 20 foot staging area every 750 feet (~11 locations)	880 ft ²
Business Core Collection System Lateral Service Connections - 800 Linear Feet	4 foot x 20 foot staging area at 50 locations	4000 ft ²
Business Core Collection System - air relief valve, pressure sustaining valves and cleanout vaults	4 foot x 20 foot staging area at 10 locations	800 ft ²
Estimated Area of Potential Effect (APE)		5,680 ft ² or 0.130 acres

The system would be required to be designed in accordance with ABCWUA standards if ABCWUA takes ownership at the completion of construction. If ABCWUA owns and operates the system, they would be responsible for O&M of the collection system as well as billing customers. SMA contacted Mark Sanchez, ABCWUA Executive Director, to discuss this project. Mr. Sanchez indicated that ABCWUA has always considered that the Village would tie into their wastewater system and that ABCWUA was ready and willing for that to occur. Mr. Sanchez has also offered a reduced bulk rate connection cost for wastewater collection should the Village decide to own and operate the system.

Continued septic tank use by property owners would require pumping a minimum of every 4 years. Documentation of this should be provided to the Village. The Village should monitor these events as part of a proposed wastewater management program.

2.3 Wastewater Transmission System Alternatives

The proposed project includes the approximate 8,000 down gradient linear foot (LF) STEP Collection System within the Business Core on Corrales Road and three transmission system alternatives; Corrales Road Transmission System, Corrales Lateral Transmission System and the Upper Corrales Riverside Drain Transmission System. The proposed collection system and transmission system alternatives are depicted in Figure 1. A series of photographs are included in Appendix G which illustrates the typical environment of the project alternatives.

2.3.1 Alternative No. 1 - Corrales Road (NM-448) Transmission System Force Main

The Corrales Road Transmission System will consist of approximately 7,100 LF of 6 to 8-inch diameter HDPE pipe placed within the ROW of Corrales Road within the NMDOT right-of-way between Meadowlark Lane and the ABCWUA lift station located at Calle Cuervo Road (See Figure 1). The APE of the Corrales Road Alternative is estimated at 0.036 acres and is summarized below.

Table 4 - Estimated Area of Potential Effect for the Corrales Road Transmission System

Project Area	Assumptions	Estimated Acreage
Corrales Road Transmission System - 7,100 Linear Feet	4 foot x 20 foot staging area every 750 feet (~10 locations)	800 ft ²
Corrales Road Transmission System - air relief valve, pressure sustaining valves and cleanout vaults	4 foot x 20 foot staging area at 10 locations	800 ft ²
Estimated Area of Potential Effect (APE)		1,600 ft ² or 0.036 acres

The Corrales Road Transmission System Alternative is the preferred transmission system alternative for the project. The primary reason that the Corrales Road Transmission System is the preferred alternative is that it is the shortest distance, approximately 3,460 feet less than the Corrales Lateral Transmission Alternative and approximately 3,777 feet less than the Corrales Upper Riverside Drain Transmission Alternative. The shorter distance represents approximately 67% of the distance that the Corrales Drain Alternative would require, and 65% of the distance

that the Corrales Upper Riverside Drain Alternative would require. Roughly, this equates to a 33% to 35% cost savings in piping, directional boring, valves and other appurtenances required for the project.

Additionally, selection of the Corrales Road Transmission System alternative alleviates the impacts to the recreational use of the MRGCD ditch roads during construction activities along the Corrales Lateral and the Upper Corrales Riverside Drain alternatives. Many Corrales residents utilize the MRGCD ditch roads for jogging, horseback riding, bicycling and walking. Although the effects to the ditch roads would be limited in duration, many residents may be in opposition to the constriction efforts along the ditch road. During conversations with representatives of the MRGCD, SMA understands that the MRGCD conducts routine maintenance activities along the ditch roads including grading, vegetative clearing and ditch cleaning and dredging. The presence of manholes, air relief valves and isolation valves could present obstacles to the MRGCD maintenance staff, and some of these items could be damaged during routine ditch road maintenance.

The selection of the Corrales Road Transmission System alternative will also require a NMDOT right-of-way construction permit. Typically, obtaining a NMDOT right-of-way permit will be an easier alternative than obtaining an easement through the MRGCD administered lands.

2.3.2 Alternative No. 2 - Corrales Lateral Transmission System Force Main

The Corrales Lateral Transmission System alternative would include approximately 10,560 LF of 6 to 8-inch diameter HDPE piping that would be placed along the east side of the Corrales Lateral irrigation ditch between West Meadowlark Lane and Calle Cuervo Road. A portion of this alternative includes piping installation along the north side of West Meadowlark Lane between Corrales Road and the Corrales Lateral (See Figure 1). The table below summarizes the APE for the alternative.

Table 5 - Estimated Area of Potential Effect for the Corrales Lateral Transmission System

Project Area	Assumptions	Estimated Acreage
Corrales Lateral Transmission System - 10,560 Linear Feet	4 foot x 20 foot staging area every 750 feet (~14 locations)	1120 ft ²
Corrales Lateral Transmission System - air relief valve, pressure sustaining valves and cleanout vaults	4 foot x 20 foot staging area at 12 locations	960 ft ²
Estimated Area of Potential Effect (APE)		2,080 ft ² or 0.048 acres

Completion of the Corrales Lateral Transmission System Lateral would require obtaining an easement through the MRGCD administered lands. Completion of this alternative would also temporarily disrupt recreational activities along the Corrales Lateral, although the disturbance would be primarily at the staging areas located along either end of each direction bore. Completion of the directional boring could in some instances affect mature Cottonwood tree root systems in several locations; although this effect is considered to be minor, based on the relatively small diameter of the direction bore. Completion of this alternative would also allow close coordination with MRGCD staff to avoid damage to transmission system components

during ditch and ditch road maintenance activities. MRGCD staff have also expressed concerns in the unlikely event of a transmission system leak, and the potential impacts to the MRGCD ditches and access roads during leak repair efforts. The MRGCD has concerns regarding a breach of the ditch system during a pipeline repair.

2.3.3 Alternative No. 3 - Corrales Upper Riverside Drain Transmission System Force Main

The Upper Corrales Riverside Drain Transmission System: approximately 10,877 LF of 6 to 8-inch diameter HDPE piping would be placed along the west side of the Upper Corrales Riverside Drain between East Meadowlark Lane and Calle Cuervo Road. A portion of the pipeline would be placed along East Meadowlark Lane between Corrales Road and Andrews Drive. The piping would then proceed south along the Andrews Drive Drain to the intersection of the Andrews Drive Drain and the Upper Corrales Riverside Drain. The piping would then be placed along the east side of the Upper Corrales Riverside Drain to Cabezon Road, where the pipe line would be routed several hundred feet along the east side of Corrales Road to the ABCWUA lift station (See Figure 1).

Table 6 - Estimated Area of Potential Effect for the Upper Corrales Riverside Drain Transmission System

Project Area	Assumptions	Estimated Acreage
Corrales Upper Riverside Drain Transmission System - 10,877 Linear Feet	4 foot x 20 foot staging area every 750 feet (~15 locations)	1200 ft ²
Corrales Upper Riverside Drain Transmission System - air relief valve, pressure sustaining valves and cleanout vaults	4 foot x 20 foot staging area at 12 locations	960 ft ²
Estimated Area of Potential Effect (APE)		2,160 ft ² or 0.05 acres

Completion of the Upper Corrales Riverside Drain Transmission System Lateral would require obtaining an easement through the MRGCD administered lands. Completion of this alternative would also temporarily disrupt recreational activities along the Upper Corrales Riverside Drain, although the disturbance would be primarily at the staging areas located along either end of each directional bore. Completion of the directional boring in some instances could affect mature Cottonwood tree root systems in several locations; although this effect is considered to be minor, and not permanently damaging, based on the relatively small diameter of the directional bore. Completion of this alternative would require close coordination with MRGCD staff to avoid damage to system components during ditch and ditch road maintenance activities. MRGCD staff also expressed concerns of a transmission system leak, although highly unlikely due to the benefits of using HDPE piping, and the potential impacts to the MRGCD ditches and access roads during any leak repair efforts. The MRGCD has concerns regarding a breach of the ditch system during a pipeline repair.

Both the Corrales lateral ditch and the Upper Corrales Riverside Drain are under the jurisdiction of the Middle Rio Grande Conservancy District (MRGCD) and the Bureau of Reclamation.

3.0 AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

3.1 Environmental Setting

The project area is located in Corrales, New Mexico, which is located on the west bank of the Rio Grande at an average elevation of approximately 5,000 feet above mean sea level. The Village of Corrales is approximately 6,000 acres in size, with approximately 1,500 acres utilized for agricultural purposes. Livestock, including horses, llamas, goats and other animals are kept at a number of properties within the Village. The community is separated along a north-south axis by Corrales Road (NM-448), and several irrigation and drainage canals. Topography in the Village is relatively flat along the Rio Grande floodplain, and generally slopes from north to south and west to east. The Bosque (a natural cottonwood gallery forest) and the adjacent Rio Grande forms the eastern boundary of the Village. The Village of Rio Rancho is the adjacent community to the west. Land use in the Village is primarily residential, with some light commercial and agricultural use. The average residential lot size is between 1 and 2 acres, although much smaller lot sizes exist.

The Village's commercial zoning district (Business Core), part of which is located along Corrales Road is home to several restaurants, a service station, artist studios, bed and breakfasts, feed store, veterinary practice, professional offices, medical offices and other businesses. Based on the 2000 census and a growth extrapolation, the population of the Village of Corrales was estimated at approximately 8,000 in 2005, with a projected population increase to 11,000 by the year 2025.

Surface water bodies are present in the Corrales area, and water supplies are exclusively supplied by groundwater extraction. Wastewater is currently treated by on-site septic tanks and leach fields. Several commercial businesses utilize small package units for wastewater treatment.

The climate of the Corrales area is mild with an average annual precipitation of 8.7 inches and an average minimum temperature of 37 degrees Fahrenheit, and a maximum average temperature of 69.8 degrees Fahrenheit, and a means average of 53.4 degrees.

The project area is located within a subsection of the Albuquerque Basin of central New Mexico. The Albuquerque Basin is one a long line of basins designated as the Rio Grande rift. The alluvial floor of the Rio Grande Valley has been aggrading for many centuries with the result that many historical ground surfaces are buried. The geological media in this area is comprised of Quaternary alluvium, terrace and pediment gravels, and sand, silt and gravel deposits.

3.2 Land Use

3.2.1 General Land Use

The general land use in the Business Core and the location of the STEP Wastewater Collection System and the Corrales Road Transmission System Alternative of the Villages of Corrales is primarily urban commercial, with approximately businesses located along Corrales Road.

Additional businesses are located along Loma Larga Road and other streets adjacent to Corrales Road. Many residential properties are located in the streets adjacent to Corrales Road. Additionally, many properties along the periphery of the Business Core district are utilized for agricultural purposes including small orchards, livestock grazing, gardens and open space. The Corrales Business Core is bisected by Corrales Road, which is a two-lane paved street that experiences relatively high traffic volumes. Since Corrales Road has no turn lanes, traffic is frequently congested as traffic enters and exits Corrales Road. Land ownership, with the exception of the Village of Corrales offices and community center, are privately owned.

The properties within 300 feet of the center line of Corrales Road from Old Church Road in the north to Meadowlark Lane in the south are designated as the Business Core; and zoned as commercial properties. There are also properties located within the Business Core that are currently used for residential purposes.

Land use along the Corrales Lateral Transmission Main Alternative is primarily residential and privately owned, and the Corrales Lateral ditch and access roads are administered by the Middle Rio Grande Conservancy District (MRGCD). The access roads along MRGCD Corrales Lateral ditch are frequently used by Corrales residents for jogging, walking and horseback riding. The eastern and western edges of the MRGCD Corrales Lateral access roads are covered with Fremont cottonwood, Siberian elm and occasional Russian olive trees, and salt cedar.

Land use along the Upper Corrales Riverside Drain Transmission Main Alternative is similar to the Corrales Lateral land use. The access roads along MRGCD Corrales Lateral ditch are frequently used by Corrales residents for jogging, walking and horseback riding. The Upper Corrales Riverside drain forms the western boundary to the 400-acre Corrales Bosque Preserve, which forms the western bank and floodplain of the Rio Grande.

No population will be displaced as result of the proposed action. Likewise, the character of the area affected by the wastewater collection system will not be altered. There will some temporary effects and disturbance related to the construction of the project, but these effects will be temporary. No long-term effects to general land use are anticipated as result of the project.

3.2.2 Growth and Population Trends

As of the census of 2000, there were 7,334 people, 2,819 households, and 2,122 families residing in the Village. The population density was 683.7 people per square mile. There were 2,983 housing units at an average density of 278.1 per square mile. The racial makeup of the Village was 86.05% White, 0.57% African-American, 1.51% Native American, 0.79% Asian, 0.03% Pacifica Islander, 8.22% from other races and 2.82% from two or more races. Hispanic or Latino of any race were 25.55% of the population.

There were 2,819 households out of which 32.5% had children under the age of 18 living with them, 65.4% were married couples living together, 7.1% had a female householder with no husband present, and 24.7% were non-families. 18.1% of all households were made up of

individuals and 4.7% had someone living alone who was 65 years of age or older. The average household size was 2.60 and the average family size was 2.97.

The Village population is diverse with 24.6% under the age of 18, 4.8% from 18 to 24, 25.9% from 25 to 44, 34.2% from 45 to 64, and 10.5% who were 65 years of age or older. The median age was 42 years. For every 100 females there were 93.5 males. For every 100 females age 18 and over, there were 90.2 males.

The median income for a household in the Village was \$67,217, and the median income for a family was \$79,331. Males had a median income of \$52,397 versus \$34,091 for females. The per capita income for the Village was \$33,629. About 3.1% of families and 5.0% of the population were below the poverty level, including 7.8% of those under age 18 and 1.8% of those age 65 or over.

Potential growth in the Village for the 20-year planning period was discussed in the 2007 PER. In summary, there is a current estimated population of 8,000 in the Village as of 2005 with a projected population increase to 11,000 by year 2025. Based on the estimated population of 8,000 in 2005, this is a growth of 3,000 people in 20 years, or 150 people per year. The median household size is 2.6 people per household (2000 U.S. Census). Considering the median household size, the growth projection is equivalent to 57 new houses, and septic tanks, per year. This is a projected 38 percent increase in septic tanks in 20 years, or approximately 2 percent per year.

According to the Village Planner, there is approximately 1,500 acres of land in Corrales that can be developed as one-acre lots. The Farmland Preservation initiative in Corrales has set aside 19 acres of land and has an additional 50 acres of land under consideration. If all 69 acres are put into preservation, this leaves 1,431 acres available for potential development. Using the median household size, an additional 1,431 one-acre lots results in an additional 1,431 septic tanks and 3,721 people. This further confirms the potential growth projection shown in the 2007 PER and the need for the project shown in the SMA 2008 Peer Review Report.

The proposed project is expected to promote some commercial growth within the Business Core in the Village of Corrales, since the wastewater collection system will provide an alternative to the existing on-site wastewater septic tank systems, which in some instances has prohibited commercial development. Many properties within the Business Core are already developed, with few remaining undeveloped parcels. Additionally, the proposed wastewater collection system will be installed in an area of Corrales that is already built out without significant tracts of vacant undeveloped land. Some limited growth could occur if properties currently utilized for residential use are converted to commercial use. There will be some impact to properties currently used for residential purposes fronting Corrales Road within the Business Core as they will be required to connect to the wastewater collection system. Significant additional growth outside of the Business Core is not anticipated as a result of installation of the wastewater collection system.

No mitigation measures are required as a result of the proposed project and the effect upon the present and future population.

3.2.3 Important Farmland

The Village has been a farming area since the Spanish colonial period and prehistoric sites indicate that the area has been occupied since at least 500 A.D. Over time as the Albuquerque urban area has expanded, the Village has changed from a farming community to a rural, residential community with some farming. Some properties in the Village are zoned “agricultural and rural residential,” which can be used for raising crops, livestock, and fowl.

According to the New Mexico Land Conservancy (NMLC), the Village established a Farmland Preservation Program in 2000 “to preserve and protect the farmland, open space and viewsheds,” and preserving “the agricultural, scenic and open character of Corrales through the acquisition of conservation easements on important farmland within the Village.” According to the Village Planner, there are 19 acres in the preservation program and another 50 acres under consideration. The proposed wastewater project(s) will not affect any designated farmland and will likely not take place on agricultural land.

A conservation easement is a voluntary legal agreement between the landowner and a government agency or private conservation organization. A conservation easement ensures protection of agriculture resources today and into the future. The restrictions on the property can cover the entire property or portions of the property. Conservation easements provide tax incentives to farmers to protect their land. However, conservation easements require a qualified conservation organization or public agency to monitor and enforce the restrictions. The Rio Grande Agricultural Land Trust (RGALT) is a nonprofit 5 land trust that helps protect the rich agricultural land in the Rio Grande Valley.

Preservation of agricultural land in the Middle Rio Grande region using this method is already underway. In September of 2004, the Village of Corrales approved the sale of \$2.5 million in bonds committed to preserving farmland and open space. This bond is partnered with a \$1.1 million grant from the U.S. Department of Agriculture, and will be used to acquire conservation easements from property owners. Corrales citizens now have the option to sell the development rights to the Village instead of a developer. The landowner would maintain ownership of the property, while the property would be preserved exclusively for agricultural or open space uses.

Agricultural land may be categorized as prime and unique or as of statewide and local importance. The Natural Resources Conservation Service (NRCS), which has jurisdiction over farmlands, defines prime or unique farmlands as those lands whose value is derived from their general advantage as cropland due to soil and water conditions. Farmlands deemed of statewide importance are important to agriculture but exhibit some properties that exclude them from the prime farmland classification.

SMA contacted the NRCS to obtain information regarding designated farmland parcels within the project vicinity, was informed that no prime farmlands or unique farmlands have been designated in the Corrales area by the NRCS.

Agricultural activities within the project area include gardens, livestock grazing, alfalfa farming and orchards. Farmland is not present within the project APE.

The proposed project will not have an effect on important farmland.

No mitigation measures associated with farmlands area required for the project.

3.2.4 Soils

As stated in the 2007 PER, there are a number of soil types within the project area. A soil survey map from U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) is provided in Appendix B. The majority of the soil in the area is classified as loam, with varying proportions of sand, silt, and clay. It is important to note that even though the soil survey map indicates loamy soils, there are a number of areas within Corrales that have experienced problems with septic tank leachfields. This may be attributed in part to poorly draining soils. This is confirmed by a USDA NRCS soils map for septic tank conditions (see Appendix B) which shows much of the Village to be “very limited” for septic tank drainage due to slow water movement through soils. The soils in the area are used for rangeland, livestock grazing, irrigated cropland and pasture, and urban development.

The proposed project should not increase erosion rates or promote soil loss, since the total APE is estimated at 0.17 acres. A Stormwater Pollution Prevention Plan (SWPPP) is required under 40 CFR §122 for construction activities that result in a total land disturbance of 1 acre or greater, and where those discharges enter the surface waters of the United States. Soil excavated during implementation of the directional boring staging areas will be placed carefully around the excavation and a berm will be constructed to minimize migration of soil from the staging areas. Silt fences and Best Management Practices (BMPs) will be implemented as part of the general construction practices during the project to minimize off site migration of soils. Based on the relatively flat gradient at the proposed staging areas, the potential for soil migration off site is minimal.

No mitigation measures associated with soils are required for the project other than implementation of BMPs during construction activities. If the project design changes significantly, and anticipated total land disturbance exceeds 1 acre, then a SWPPP will be required for the project.

3.2.5 Formally Classified Lands

Formally classified lands include national parks, landmarks, wild and scenic rivers, grasslands, state parks and Native American owned lands.

The 400-acre Corrales Bosque Preserve was previously owned by the Nature Conservancy and was recently transferred to the Village of Corrales. This 7.8 mile riverside preserve offers the best-known example of middle Rio Grande broadleaf deciduous forest. The Corrales Riverside Preserve also provides habitat for more than 180 species of migrating and nesting birds. The Upper Corrales Riverside Drain transmission line alternative would be installed along the access road for the Middle Rio Grande Conservancy District right-of-way, which borders the Corrales Nature Preserve.

There are no designated Wilderness areas in the vicinity of Corrales. The Sandia Mountain Wilderness, a part of the Cibola National Forest is located approximately 10 miles east of Corrales in the Sandia Mountains. SMA received correspondence from the National Park Service dated May 19, 2006 indicating that the proposed project will not have an effect upon any parks.

The proposed project will not have an effect upon formally classified lands.

No formally classified lands are present within the project area. No mitigation measures are required in regards to formally classified lands.

3.3 Floodplains

Based on review of Federal Emergency Management Agency (FEMA) Flood Rate Insurance Maps (FIRM) found in Appendix C, SMA understands that a majority of the land east of the Corrales Acequia are designated as being within river flood hazard areas, and in areas with a 1% or greater annual shallow flooding risk. Depths of the flooding based on the FIRM maps in the project area typically vary between 1 and 2 feet. Significant development, including residential and commercial development, has already occurred in these areas. Several irrigation ditches (acequias) in the Village help provide flood control.

Impacts to the project in the event of a flood are not considered to be detrimental, since the wastewater collection and transmission mains will be located underground, and will still function as designed. If a significant flooding event occurs during construction activities, then temporary dewatering operation may be required, depending upon flood duration, intensity and soil infiltration capacity.

The local floodplain administrator responded on May 28, 2008 and had no comment that the proposed wastewater collection system project

3.4 Wetlands

As stated in the 2007 PER, wetlands are present along the Rio Grande, east of the project area. The presence of freshwater emergent wetlands and riverine wetlands were identified based on review of the U.S. Fish and Wildlife Service (USFWS) wetlands mapped area. According to the USFWS Wetlands Online Mapper, four small wetlands are identified within the Village of Corrales (see map provided in Appendix D). The project area was not part of the U.S. Fish and

Wildlife Service (USFWS) wetlands mapped area. Additionally, no evidence of hydric soils, wetland vegetation or saturated areas was observed during the site reconnaissance.

The proposed project(s) will not affect any of the identified wetlands within the project area.

Accordingly, no mitigation measures are required for wetlands as part of the proposed project.

3.5 Water Resources

3.5.1 Surface Water

The Rio Grande is present east of the project area, as well as the Corrales Riverside Drain, the Corrales Acequia, the San Mateo Drain, the Nichols Drain, and the Corrales Interior Drain. Construction, implementation and operation of the proposed wastewater collection system will not adversely affect surface water.

SMA did consult with the U.S. Army Corps of Engineers (USACE) regarding wetlands and surface water. The USACE stated in a written response, dated May 14, if the project involves work in the waters of the United States, that a Section 404 permit may be required. Depending upon the alternative selected, a crossing of the Nichols Drain and possibly the San Mateo Drain may be required. In event of a water crossing, it is anticipated that a directional boring will be advanced beneath the waterway at a minimum depth of three feet, and the HDPE wastewater main will be placed within a secondary containment casing. Alternatively, a crossing at an existing bridge may negate the need to advance a directional boring beneath a waterway. The final need for a Section 404 permit will be determined after completion of the final design of the proposed project. SMA understands that the MRGCD conducts periodic dredging activities in the drains and acequias in the project vicinity, and that the wastewater transmission main will need to be installed at a depth sufficient to avoid being damaged during dredging and channel maintenance activities.

The U.S. Environmental Protection Agency (USEPA) requires National Pollutant Discharge Elimination System (NPDES) permit coverage for stormwater discharges from construction projects that will result in the disturbance of one or more acres of total land area. A Stormwater Pollution Prevention Plan (SWPPP) is required under 40 CFR §122 for construction activities that result in a total land disturbance of 1 acre or greater, and where those discharges enter the surface waters of the United States. Since the proposed project will only disturb approximately 0.17 acres, a SWPPP will not be required as part of the proposed project. However, the construction contract specifications will include Best Management Practices (BMPs) to reduce the potential for off-site migration of sediment into surface water. Additionally, equipment fueling operations will be conducted at locations away from surface water to minimize potential for spills. Construction equipment will not be parked in close proximity to surface water. Hazardous materials used in the construction process will be stored in a secure location away from surface water.

The NMED-Surface Water Quality Bureau (SWQB) was contacted as part of the project consultation process. The NMED-SWQB did mention the requirement for the Village and the

general contractor to obtain coverage under NPDES general permit for construction activities that disturb over 1 acre. Since the project is anticipated to only disturb approximately 0.17 acres, preparation of a SWPPP is not required.

The piping used to convey the wastewater will be constructed out of HDPE, a strong, flexible, thick-walled pipe that will be pressure tested prior to use. Sections of HDPE pipe are connected using a fusion welding process, which makes the connection stronger than the blank sections of pipe. In the unlikely event of a leak, the resulting loss of pressure could be identified by the wastewater operator. At points where the wastewater transmission main would cross surface water bodies, a secondary containment casing pipe would be placed around the pipe to prevent leaks from entering the surface water.

The proposed project will not have an effect upon surface water resources. Accordingly, no mitigation measures are required for surface waters, other than implementation of BMP's during construction activities. If the final system design results in a land disturbance greater than 1 acre, then a SWPPP will be required. The final need for a Section 404 permit will be determined after completion of the final design of the proposed project.

3.5.2 Groundwater

The Village of Corrales is located in the Middle Rio Grande Basin, a rift-related tectonic feature where crustal extension has caused large blocks of older sedimentary and igneous rocks to be down-dropped relative to the adjacent ground, forming a series of fault bounded basins. Through time, the basin has been filled by a thick package of sediments, including sediments associated with the ancestral and current Rio Grande.

Depths to groundwater vary across the Village of Corrales with depths exceeding 80 feet below grade along the higher elevation areas west of Loma Larga Road, to only 5 feet below grade for properties located along Corrales Road and closer to the Rio Grande.

Proximal to the Rio Grande, the Village of Corrales is underlain by the Los Palomas Formation, a 50 to 80 foot thick package of generally sandy to gravelly fluvial sediments of the Rio Grande. Underlying and interbedded with Las Palomas Formation are older fluvial sediments, which overly the Ceja Formation. The Ceja Formation is part of the upper Santa Fe Group, which are fluvial sediments associated with the ancestral Rio Grande. The upper Santa Fe Group is characterized by thinly interbedded sand, silt and clay, with local gravelly units. Sedimentary beds are generally discontinuous.

Sandy and gravelly zones within the Las Palomas Formation and upper Santa Fe Group are generally water-bearing in the Corrales area, and form outstanding aquifers. Older wells were completed in the shallow (less than 100 feet) Las Palomas formation. As this aquifer has been locally depleted and impacted by human activities, wells have been drilled into the deeper upper Santa Fe Group aquifer. Both the shallow and deeper aquifer zones are good producers, with well production of 50 to 100 gallons per minute from short screened intervals common.

Threats to water quality in the vicinity of the proposed project area include nitrates and anoxic conditions from septic systems. Construction of the wastewater collection system should reduce the nitrate loading in groundwater in the area because of decreased stress upon the aquifer. Detrimental effects upon groundwater as a result of implementation of the proposed project are not anticipated.

No mitigation measures are required to protect groundwater from the proposed project.

Completion of the proposed project should ultimately improve groundwater quality in the vicinity of the Village of Corrales Business Core, since decreased loading of nitrates will occur. Since the entire Village relies upon domestic wells for drinking water, completion of the proposed project should have a positive effect upon groundwater quality.

The New Mexico Office of the State Engineer (NMOSE) was contacted as part of the project consultation process. The NMOSE did not have any comment regarding the project.

The Albuquerque Bernalillo County Water Utility Authority (ABCWUA) was contacted during the project consultation process. The ABCWUA concurred with SMA's initial determination that the proposed project will not have a significant impact within the context of NEPA.

The NMED-Groundwater Quality Bureau (GWQB) was contacted regarding drinking water issues, but no response relative to drinking water was received.

3.6 Coastal Resources

Coastal resources are not present within the State of New Mexico. This section is included to meet the requirements of 40 FR 6.302(d) and (f).

3.7 Air Quality

Section 109 of the Clean Air Act (CAA) (42 U.S.C. 1857-18571, as amended by Public Law 91-604), requires that national primary and secondary ambient air quality standards be established. In New Mexico, the EPA has identified seven Air Quality Control Regions (AQCRs) and has approved, with some exceptions, New Mexico's plan for the attainment and maintenance of the national ambient air quality standards (NAAQS) in these interstate and intrastate regions. The State of New Mexico has also promulgated some ambient air quality standards that are more stringent than the NAAQS.

The Village of Corrales is considered to be in attainment for all New Mexico and National Ambient Air Quality Standards. Activities associated with project activities have the potential for a temporary increase in dust and emissions from construction equipment. However, these increases are expected to be minimal, since excavation activities will only be conducted at the staging areas, located on either end of each directional boring. The project activities will meet local regulations regarding noise and dust control.

The proposed project construction activities are not anticipated to have a detrimental effect on air quality, since the duration of the project is anticipated to be less than six months, and will only involve typical construction equipment. No significant emissions are expected as part of project activities.

No mitigation measures are anticipated for air quality generated as part of the proposed project.

3.8 Biological Resources

SMA conducted a biological evaluation of the proposed wastewater collection system project area (Appendix E). The project area for the proposed Corrales wastewater collection system project consists of commercial and residential development, roads, right-of-ways (ROWs), utility easements, private land, and Village of Corrales property. Additionally, the wastewater transmission system alternatives include property administered by the MRGCD.

The wastewater collection and transmission system will be constructed in areas that have been previously disturbed, such as along the edges of existing paved roads and bladed dirt and gravel roads, with many of these areas have buried utilities already present. A brief description of the species present within the project area is described below.

3.8.1 Vegetation

A SMA biologist conducted a pedestrian and vehicular biological survey of the project area on April 24 and April 25, 2008. Due to the urban nature of the project area, only limited vegetation was present. Over time, the project area has experienced many modifications in the vegetative community from construction of utilities, drainage and irrigation ditches, residential and commercial development, roadways and other infrastructure.

Original Corrales Area Vegetative Community

Remnants of the original vegetative community are present within the Corrales Bosque Preserve, a 400-acre tract of land formerly owned by the Nature Conservancy and recently transferred to the Village of Corrales. The vegetation within the Corrales Bosque Preserve consists of floodplain-riparian vegetation largely comprised of cottonwood gallery forest. The original gallery forests comprised of large cottonwood trees present along the floodplains of the Rio Grande were often close to historical settlements, and were often cut for fuel and for building materials. The historical riparian forests were also cleared to make land available for agriculture and urbanization. The management of overbank flooding from the installation of dams and other flood control structures within the last 100 years has reduced the ability of the native vegetation, particularly cottonwoods to reproduce. Additionally, the water table in some areas has lowered from river channel incision, which has impacted phreatophytic habitats. The lack of overbank flooding events as eliminated the silt layer that the cottonwoods rely on to supportive new vegetative growth from buried twig and branch nodes and sprouting from root systems.

As a result of the encroachment of man upon the riparian flood plains which comprises the Village of Corrales, dramatic growth of alien tree species has occurred, including Salt Cedar (tamarisk sp.), and Russian Olive (*Elaeagnus angustifolia*). The primary types of natural vegetation present along the floodplains of the Rio Grande include Fremont cottonwood (*Populus fremonti*), New Mexico olive (*Forestiera neomexicana*), Skunkbrush (*Rhus trilobata* Nutt.), Rabbitbrush (*Chrysothamnus spp.*), Sandbar willow (*Salix interior* Rowlee), Coyote willow (*Salix exigua*), Four wing saltbush (*Atriplex canescens*), Arizona grape (*Vitis arizonica*), Common cattail (*Typha latifolia*) and many other grasses, forbs and shrubs.

Project Area Vegetation

Vegetation observed during the field reconnaissance of the project area included species observed along the ditch banks of the Corrales Lateral and the Upper Corrales Riverside Drain and the edges of Corrales Road. A summary of the vegetation observed during the field reconnaissance is included within the Biological Survey Report in Appendix E. Vegetation observed included Russian thistle (*Salsola kali*), Chinese elm (*Ulmus parvifolia*), Tansy mustard (*descurainia pinnata*), Slender wheatgrass (*elymus trachycaulus*), Alfalfa (*medicago sativa*), White clover (*Trifolium repens*), Dandelion (*Taraxacum officinale*), Globe mallow (*Sphaeralcea ambigua*), Inland saltgrass (*Distichlis spicata*), Coyote willow (*Salix exigua*), Yellow salsify (*Tragopogon dubius*), Foxtail barley (*Hordeum jubatum*), Kochia (*Bassia prostrate*), Bamboo (*unknown species*), Cockle burr (*Xanthium strumarium*), Cheatgrass (*Bromus tectorum*), Pear tree (*Pyrus communis*), Rio Grande cottonwood (*Populus deltoids*), Narrow leaf cottonwood (*Populus angustifolia*), Hairy gold aster (*Heterotheca villosa*), and Threadleaf groundsel (*Senecio flaccidus*).

Non-Native/ Invasive Weeds

The New Mexico Department of Agriculture designated a number of invasive weed species as noxious and targeted these as species of control or eradication pursuant to the Noxious Weed Management Act of 1998. These are divided into Class A, Class B, and Class C weeds.

Class A weeds are species that currently are either not present in New Mexico or have limited distributions in the state. Prevention of invasion or spread of these species in the state is considered highest priority.

Class B weeds are species that already occur in limited portions of the state. In areas that are not currently infested these weeds are treated as Class A. In areas that are already severely infested these species are to be contained to stop further spread.

Class C weeds are species that are widespread in New Mexico. Since in some areas they are almost naturalized, management decisions for these species should be determined on a local level. These decisions are normally based on the feasibility of control and the level of infestation.

Three species of New Mexico Noxious Class C weeds were observed during the field reconnaissance, including Field bindweed (*Convolvulus arvensis*), Russian olive (*Elaeagnus angustifolia*) and Salt cedar (*Tamarisk sp.*).

In order to reduce the potential for spreading noxious weeds to the project area, construction equipment should be cleaned with herbicide. No other mitigation measures are required for noxious weeds.

Rare Plants

Based on review of the list of New Mexico Rare Plants provided by the New Mexico Rare Plant Technical Council (NMRPTC), a total of eleven rare plants species are present in Sandoval County. None of the rare plants listed for Sandoval County were listed as endangered. A list of the plants is provided below.

Table 7 - Rare Plants-Sandoval County

Common Name	Scientific Name	USFWS Status	Habitat Elevation	Potential Presence
Parish's alkali grass	<i>Pucinella parishii</i>	SoC	2,600-7,200 ft. Alkaline springs, seeps and seasonally wet areas at the head of drainages. Requires continuously damp soil during growing season.	Unlikely, since continuous alkali rich wet areas are not present within project area
Knight's milkvetch	<i>Astragalus knightii</i>	SoC	5,700-5,900 ft. Rimrock ledges of Dakota Formation. Conifer and pinon-juniper woodlands.	Suitable habitat not present since Dakota Formation not present in project area
Plank's campion (or Plank's catchfly)	<i>Silene plankii</i>	SoC	5,000-9,200 ft. Igneous cliffs and rocky outcrops, mountains near the Rio Grande.	Suitable habitat not present since cliffs and rocky outcrops not present in project area
Gypsum townsendii	<i>Townsendia gypsophilia</i>	SoC	5,700-7,400 ft. Gypsum outcrops and gypsiferous/pure gypsum soils. Great Basin conifer woodland	Suitable habitat not present since gypsum soils and outcrops not present in project area
Tufted sand verbena	<i>Abronia bigelovii</i>	SoC	5,700-7,400 ft. Gypsum or stongly gypsiferous soils	Suitable habitat not present since gypsum soils and outcrops are not present in project area
Santa Fe milkvetch	<i>Astragalus feensis</i>	SoC	5,100-6,000 ft. Sandy benches and gravelly hillsides, pinon-juniper woodland or plains/mesa grasslands	Suitable habitat not present

**Draft EID Business Core Wastewater Collection System
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Common Name	Scientific Name	USFWS Status	Habitat Elevation	Potential Presence
La Jolla prairie clover	<i>Dalea scariosa</i>	SoC	4,750-4,900 ft. Sandy clay banks and bluffs	Suitable habitat not present
Sapello Canyon larkspur	<i>Delphinium sapellonis</i>	SoC	8,000-11,500 ft. Canyon bottoms and aspen groves (in montane coniferous forests)	Suitable habitat not present since elevation of site below 8,000 ft.
Sandia alumroot	<i>Heuchera pulchella</i>	SoC	8,000-10,700 ft. Limestone cliffs	Suitable habitat not present since elevation of site below 8,000 ft. and limestone cliffs not present at site.
Springer's blazingstar	<i>Mentzelia springeri</i>	SoC	7,000-8,000 ft. Volcanic pumice and unconsolidated pyroclastic ash in piñon-juniper woodland and lower montane coniferous forest;	Suitable habitat not present since elevation of site below 7,000 ft.
Navajo Muhly	<i>Muchlenbergia arsenoi</i>	SoC	4,600-6,500 ft. On limestone outcrops in pinon and juniper woodland	Limestone outcrop not present at site.
Sivinki's scorpion weed	<i>Phacelia sivinskii</i>	SoC	5,900-6,450 ft. Gypsum from the Upper Jurassic Todilto Formation juniper/desert scrub communities.	Suitable habitat not present since elevation of project area is lower.

Notes: SoC = Species of Concern

No listed rare plants were observed during the site evaluation, and since the project area does not support rare plant habitat, no impacts to rare plants are anticipated as part of this project.

Short term impacts to the vegetative community in the project area are anticipated to be very minor. Some impacts to Cottonwood roots could occur in the Upper Corrales Riverside Riverside Drain and for the Corrales Lateral transmission main alternatives. However, these impacts are considered to be relatively minor, based on the proximity of mature trees close to the center line of the MRGCD access roads present along the Upper Riverside Drain and the Corrales Lateral. Some minor impacts to seasonal plants such as the Tansy mustard, Russian thistle, Dandelion and Globe mallow could occur, but will be limited the staging areas located at either end of each directional boring.

Long term impacts to the vegetative community are not anticipated, since the APE is such a small area, and primarily centralized at the staging areas. Completion of the preferred transmission system alternative along Corrales Road will present less potential for impacts to the vegetative community than the Corrales Lateral and the Upper Corrales Riverside Drain transmission system alternatives. In some locations, the tree roots from mature cottonwood

trees could be affected by the directional boring, although the effect would be considered minimal.

3.8.2 Wildlife and Habitat

Wildlife and threatened and endangered species within the State of New Mexico are managed by three agencies including the U.S. Fish and Wildlife Service (USFWS), under authority of the Endangered Species Act (ESA), the New Mexico Department of Game and Fish (NMDGF), under authority of the New Mexico Wildlife Conservation Act of 1974, and the New Mexico Energy, Minerals and Natural Resources Department, under authority of the New Mexico Endangered Plant Species Act. Protection from harassment, harm, or destruction of habitat is granted to species protected under the ESA. The New Mexico Wildlife Conservation Act and New Mexico Endangered Plant Species Act protect state listed species by prohibiting taking without proper permits.

The Rio Grande riparian forest environment contains many different mammals, amphibians, reptiles and birds. Refer to Appendix E for a listing of species typically found in the riparian forest that occur along the banks of the Rio Grande. Common mammals observed in the Bosque forest include spotted ground squirrel (*Spermophilus spilosoma*), rock squirrel (*Spermophilus variegatus*), black tailed jackrabbits (*Lepus californicus*), deer mouse (*Peromyscus maniculatus*), white-footed mouse (*Peromyscus leucopus*), muskrat (*Ondatra zibethicus*), yellow-faced pocket gopher (*Pappogeomys castanops*), American porcupine (*Erethizon dorsatum*), Coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), bobcat (*Lynx rufus*), and mule deer (*Odocoileus hemionus*).

Common amphibians observed along the Rio Grande include green toad (*Bufo dibilid*), western chorus frog (*Pseudacris triserita*), Northern leopard frog (*Rana pipiens*), painted turtle (*Chrysemys picta*), collared lizard (*Crotaphytus collaris*), common kingsnake (*Lampropeltis getula*), bullsnake (*Pituophis melanoleucus*), blackhead garter snake (*Thamnophis cyrtopsis*) and western rattlesnake (*Crotalus viridis*), and many other species.

The Bosque forest is home to over 180 species of birds, and is an important migratory pathway for many species. Common birds observed in the Bosque area include Great blue heron (*Ardea Herodias*), Snow goose (*Chen caerulescens*), Canada goose (*Branta Canadensis*), mallard (*Anas platyrhynchos*), Northern pintail (*Anas acuta*), Hooded merganser (*Mergus cuculatus*), American coot (*Fulica Americana*), Sandhill crane (*Grus canadensis*), Killdeer (*Charadrius vociferous*), Solitary sandpiper (*Tringa solitaria*), Turkey vulture (*Cathartes aura*), Bald eagle (*Haliaeetus leucocephalus*), Swainson's hawk (*Buteo swainsoni*), Red-tailed hawk (*Buteo jamicensis*), Ring-necked pheasant (*phasianus colchicus*), Gambel's quail (*Callipeple gambelli*), Mourning dove (*Zenaida macroura*), Greater Roadrunner (*Geococcyx californianus*), Great Horned owl (*Bubo virginianus*), Cliff swallow (*Hirundo pyrrhonota*), Brown towhee (*Pipilo maculates*) and many other species.

Prior to the site visits, extensive literature review was completed. A list of sensitive species in Sandoval County was compiled from the U.S. Fish and Wildlife Service web site. During the site visits none of the sensitive species were observed at or near the project site. Presence of a species was determined by visual observations, acoustic presence, scat, dens/nests, and tracks. Species that were observed are listed below:

Mole den, species unknown, location was the Corrales Riverside Drain.

Rock squirrel (*Spermophilus variegates*), location was throughout all sites.

Great Blue Heron (*Ardea herodias*) tracks, location was the Corrales Riverside Drain.

Mourning dove (*Zenaida macroura*), location was throughout all sites.

Roadrunner (*Geococcyx californianus*), location was on Corrales Road, across from Andrews Lane.

Red-tailed hawk (*Buteo jamaicensis*), observed flying west of all the sites.

Mallard (*Anas platyrhynchos*), male with female in ditch next to pump station adjacent to Corrales Road.

In addition to the above listed species there was evidence of a turtle in the canal. Frequently it was observed coming up for air but no identification could be made based on that alone. Several species of insects could be seen as well.

The selection of the preferred alternative for the Corrales Road transmission system would likely have less effect on wildlife than the implementation of either the Corrales Lateral or the Upper Corrales Riverside Drain transmission system alternatives. The staging areas would be equipped with escape ramps for wildlife in the event they were left open overnight, per NMDGF guidance.

3.8.3 Threatened and Endangered Species/Species of Concern

According to the U.S. Fish and Wildlife Service (USFWS), a total of six species are listed on the Sandoval County Endangered Species list. These species include the following:

Table 8 - Threatened and Endangered Species in Sandoval County

Common Name	Scientific Name	Species Group	Listing Status	Critical Habitat in Corrales Vicinity
Yellow-Billed Cuckoo	<i>Coccyzus americanus occidentalis</i>	Birds	Candidate	No
New Mexico meadow jumping mouse	<i>Zapus hudsonius luteus</i>	Mammals	Candidate	No
Black-footed ferret	<i>Mustela nigripes</i>	Mammals	Endangered	No
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Birds	Threatened	No
Rio Grande silvery minnow	<i>Hybognathus amarus</i>	Fishes	Endangered	Yes
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Birds	Endangered	No

Yellow-Billed Cuckoo

The yellow-billed cuckoo (*Coccyzus americanus occidentalis*) is a USFWS candidate species that occurs locally along the riparian corridors throughout New Mexico. Ideal habitat appears to be dominated by cottonwood canopy with a well developed understory (Bison, 2008). Yellow-billed cuckoos breed in riparian woodlands and similar habitats at lower (2800 - 5500 ft) to middle (5000 - 7500 ft) elevations. The western race of the yellow-billed cuckoo is associated with lowland deciduous woodlands, willow and alder thickets, second-growth woods, deserted farmlands, and orchards. No evidence of yellow-billed cuckoos was noted during the biological survey. Because the project site does not contain actual or potential habitat for the species, the proposed project will have no effect upon the breeding habitat and no direct effects to the species.

Mexican Spotted Owl

Habitat characteristics highly sought by Mexican spotted owls (*Strix occidentalis lucida*) include high canopy closure, high stand density, a multi-layered canopy, uneven-aged stands, numerous snags, and downed woody matter (Bison, 2008). These are best expressed in old-growth mixed-conifer forests (usually more than 200 years old). These characteristics may also develop in younger stands that are unmanaged or minimally managed, especially when the stands contain remnant large trees or patches of large trees from earlier stands. Primary spotted owl habitat consists of mixed conifer dominated by Douglas-fir, pine, or true fir and pine-oak forests. Secondarily selected habitats include such features as steep, narrow canyons with cliffs and a perennial water source. Such canyon habitats generally include conifer or riparian forests, or clumps of trees, but also may be sparsely vegetated. Areas chosen for their contiguous forests are strongly selected for old-growth forests or forests that have more complex structure than surrounding forests.

The project area does not support the type of habitat preferred by the Mexican spotted owls, since the owls prefer old growth mixed conifer forest, typically found at elevations over 4,000 feet higher than the project area. No short-term or long-term impacts are anticipated from the proposed project.

Rio Grande Silvery Minnow

The Rio Grande silvery minnow (*Hybognathus amarus*) occupies a variety of habitats in low-gradient, large streams with shifting sand or silty bottoms (Bison, 2008). The distribution and habitat recorded for specimens of this species do not indicate special requirements other than a flowing mainstream environment. The natural habitat for the Rio Grande Silvery Minnow includes stream margins, side channels, and off-channel pools where water velocities are lower than in the main river channel (USBOR, 2006). Favored areas are covered with detritus and algal-covered substrate. Stream channels dominated by straight, narrow, or incised channels with rapid flows would not typically be occupied by the Rio Grande silvery minnow.

No short-term or long term impacts to the Rio Grande Silvery Minnow or its habitat are anticipated to occur as a result of the proposed actions. The Rio Grande Silvery Minnow

prefers habitat that exhibits lower stream velocities and eddies; the potential ditch crossing points have typically higher velocity, and straight sections of ditch which are not considered Rio Grande Silvery Minnow habitat. Directional boring techniques will be used if a crossing of a ditch or drain is needed to complete the project. The directional boring can be elliptical in nature and a HDPE pipe can be utilized for the wastewater transmission main, and is flexible enough to be inserted below a ditch bottom without affecting the ditch invert elevation and will be placed deep enough to allow for periodic dredging that is routinely conducted by the MRGCD. Ditch bottoms and the Rio Grande Silvery Minnow habitat will not be affected by the proposed action.

New Mexico Jumping Mice

New Mexico Jumping mice (*Zapus hudsonius luteus*) are primarily associated with riparian habitats in New Mexico. Meadow jumping mice captures (in a study at Bosque del Apache) were often associated with a grass perennial forb community with at least 65% vegetative cover (Bison, 2008). They are usually found in marshes, moist meadows and riparian habitats in open prairie. The species in New Mexico characteristically occur in mesic habitats dominated by rank, herbaceous vegetation. In the Rio Grande Valley, Morrison (Bison, 2008) found that preferred habitat for the meadow jumping mouse contained permanent streams, moderate to high soil moisture, and dense and diverse streamside vegetation consisting of grasses, sedges, and forbs. Such habitats include the edges of permanent ditches and cattail stands in the Rio Grande Valley (Bison, 2008). The potential for Jumping Mouse habitat within the proposed project area is limited to the banks of the Upper Corrales Riverside Drain. Since the preferred alternative for the wastewater transmission main will be along Corrales Road between Meadowlark Land and the ABCWUA lift station, the potential for impact to the New Mexico Jumping Mouse and its habitat are remote.

Black-Footed Ferret

The distribution of the black-footed ferret (*Mustela nigripes*) is closely related with that of prairie dogs and most viable breeding populations have been associated with prairie dog colonies which they use for food and shelter (Bison, 2008). Prairie dog colonies are essential for black-footed ferret habitat. Based on ferret energy needs, prairie dog energy yields, population dynamics of both species and related factors, Stromberg et al. (Bison, 2008) calculated that a single female black-footed ferret and her litter would require a population of 474-1421 prairie dogs. Annual harvest from these populations would be 214 black-tailed and 186 white-tailed prairie dogs. In order to sustain the prey base, 91-235 acres of black-tailed and 212-877 acres of white-tailed prairie dogs would be needed at average prairie dog densities of 6.1/acre and 1.6/acre, respectively. Since no evidence of prairie dogs was noted during the biological survey of the project area, it is highly unlikely that black-footed ferret habitat is present within the project area. The proposed project will not have an effect upon black-footed ferret populations or its habitat.

Southwest Willow Flycatcher

The southwestern willow flycatcher (*Hybognathus amarus*) is considered endangered by both the USFWS and the state of New Mexico. The subspecies is typically found in dense riparian

vegetation along select waterways in New Mexico. The Southwestern willow flycatcher is an obligate riparian species and is found in close association with dense groves of willows, arrowweed, buttonbush, tamarisk, Russian olive, and some other riparian vegetation, often with a scattered overstory of cottonwood (USBOR, 2006). These riparian communities provide nesting and foraging habitat. The southwestern willow flycatcher has experienced extensive loss and modification of this habitat and is also endangered by other factors, including brood parasitism by the brown-headed cowbird (Bison, 2008).

Since the project area does not contain actual or potential habitat for the species, the proposed action will have no effect upon breeding habitat, and no short-term or long-term effects to the species. The preferred alternative for the wastewater transmission main will be along Corrales Road, which does not support the habitat necessary for the species.

Based on the findings of the Biological Evaluation, the proposed project is unlikely to affect threatened and endangered species.

The United States Department of the Interior, Fish and Wildlife Service provided a response to a request for comments on May 23, 2006 regarding impacts to threatened or endangered species or important wildlife habitats that may occur in the project area. They referenced sources of information on these issues, and regulatory requirements. They also suggested contacting the New Mexico Department of Game and Fish and the New Mexico Energy, Mineral and Natural Resources Department, Forestry Division for additional information.

The New Mexico Department of Game and Fish (NMGF) responded to SMA's request for information on May 28, 2008 regarding impacts to threatened or endangered species or critical habitat and indicated the project is unlikely to affect wildlife or wildlife habitats. Trenching and pipe backfilling will be conducted to minimize trapping of wildlife. Escape ramps will be provided for wildlife. Following completion of construction activities, disturbed areas will be reseeded with native vegetation to minimize erosion.

The New Mexico Energy, Mineral and Natural Resources Department, Forestry Division responded to SMA's request for information on May 10, 2008. They stated that they had no comment regarding the proposed project.

3.9 Archeological, Cultural and Historic Resources

A cultural resource survey was conducted by Mr. Steve Townsend with Townsend Archeological Consultants at the proposed wastewater collection and transmission system between April 25 and May 23, 2006. A copy of the survey is attached in Appendix F. The survey included a complete field inventory of the wastewater collection system and the three wastewater transmission system alternative locations and documentation of historic structures within 100 feet of the APE, including Corrales Road (NM-448). Since Corrales Road was previously inventoried entirely within the recent past, the New Mexico Department of Transportation did not require a cultural resources inventory of the right-of-way corridor within the project area. The

State of New Mexico Cultural Resource regulations required an inventory of the built environment and relocation of sites that were previously recorded.

The State of New Mexico Office of Cultural Affairs has designated the Village of Corrales as site number LA 5169. The records of the Archeological Records Management Section contain files that suggest that the existence of old foundations of Spanish Colonial structures. However, no spatial information is associated with the LA 5169, and therefore in the opinion of Steve Townsend has no management value. The reference to LA 5169 was therefore not included within the cultural resource report.

The cultural resource inventory resulted in the documentation of 1 isolated occurrence, 63 buildings, 1 previously recorded site, an Official State Highway Scenic Marker, portions of the Corrales Lateral, the Upper Corrales Riverside Drain, the Corrales Interior Drain and Cabezon Channel. The Nichols Lateral was documented as a part of the Upper Corrales Riverside Drain.

The isolated occurrence is of limited data potential and is not eligible for listing on the National Register of Historic Places. Of the 63 structures documented during the survey, 20 were eligible to the National Register under 36 CFR 60.4 (c) and 43 structures were considered ineligible for listing. The Corrales Lateral, the Upper Corrales Riverside Drain, and the Corrales Interior Drain are potentially eligible for listing under 36 CFR 60.4 (a) based on the expressions of a broad pattern in American History. However, these structures have been modernized in many locations and much of the original construction details have been obscured. The Cabezon Channel south of the Corrales Road crossing near the southern terminus of the project is considered to have been altered enough to have no remaining evidence of the original construction, and is therefore ineligible for listing. The Acequia Madre de Corrales (LA132552), has been cleaned and put into use since the previously recording, and is now potentially eligible for listing under 36 CFR 60.4 (a). The Official Scenic Highway Marker is recent and while of management consideration, is not considered a significant resource.

The landscape in the general vicinity of the Project Area included the areas along the Corrales Lateral, the Upper Corrales Riverside Drain, the Corrales Interior Drain and the Cabezon Channel are extensively used for recreational paths by walkers, joggers, horseback riders and bicyclists. These areas were significantly disturbed during the initial construction during the 1920's. Additionally, modern dredging and canal maintenance activities have resulted in vegetative clearing both with mechanical and chemical methods, and stockpiles of dredged materials bladed and reconfigured.

The Corrales Road area has been extensively urbanized with many driveways, fences, overhead and buried utilities, and residential and commercial development. Corrales Road is a highly congested road with almost constant high levels of traffic occurring during normal business hours.

Meadowlark Lane, being of a portion of the Corrales Drain transmission main alternative, has seen variable disturbance, mostly from utilities and driveway crossings. The eastern Meadowlark Lane is wider, with larger set-backs than the western Meadowlark Lane.

The linear land parcel designation originated by the Spanish Colonial and Mexican periods is reflected in current tax maps. Corrales has been affected by modernizing trends since the 1970s. The rapid growth of Rio Rancho to the west and north of Corrales has eroded the agrarian nature of the community. South of the Cabezon channel there has been recent urbanization, including the development of strip malls, subdivisions and apartments.

In the center of historic portion of the Village, gentrification has started altering the historic fabric of the community. North of Ella Street crossing on Corrales Road, there are several structures which formed the center of the original Village and are now the center of the Business Core. These structures include law offices, architects, psychologist and other professionals, computer businesses, clothing stores and restaurants. In some instances, reconstruction of the original, historic buildings has resulted in the removal of factors of integrity which result in those structures no longer being of consideration for listing to the National Register.

The results of the cultural resource survey included 20 structures that are considered eligible for the National Register. The recorded structures included the State Register of Cultural Properties listings HPD-1516, the Alejandro Gonzales House, and HPD-1858, the Martinez/Perea Hall.

The Alejandro Gonzales House (HPD-1516) is a vernacular hipped box house with three shed dormers and a basement. It belonged to Alejandro Gonzales, who was a local landowner and a member of the early Middle Rio Grande Conservancy District board. The house features 5/1 double hung windows, an internal brick chimney, a 3-light awning window, an inset porch on the southeast of the building, accessed by concrete stairs, though a fixed glass porch and single leaf glass door. There is a second enclosed porch on the southwest side of the house, likewise glazed with fixed windows. There is an eave and the rakes are exposed. The foundation of the structure cannot be seen.

Although the Alejandro Gonzales House is within 100 linear feet of the project area, it is sufficiently far enough away to not be impacted from implementation of the directional boring and subsequent pipe installation.

The Martinez/Perea Hall is one of the oldest remaining structures in Corrales. A flat-roofed New Mexico vernacular house with parapet, metal clad canales and vigas, this single story house has a sunken interior, wood casement and 1/1 double hung wood windows. The entrance on the south side of the building has a steel security door, but the door is single leaf. The main entrance from the east is a single leaf panel with fixed lights and a transom. The foundation cannot be seen. Originally classed as Territorial style, the pediments have been changed since 1981 and a double leaf casement window in the northeast of the building has been largely infilled and covered with Plexiglas. Previous pediments were elaborate and included Territorial

arches with beadrails and dentils, while the previous doors included both single and double leaf panels. There is non-contributing addition to the southwest, sharing a common wall.

Since the final design for the wastewater collection system is not yet completed, the exact location of the piping near the Martinez/Perea Hall is unknown. However, the final design will take the Martinez/Perea Hall into account, and care will be exercised to avoid impacting the structure. SMA understands that the State Historic Preservation Officer (SHPO) typically has concerns over the vibration effects from project activities. However, the vibration effects from traffic along Corrales Road will no doubt be much greater in magnitude than the effects of directional borings. Preferably, the wastewater collection main will be located on the east side of the road near the Martinez/Perea Hall.

In order to provide for protection of possible cultural resource materials during construction activities, the construction contract documents should include the following or similar language:

“In the event of a discovery [“discovery” means any previously unidentified or incorrectly identified cultural resources, including but not limited to, archaeological deposits, human remains, or locations reportedly associated with Native American religious/ traditional beliefs or practices], the Contractor must immediately cease all operations in the immediate vicinity of the discovery and notify the Engineer. The Contractor should be aware of his/her responsibilities under the Historic Preservation Act of 1966 and the Archeological Resources Protection Act of 1979.”

Upon notification of a discovery by the Contractor, the Engineer must immediately notify the New Mexico State Historic Preservation Office (NMSHPO), as well as other Native American groups that have requested notification (the Comanche Tribe, for example).

Other than the avoidance of the Martinez/Perea Hall, no mitigation measures are required for known cultural resources. In the event that unknown cultural resources are encountered during construction activities, construction activities in the area would stop, and appropriate treatment would be developed in consultation with NMSHPO.

As part of the Section 106 consultation process, SMA consulted with a total of 16 tribes including:

- Cochiti Pueblo
- Comanche Tribe
- Hopi Tribal Council
- Pueblo of Isleta
- Pueblo of Jemez
- Jicarilla Apache Nation
- Pueblo of Laguna
- Navajo Nation
- Ohkay Owingeh
- Pueblo of Zia
- Pueblo of San Felipe
- Pueblo of San Ildefonso
- Pueblo of Sandia
- Pueblo of Santa Ana
- Pueblo of Santa Clara
- Pueblo of Santo Domingo

Reponses from the tribal consultation are attached in Appendix G, and discussed in Section 5.2.

SMA submitted the Cultural Resource Survey for the project to the State Historic Preservation Office (SHPO) on July 15, 2008, including copies of tribal consultation letters and copies of tribal consultation responses. As of the date of this report, SMA has not received a response from the SHPO regarding the cultural resource survey report.

3.10 Socioeconomic/Environmental Justice

3.10.1 Socioeconomic Conditions

The community of Corrales is located within southern Sandoval County and according to the 2000 Census, the population was 7,334 people. The median household income in 1999 dollars was \$67,217, and 3.1% of the families live below the poverty level.

The population density was 683.7 people per square mile. There were 2,983 housing units at an average density of 278.1per square mile. The racial makeup of the Village was 86.05% White, 0.57% African-American, 1.51% Native American, 0.79% Asian, 0.03% Pacific Islander, 8.22% from other races and 2.82% from two or more races. Hispanic or Latino of any race were 25.55% of the population.

There were 2,819 households out of which 32.5% had children under the age of 18 living with them, 65.4% were married couples living together, 7.1% had a female householder with no husband present, and 24.7% were non-families. 18.1% of all households were made up of individuals and 4.7% had someone living alone who was 65 years of age or older. The average household size was 2.60 and the average family size was 2.97.

In the Village the population was spread out with 24.6% under the age of 18, 4.8% from 18 to 24, 25.9% from 25 to 44, 34.2% from 45 to 64, and 10.5% who were 65 years of age or older. The median age was 42 years. For every 100 females there were 93.5 males. For every 100 females age 18 and over, there were 90.2 males.

An initial one-time impact fee (UEC), based on estimated monthly flow, shown in the following table, is required for each connection by ABCWUA. As of the time of report publication, the Village of Corrales has not determined if the wastewater collection system will be operated by ABCWUA or the Village of Corrales. The current ABCWUA wastewater rate schedule for non-water users is also shown in the following table.

Table 9: ABCWUA Wastewater Rates for Non-Water Use Facilities

ABCWUA Wastewater Rates for Non-Water Customers							
Flow (CCF)	Flow (gallons)	Residential	Commercial	Industrial	Institutional	Multi-family	UEC
0 - 10	0 - 7,481	\$ 7.49	\$ 9.26	\$ 42.09	\$ 7.17	\$ 12.43	\$ 1,816
11 - 19	7,482 - 14,213	\$ 12.14	\$ 15.16	\$ 71.30	\$ 11.58	\$ 20.58	\$ 3,027
20 - 63	14,214 - 47,127	\$ 49.64	\$ 62.82	\$ 307.10	\$ 47.23	\$ 86.37	\$ 6,053
64 - 82	47,128 - 61,340	\$ 123.52	\$ 156.70	\$ 771.61	\$ 117.46	\$ 215.97	\$ 9,685
83 - 343	61,341 - 256,581	\$ 165.42	\$ 209.94	\$ 1,035.05	\$ 157.29	\$ 289.48	\$ 19,370
344 - 599	256,582 - 448,082	\$ 352.41	\$ 447.54	\$ 2,210.67	\$ 335.03	\$ 617.50	\$ 30,265
600 - 803	448,083 - 600,684	\$ 469.32	\$ 596.10	\$ 2,945.73	\$ 446.16	\$ 822.59	\$ 60,530
804 - over	600,685 - over	\$ 834.31	\$ 1,059.87	\$ 5,240.47	\$ 793.10	\$ 1,462.87	\$ 96,848

Notes: CCF - Commodity Charge Flow, one unit = 100 cubic ft.
UEC - Utility Expansion Charge

The proposed project is not anticipated to have a disproportionate effect upon low income families. The proposed project will actually be beneficial to low income families within the Business Core, since the cost of connection to the ABCWUA will be more cost effective than installation and long-term maintenance of septic and leachfield systems. No mitigation measures are required in reference to socioeconomic issues.

3.10.2 Environmental Justice

Federal agencies are required to identify and address disproportionately high and adverse human health or environmental effects of its activities on minority and low income populations under Executive Order 12898 (published in the Federal Register on February 11, 1994). Based on review of the U.S. EPA's Region 6 Environmental Justice Geographic Information Index Tool maps, several areas within the project area have economically stressed populations over 15%. However, this value is less than the New Mexico state average of 28.7%. These maps are included in Appendix H. However, the installation of the proposed wastewater treatment plant and associated collection and transmission systems should have a positive effect upon economically stressed populations, since less reliance upon on-site septic tanks and leach fields will be required, and possibly less expensive construction of new homes and businesses, since septic tanks and leachfield facilities will not need to be installed.

The proposed project was reviewed for compliance with Executive Order 12898 entitled "Federal Actions to Address Environmental Justice (EJ) in Minority and Low-Income Populations". Potential environmental impacts to economically stressed communities were evaluated using Geographical Information System maps, census demographic data, and a mathematical formula to rank the project for EJ impacts. The project will serve all populations equally and will be constructed in a manner to ensure that no persons or populations will be discriminated against or denied the benefits of the project because of their race, color, income level, or national origin. There will be no adverse impacts that are considered disproportionate to any particular population(s) based on ethnicity or income. The results of the EJ analysis are shown in the enclosed in Appendix H. These figures result in a ranking scale of one to one hundred that indicates the potential for discrimination. A ranking below thirteen indicates a low possibility of discrimination while a ranking above fifty indicates a high probability of discrimination.

The proposed project will not have any significantly adverse impacts on people or any disproportionate effects on minority or low-income populations. No mitigation measures are required in reference to environmental justice issues.

3.11 Other Resources

3.11.1 Public Health and Safety

The proposed project will improve public health and safety, with the availability of a wastewater collection system, and less reliance with on-site septic tank and leachfield systems. SMA's experience indicates that these small wastewater treatment systems face barriers in being protective of human health and the environment. This is due to the fact that small on-site septic systems do not normally reduce the amount of nitrogen in wastewater discharged. The discharged wastewater has the potential to cause ground water to become elevated in nitrate, which is a contaminant that can cause health impacts if ingested. The proposed project will decrease the number of existing and future on-site wastewater treatment facilities and limit the potential that these systems will impact human health and the environment.

3.11.2 Energy

Since the proposed Village of Corrales wastewater collection system is a force main system, it will be operated by electrical power. Each business or residence connecting to the wastewater collection system will require either an effluent pump or grinder pump. The horsepower requirements on these types of pumps vary, but are expected to be rated with power requirements less than 5 horsepower, and will cycle dependent upon demand. Commercial facilities with intact septic tanks will require less power than older septic tanks with infiltration problems; which will pump larger amounts of effluent due to dilution with groundwater. Energy will be required to operate the lift station at the terminus of the wastewater transmission system, which will be operated by the ABCWUA.

Construction and operation of the proposed wastewater collection system is not anticipated to consume large amounts of energy, and no mitigation measures are required.

3.11.3 Transportation

Transportation service to Corrales is provided primarily by the two-lane Corrales Road (NM 448) which is generally oriented north-south. Additional access to Corrales is via Loma Larga Road, although this road is outside the project area. Some additional long-term growth and increased traffic is possible from installation of the wastewater collection system along the Corrales Road corridor, as commercial development increases because of easier and more cost effective access to wastewater treatment. However, the amount of available land for new commercial development along the Corrales Road corridor is limited.

Typical petroleum products such as gasoline and diesel are used for fueling construction equipment, and some fuels may be temporarily stored in a construction lay down yard during construction. Best Management Practices (BMPs) will be incorporated into project plans to

avoid the potential for storage of hazardous materials or petroleum products in close proximity to surface water.

Operation of the proposed wastewater collection system is not anticipated to have a detrimental effect upon the local transportation network.

Some minor disruption of traffic will occur during construction activities of the wastewater collection system on Corrales Road. However, traffic flow will be redirected as necessary during construction activities according to the Manual of Uniform Traffic Devices and applicable traffic control plans developed for the project. The changes in traffic patterns will be temporary, and the directional boring and pipe laying construction activities will be conducted in a phased approach.

No mitigation measures other than traffic control during construction activities are required for transportation issues associated with the proposed project.

3.11.4 Visual Impacts

Regulations of NEPA and CEQ identify aesthetics, or visual quality, as one of the elements in the environment that may be considered in determining the effects of a construction project. Visual resources are those physical features that make up the visible landscape, including land, water, vegetation, and human-made elements. The location, design, and maintenance of wastewater facilities may adversely or positively affect visual features of the landscape. Concern over adverse visual impacts can be a major source of project opposition. The installation of the proposed wastewater collection system will not alter the visual environment in the project area, other than the presence of air relief valve vaults, meter pits, or pressure sustaining valve vaults. Based on preliminary conceptual designs, it is anticipated that up to 10 locations over an approximate 15,100 linear feet, assuming that the Corrales Road Transmission system alternative is the preferred alternative. The installation of the wastewater force main using the directional boring approach will eliminate the need for regular spaced manholes, typically present for conventional gravity wastewater collection systems.

No mitigation measures are required for visual impacts from the proposed project.

3.11.5 Noise

Ambient noise levels in the project area are moderate, based on the relatively high traffic density along Corrales Road. Noise impacts as a result of installation of the wastewater collection main will not be evident, since the piping will be installed utilizing directional drilling methodology and will minimize the amount of construction equipment required during construction.

During construction, there will be a slight increase in noise pollution from construction equipment. Efforts will be utilized to minimize noise impacts. Noise is unavoidable but

temporary and is not expected to cause a large impact, based on the distance of residences from the construction area. Construction activities will be limited to the directional boring machine operations in the staging areas, which are anticipated to be present in up to 10 locations along the Corrales Road Business Core. The final number and location of the staging areas will be determined during the final design process.

3.11.6 Public Service and Infrastructure

Electrical and natural gas service in the Corrales area is provided by the Public Service Company of New Mexico (PNM). PNM has a 3-inch diameter natural gas main along the east side of Corrales Road. Potable water is supplied by private water supply wells. Completion of proposed project is expected to have a positive contribution to groundwater quality in the Corrales Area, based on less reliance with on-site septic tank and leach field wastewater treatment systems.

Construction and operation of the proposed wastewater treatment facility is not anticipated to have a detrimental effect upon Public Service and Infrastructure.

3.11.7 Areas of Critical Environmental Concern

There are no Areas of Critical Environmental Concern (ACEC) in the proposed project area. No mitigation measures are required.

3.11.8 Impaired Properties/Hazardous Materials

No hazardous materials or wastes shall be disposed of on the site. While it is not anticipated that any hazardous materials will be generated or used, in the event of such generation, any hazardous materials shall be removed from the site and properly handled. An on-site visit by Souder, Miller & Associates, was completed in April 2008. The visit revealed no evidence of recognized environmental conditions (RECs) in connection with the property.

Typical petroleum products such as gasoline and diesel are used for fueling construction equipment, and some fuels may be temporarily stored in a construction lay down yard during construction. Best Management Practices (BMPs) will be incorporated into project plans to avoid the potential for storage of hazardous materials or petroleum products in close proximity to surface water.

3.12 Cumulative Impacts

The construction and operation of the proposed wastewater collection and transmission systems are not anticipated to commit irreversible or irretrievable resources.

Cumulative impacts from the proposed project include a minor change in visual resources with the construction of the wastewater collection system air relief vaults, cleanout manholes, and pressure sustaining valve vaults. However, since the wastewater collection system will be installed using directional boring techniques, the distance between the manholes and vault

locations is anticipated be approximately 750 feet, so only approximately 10 locations will be required for the Business Core collection system. An additional estimated 8 staging areas will be require for construction of the Corrales Road transmission system from Meadowlark Land to the ABCWUA lift station at Calle Cuervo. The final number of staging areas and vaults will be determined following completion of the final design. The wastewater collection system would be compatible with the land use in the Business Core, since the area is commercially zoned.

Some temporary noise and dust may be generated during construction activities. However these effects will be limited to the approximate 10 staging areas required to install the wastewater collection system within the Business Core, and an additional approximate 8 staging areas along the Corrales Road transmission system alternative.

Implementation of the proposed project is anticipated to have a positive effect upon the growth in the Corrales, since new commercial businesses within the Corrales central area will be able to connect to the sewer system.

The proposed project will have a positive effect upon groundwater quality, since new businesses and residences within the project area would no longer discharge septic system effluent into the aquifer. The decreased effluent loading into the aquifer would be a positive effect on groundwater quality.

Although the proposed project may cross the Cabezon channel at the southern end of the project if the Corrales Road Transmission system alternative is selected, no impacts will occur to the channel or ditch bottom since the crossing will be completed using the directional boring technique or a bridge may be used to support the pipe crossing. A Section 404 permit may be required in the event of a ditch crossing. The USACE will be consulted to assess permit requirements once the final transmission system alignment is designed.

The proposed project will not affect wetlands, since no jurisdictional wetlands are present within the project area.

Much of the project area is currently developed with Village of Corrales roads, utilities, state and county highways. Since the largest area affected by the proposed action will take place during construction of the wastewater collection system, cumulative impacts are expected to be minimal. With the exception of the pressure sustaining valve vaults, cleanout manholes, and meter pit vaults, the visual impacts to the project area are expected to minimal following completion of construction activities.

Effects to air quality from the proposed wastewater collection system are not anticipated, since the collection system will be buried below grade. Some minor odors may be experienced in areas close to the air relief vault locations.

Since threatened and endangered species or associated habitats are not present within the area affected by the proposed action, impacts to listed species would not occur.

Although the findings of the cultural resource survey indicated that the project could possibly affect the Martinez/Perea Hall if the wastewater collection main was placed on a west side of Corrales Road at the HPD-1858, completion of the project will have no effect to significant cultural resources, and a cultural resource clearance is recommended for the project. Since the final design for the wastewater collection system is not yet completed, the exact location of the piping near the Martinez/Perea Hall is unknown. However, the final design will take the Martinez/Perea Hall into account, and care will be exercised to avoid impacting the structure. SMA understands that the State Historic Preservation Officer (SHPO) typically has concerns over the vibration effects from project activities. However, the vibration effects from traffic along Corrales Road will no doubt be much greater in magnitude than the effects of directional borings. Preferably, the wastewater collection main will be located on the east side of the road near the Martinez/Perea Hall.

Since the preferred alternative for the wastewater transmission system is the Corrales Road Alternative, no vegetation is expected to be adversely affected by construction activities.

Some temporary effects will occur to the transportation network during construction of the proposed project. Some minor disruption to traffic patterns from project activities is expected. However, traffic flow will be redirected as necessary during construction activities according to the Manual of Uniform Traffic Devices and applicable traffic control plans developed for the project. However, these effects will be limited to the approximate 6-month or less period of construction.

4.0 SUMMARY OF MITIGATION MEASURES

The project includes the Business Core wastewater collection system and the preferred wastewater transmission system alternative is the Corrales Road alternative.

4.1 Physical Resources Measures

The following mitigation measures will be implemented to protect land, surface water, groundwater and air resources.

Landforms and soils

The proposed wastewater collection system will require excavation up to 4 feet below grade at the locations of the staging areas used to implement the directional boring advancement. Each directional boring staging area will require approximately 80 square feet or an area of approximately 20-feet long, by 4-feet wide and 4-feet deep. The estimated total APE for the project is approximately 0.17 acres.

The U.S. Environmental Protection Agency (USEPA) requires National Pollutant Discharge Elimination System (NPDES) permit coverage for stormwater discharges from construction projects that will result in the disturbance of one or more acres of total land area. A Stormwater Pollution Prevention Plan (SWPPP) is required under 40 CFR §122 for construction activities that result in a total land disturbance of 1 acre or greater, and where those discharges enter the surface waters of the United States. Since the proposed project will only disturb approximately 0.17 acres, a SWPPP will not be required as part of the proposed project. However, the construction contract specifications will include Best Management Practices (BMPs) to reduce the potential for off-site migration of sediment into surface water. Additionally, equipment fueling operations will be conducted at locations away from surface water to minimize potential for spills. Construction equipment will not be parked in close proximity to surface water. Hazardous materials used in the construction process will be stored in a secure location away from surface water. If the project design changes so that an area greater than 1 acre will be disturbed, then a SWPPP will be prepared.

Some dust will be generated during construction. Mitigation measures will include contractual requirements to reduce dust during construction by watering or covering disturbed areas.

Floodplains

Based on review of Federal Emergency Management Agency (FEMA) Flood Rate Insurance Maps (FIRM) found in Appendix C, SMA understands that a majority of the land east of the Corrales Acequia are designated as being within river flood hazard areas, and in areas with a 1 % or greater annual shallow flooding risk. Depths of the flooding based on the FIRM maps in the project area typically vary between 1 and 2 feet. Significant development, including residential and commercial development, has already occurred in these areas. Several irrigation ditches (acequias) in the Village help provide flood control.

Impacts to the project in the event of a flood are not considered to be detrimental, since the wastewater collection and transmission mains will be located underground, and will still function as designed. If a significant flooding event occurs during construction activities, then temporary dewatering operation may be required, depending upon flood duration, intensity and soil infiltration capacity.

No mitigation measures are required in regards to the floodplains, other than adherence to the BMP's developed during the engineering design process.

Surface Water

Construction, implementation and operation of the proposed wastewater collection system will not adversely affect surface water. Mitigation measures other than adherence to the BMPs are not required to protect surface water supplies. If the project design changes so that an area greater than 1 acre will be disturbed, then a SWPPP will be prepared. SMA did consult with the U.S. Army Corps of Engineers (USACE) regarding wetlands and surface water. The USACE stated in a written response, dated May 14, if the project involves work in the waters of the United States, that a Section 404 permit may be required. The final need for a Section 404 permit will be determined after completion of the final design of the proposed project.

Groundwater

Threats to water quality in the vicinity of the proposed project area include nitrates from septic systems. Construction of the wastewater treatment plant should reduce the nitrate loading in groundwater in the area because of decreased stress upon the aquifer. Detrimental effects upon groundwater as a result of implementation of the proposed are not anticipated.

No mitigation measures are required to protect groundwater.

Air Quality

The proposed project activities are not anticipated to have a detrimental effect on air quality, since the duration of the project utilizing heavy equipment is anticipated to be six months, or less. No significant emissions are expected and dust control mitigation will be part of project activities.

Some dust will be generated during construction. Mitigation measures will include contractual requirements to reduce dust during construction by watering down or covering disturbed areas.

Noise

During construction, there will be a slight increase in noise pollution from construction equipment. Efforts will be utilized to minimize noise impacts. Noise is unavoidable but temporary and is not expected to cause an impact, based on the distance of residences from the construction area.

Transportation

No mitigation measures other than traffic control during construction activities are required for transportation issues associated with the proposed project.

4.2 Biological Resource Measures

The New Mexico Department of Game and Fish (NMGF) responded to SMA's request for information regarding impacts to threatened or endangered species or critical habitat and indicated the project is unlikely to affect wildlife or wildlife habitats. To minimize trapping of wildlife during trenching operations, trenching and backfilling piping will be conducted concurrently. A minimal amount of trenching will be kept open overnight, and escape ramps will be provided for wildlife. Following completion of construction activities, disturbed areas will be reseeded with native vegetation to minimize erosion.

In order to reduce the potential for spreading noxious weeds to the project area, noxious weeds should be sprayed with herbicide prior to start of construction activities, as required. No other mitigation measures are required for noxious weeds.

4.3 Threatened and Endangered Species Measures

The presence of threatened and endangered species or associated habitat was not documented during the biological evaluation.

The New Mexico Department of Game and Fish (NMGF) responded to SMA's request for information regarding impacts to threatened or endangered species or critical habitat and indicated the project is unlikely to affect wildlife or wildlife habitats. Trenching and pipe backfilling activities will be conducted with escape ramps to minimize trapping of wildlife during trenching operations.

4.4 Socioeconomic/Environmental Justice Measures

By providing a means of wastewater collection system, the proposed project will likely have a positive effect on socioeconomic conditions in the area. Provision of basic utilities, such as wastewater collection, will raise the standard of living in the area.

The proposed project will benefit minority and low-income populations, by providing a wastewater collection system to community residents.

4.5 Archeological, Cultural and Historic Resources Measures

In order to provide for protection of possible cultural resource materials during construction activities, the construction contract documents should include the following or similar language:

"In the event of a discovery ["discovery" means any previously unidentified or incorrectly identified cultural resources, including but not limited to, archaeological deposits, human

remains, or locations reportedly associated with Native American religious/ traditional beliefs or practices], the Contractor must immediately cease all operations in the immediate vicinity of the discovery and notify the Engineer. The Contractor should be aware of his/her responsibilities under the Historic Preservation Act of 1966 and the Archeological Resources Protection Act of 1979.”

Upon notification of a discovery by the Contractor, the Engineer must immediately notify the New Mexico State Historic Preservation Office (NMSHPO), as well as other Native American groups that have requested notification (the Comanche Tribe, for example).

Although the findings of the cultural resource survey indicated that the project could possibly affect the Martinez/Perea Hall if the wastewater collection main was placed on a west side of Corrales Road at the HPD-1858, completion of the project will have no effect to significant cultural resources, and a cultural resource clearance is recommended for the project. Since the final design for the wastewater collection system is not yet completed, the exact location of the piping near the Martinez/Perea Hall is unknown. However, the final design will take the Martinez/Perea Hall into account, and care will be exercised to avoid impacting the structure. SMA understands that the State Historic Preservation Officer (SHPO) typically has concerns over the vibration effects from project activities. However, the vibration effects from traffic along Corrales Road will no doubt be much greater in magnitude than the effects of directional borings. Preferably, the wastewater collection main will be located on the east side of the road near the Martinez/Perea Hall.

4.6 Environmentally Sensitive Areas

No environmentally sensitive areas are present within the project area. No mitigation steps are required for environmentally sensitive areas.

4.7 Other Resources

During construction of the project, there will be an increase in the amount of truck and construction equipment traffic on roads in the area. This will be a temporary and unavoidable impact from the project. All construction traffic shall be limited to existing roadways and rights of way to the extent possible. A site specific traffic control plan will be prepared for the project. Some construction activities may be scheduled at night to minimize the disruption to local businesses and reduce traffic congestion.

There will be no burden to existing social services, educational facilities, or medical facilities from the use of the proposed project. The proposed project will improve community access to these services, by improving the domestic utilities and sanitary infrastructure in the proposed project area.

4.8 Cumulative Impact Measures

Cumulative impacts are defined as the combined impacts of individual actions. In the case of the project, the cumulative impacts include the combined impacts of the proposed action to

provide wastewater collection and transmission system, as well as possible future actions by the Village of Corrales to extend sewer lines to Corrales area residents who currently lack service.

The project will be constructed in phases to reduce the overall impact to the Village. Since directional boring techniques will be implemented to construct the wastewater collection and transmission system, the primary areas of impact will be the staging areas. The location of the staging areas will be dependent upon the final engineering design, locations of business access, capability of the directional boring machine, location of existing utilities and other factors.

Some minor disruption of traffic will occur during construction activities of the wastewater collection system on Corrales Road. However, traffic flow will be redirected as necessary during construction activities according to the Manual of Uniform Traffic Devices and applicable traffic control plans developed for the project. The changes in traffic patterns will be temporary, and the directional boring and pipe laying construction activities will be conducted in a phased approach.

Some construction activities may be scheduled at night to minimize the disruption to local businesses and reduce traffic congestion.

The cumulative negative impacts from the project will be mostly short-term and related to construction activities. In the long-term, the proposed project will have positive impacts on the community and environment with the decreased nitrate loading on the aquifer, limited increased commercial growth along the Business Core, and the cost effective ability to treat wastewater through the ABCWUA treatment system.

5.0 CONSULTATION AND COORDINATION

5.1 Personnel

Personnel from the following agencies were involved in the preparation of this report.

- The Village of Corrales
- Souder, Miller & Associates
- New Mexico Environment Department - Construction Programs Bureau

5.2 Consultation/Coordination

The following state, federal and tribal entities were consulted regarding the findings of this report. Copies of correspondence are included in Appendix G.

Table 10 - Listing of Tribal, Agency and Environmental Groups Consulted

Date Submitted	Name	State, Federal or Tribal Entity
May 8, 2008	Chairman Wallace Coffey	Comanche Indian Tribe
	Chairman Benjamin Nuvamsa	Hopi Tribal Council
	President Levi Pesata	Jicarilla Apache Nation
	President Joe Shirley	Navajo Nation
	Governor Earl Salazar	Ohkay Owingeh
	Governor Ernest Suina	Pueblo of Cochiti
	Governor Robert Benevidez	Pueblo of Isleta
	Governor Paul Chinana	Pueblo of Jemez
	Governor John Antonio, Sr.	Pueblo of Laguna
	Governor Michael Chavarria	Pueblo of Santa Clara
	Governor Robert Montoya	Pueblo of Sandia
	Governor Sisto Quintana	Pueblo of Santo Domingo
	Governor Ronald L. Tenorio	Pueblo of San Felipe
	Governor Leon T. Roybal	Pueblo of San Ildefonso
	Governor Ulysses Leon	Pueblo of Santa Ana
	Governor Ivan Pino	Pueblo of Zia
	Gedi Cibas	New Mexico Environment Department
	Marcy Leavitt	New Mexico Environment Department - Surface Water Quality Bureau
	Bill Olson	New Mexico Environment Department - Groundwater Quality Bureau
	Mary Day	New Mexico Environment Department - Drinking Water Bureau
	Mary Uhl	New Mexico Environment Department - Air Quality Bureau
	Auralie Ashely-Marx	New Mexico Environment Department - Solid Waste Bureau
Bill Olson	New Mexico Environment Department - Groundwater Quality Bureau	
Bob Sivinski	New Mexico Energy, Minerals and Natural Resource Department	

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Date Submitted	Name	State, Federal or Tribal Entity
May 8, 2008	Susan MacMullin	United States Department of Interior - Fish and Wildlife Service, New Mexico Ecological Services Field Office
	Lisa Kirkpatrick	New Mexico Game and Fish Department
	Roxanne Runkel	National Park Service
	Gordon A. Hambrick	US Army Corps of Engineers
	John Poland	US Bureau of Reclamation
	Candy Ford	US Bureau of Reclamation
	Debbie Hays	Sandoval County
	John D'Antonio	New Mexico Office of the State Engineer
	Janet McVickar	New Mexico Department of Transportation
	Colleen Vaughn	New Mexico Department of Transportation
	David Gensler	Middle Rio Grande Conservancy District
	Ray Gomez	Middle Rio Grande Conservancy District
	Jim Orwat	Federal Emergency Management Agency, Region VI
	Mark Sanchez	Albuquerque Bernalillo Water Utility Authority
	Tim West	Bernalillo County
	Cynthia Tidwell	Village of Corrales
	Michael Mudd	Sierra Club
John Horning	Forest Guardians	
Brian Shields	Amigos Bravos	
May 30, 2008	Josh Sherman	USDA - Natural Resources Conservation Service
July 15, 2008	Michelle Ensey	Department of Cultural Affairs, Historic Preservation Division

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Table 11 - Responses Received Tribal Officials During Consultation Process

Tribe, Nation or Pueblo, Organization	Date Received	Contact Name	Verbal/ Written	Comments (if any)
The Hopi Tribe	5/19/08	Governor Benjamin Nuvamsa	Written	Leigh J Kuwanwisiwma, Director, Hopi Cultural Preservation Office responded with the following comments: The Hopi Tribe considers prehistoric archaeological sites to be Traditional Cultural Property. If any are identified that will be adversely impacted, they request copies of the cultural resource survey report and any proposed draft treatment plans for review & comment. Additionally, if any cultural features or deposits are encountered, activities must be discontinued and State Historic Preservation Office must be notified. If any Native American human remains or funerary objects discovered, notification must be made immediately by law.
Jicarilla Apache Nation	5/22/08	Lorene Willis	Written	Response provided by Lorene Willis, Director – Jicarilla Apache Cultural Affairs. The Jicarilla Apache Nation has no immediate concerns regarding this project. However, they request to be notified if environmental analysis determines the project would adversely impact the Rio Grande River. Additionally, they request immediate notification in the event of inadvertent discovery of human remains or associated funerary objects.
Pueblo of Laguna	5/15/08	Governor John Antonio, Sr.	Written	The Pueblo of Laguna has determined that the proposed undertaking will not have significant impact at this time. They request notification in the event that any new archaeological sites are discovered or new artifacts are removed.
Ohkay Owingeh	7/15/08	Governor Earl Salazar	Written	Response from Herman Agoyo, Realty Officer/NAGPRA Rep. No comment
Pueblo of San Ildefonso	7/14/08	Governor Leon T. Roybal	Verbal	As per discussion with Steve Rydeen no comment
Pueblo of Santa Ana	7/18/08	Governor Ulyssess Leon	Verbal	Received telecommunication from Mr. Ben Robins, Tribal Resource Coordinator for Santa Ana Pueblo on July 18, 2008. Mr. Robins explained that Santa Ana Pueblo does not have any comment regarding the proposed Corrales Wastewater system.
Pueblo of Santa Clara	7/14/08	Governor Michael Chavarria	Verbal	As per discussion with Joseph Chavarria, environment dept no comment

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