SITE APPLICATION
ENGINEERING REPORT

FOR

EAST ALAMOSA WATER AND SANITATION DISTRICT
ALAMOSA COUNTY, COLORADO
2023 LIFT STATION REPLACEMENTS

NOVEMBER 2022

RGA JOB NO.: 1017.0011

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1 INTRODUCTION

1.1 GENERAL

The East Alamosa Water and Sanitation District operates nine lift stations. The District is proposing the replacement of Lift Station No. 3 and Lift Station No. 6 due to a combination of factors. These factors include the nearing end of useful service life, continued maintenance issues, insufficient overflow volume, and overall lift station capacity. These lift stations also have mechanical, electrical and other maintenance problems on a regular basis.

1.1.1 Lift Station No. 3

Lift Station No. 3, also known as the McKinney and McQuery Lift Station, was rehabilitated in 1995 and consists of a precast concrete wet-well, two (2) submersible non-clog pumps (Barnes Model No. 4SE1926L) rated at 130 gallons per minute (GPM), and a pump control panel. The lift station picks up flows from Lift Station No. 4 directly to the north and residential gravity flows from the Lift Station No. 3 Contributing Area. It then discharges into a manhole through a 4-inch diameter force main approximately 40 feet to the south. A 6-inch diameter gravity sanitary line comes out of that manhole to the south and flows towards the manhole at Lift Station No. 2, bypassing Lift Station No. 9.

The replacing of Lift Station No. 3 will consist of flow-filling a new manhole base in the existing wet-well and grouting in channels, converting it to a manhole that will collect all flows from Lift Stations No. 3 and No. 4 contributing areas. These flows will be conveyed to a new, 6-foot diameter precast concrete wet-well with adequate depth to maintain desirable pump-run times and an additional manhole to provide overflow storage. Additionally, a 30-inch by 48-inch traffic-rated access hatch will be installed for easier system maintenance, two (2) new pumps and all ancillary equipment including rails, chains, and floats, and a new control panel installed in the same location as the old lift station. Lastly, the gravity collection pipes downstream from the new lift station will be replaced with 8-inch SDR35 PVC pipe.

1.1.2 Lift Station No. 6

Lift Station No. 6, also known as the Rodeo Lift Station, was rehabilitated in 1995 and consists of a precast concrete wet-well, two (2) submersible non-clog pumps (Barnes Model No. 4SE1946L) rated at 75 GPM, and a pump control panel. The lift station picks up residential gravity flows from the Lift Station No. 6 Contributing Area. It then discharges into a manhole approximately 925 feet to the west through a 4-inch diameter force main. A 6-inch diameter gravity sanitary line comes out of that manhole to the west and flows through three additional manholes along Santa Fe Avenue (Highway 160) before flowing into Lift Station No. 5.

The improvement of Lift Station No. 6 will consist of installing two (2) new 100 GPM pumps with all ancillary equipment, including rails, chains, and floats. These pumps will provide 33% more pumping capacity for Lift Station No. 6 and provide a greater factor of safety for the lift station. A new overflow wet-well will also be installed adjacent to the existing wet-well proving additional storage for the system. A new control panel adjacent to the lift station will also be included. The wet-well will be constructed to an adequate depth to maintain desirable pump-run times, and the pipes upstream will be corrected and upsized.

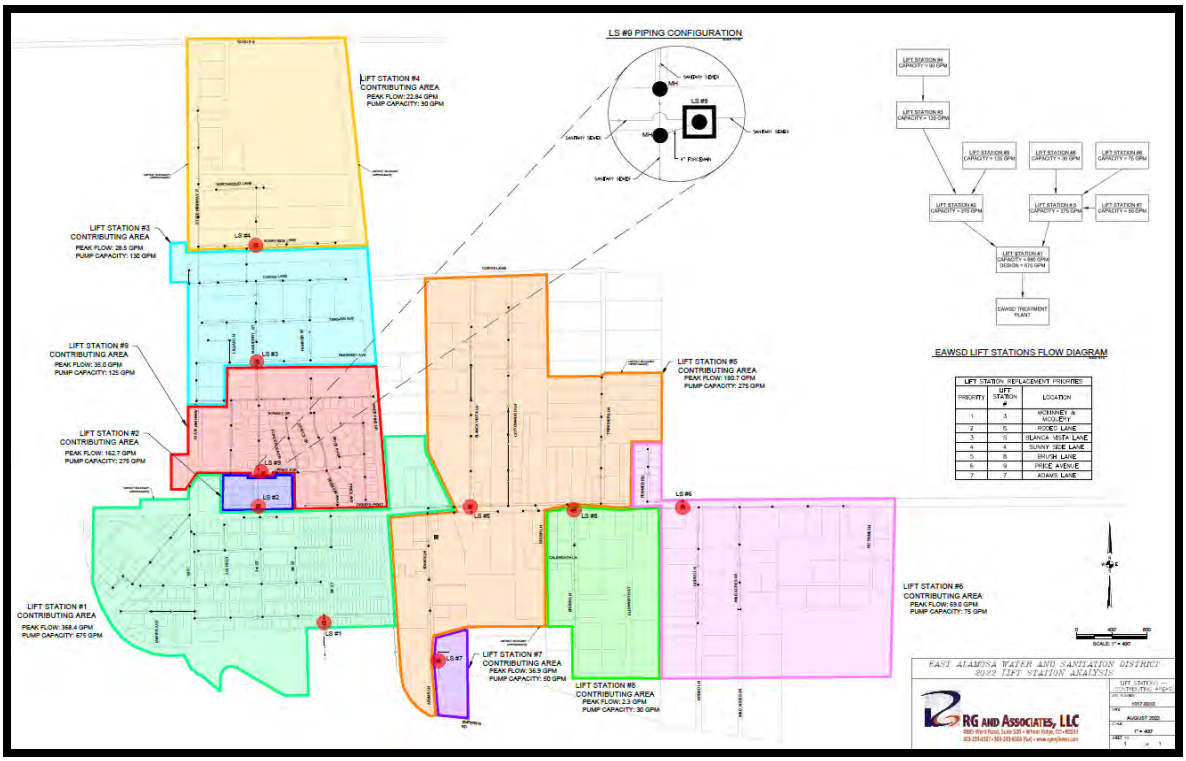


Figure 1 – Lift Station Contributing Areas

1.2 RECORDS

As is the case with many districts and municipalities, detailed records on the existing equipment and installation date of the two (2) lift stations is not readily available. The EAWSD Lift Stations Contributing Areas Exhibit is attached to this Report in **Appendix A**.

1.3 APPLICABLE REGULATORY SECTIONS

This *Site Application Engineering Report* will address the requirements set forth in Regulation 22. These proposed lift stations will be designed in accordance with the *Colorado Design Criteria for Domestic Wastewater Treatment Works, Section 7*.

1.4 APPLICANT INFORMATION

Applicant:

East Alamosa Water and Sanitation District
10 Costilla Boulevard
Alamosa, Colorado 81101
(719) 589-2649

Representative:

Jamie Greeman
District Manager
(719) 589-2649

1.5 SERVICE AREA

The East Alamosa Water and Sanitation District is located east of the Rio Grande River and serves a populated area that is adjacent to, but not included in the City of Alamosa. **Figure 2** shows the location of the proposed project. A scaled map depicting the East Alamosa Water and Sanitation District service area boundary and the location of all existing lift stations is in **Appendix A**. This map also shows the zoning of East Alamosa.

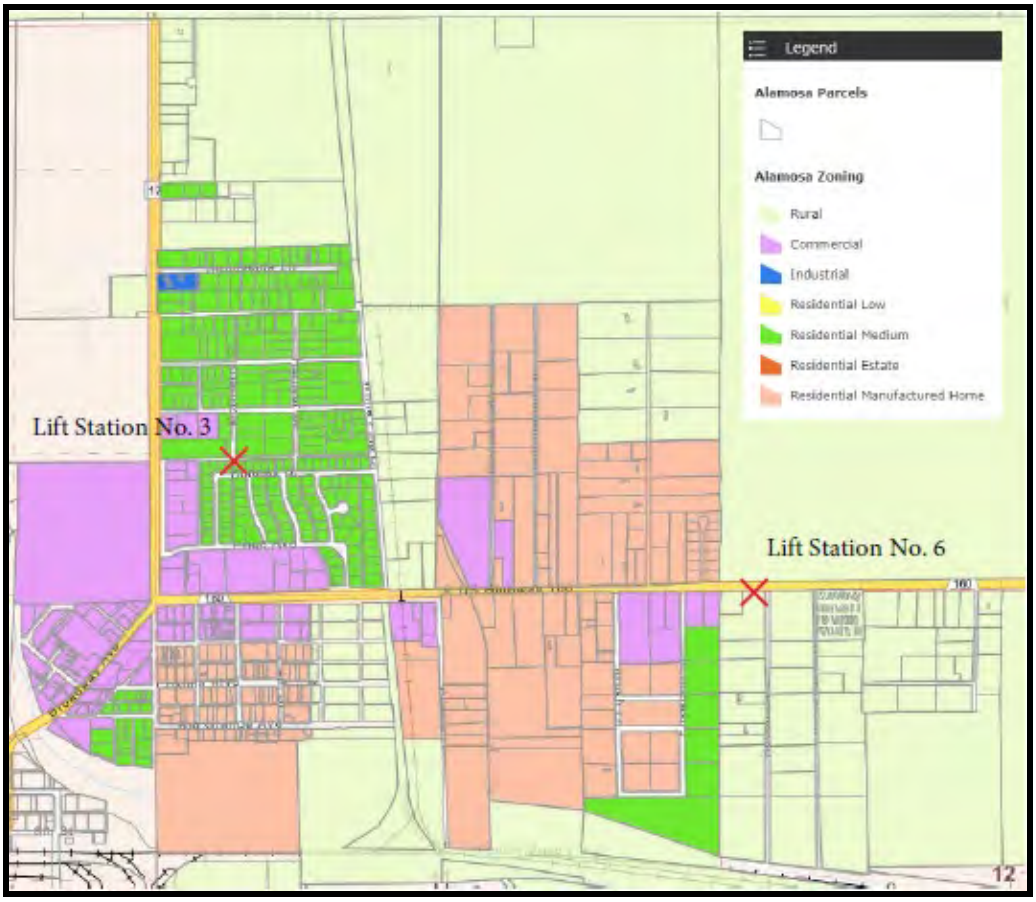


Figure 2 - Vicinity Map

1.5.1 Topography and Soil Characteristics

In 1995 Davis Engineering Service, Inc. prepared a Preliminary Engineering Report (PER) concerning improvements to the District's sewage collection system. The PER, located in **Appendix B** of this report, describes the District's service area as being relatively level with a natural slope of approximately five feet per mile to the southeast. A USGS topographical map is in **Appendix C**. The typical soil characteristic of the area is described as fine-grained alluvium. A general soils analysis from the USGS web soils survey is in **Appendix C**.

1.5.2 Local Water Bodies, Streams, and Rivers

Nearby water bodies include the Rio Grande River and the Maddux Ditch. Groundwater level is relatively shallow throughout the service area. Seasonal high ground water levels usually

occur in the month of June with depths below ground surface of three feet or less in many areas. Groundwater levels commonly decline two or more feet during the fall and winter compared to June depths. The existing lift stations have not encountered any known groundwater related issues, although infiltration is a possibility.

There are very few NPDES systems within a five-mile radius. **Appendix D** illustrates the mapping results of nearby NPDES systems obtained from the EPA My Waters mapper. Also located in **Appendix D** is a one-mile radius exhibit of each water well found within that radius. The wells within this area have a CIU code of 'U' which, according to DWR, has the following description: Recordings/Registration of map filings of non-exempt or large capacity wells from the 1950's and early 1960's.

1.5.3 100-Year Floodplain, Wetlands and Wildlife

Neither of the lift stations to be replaced are located within the 100-year floodplain. A FIRM showing the location of the proposed project is in **Appendix D** of this report. Also, according to the information available through the National Wetlands Inventory, there are no wetlands within the project area. A wetlands delineation map of the proposed project surrounding area is in **Appendix D.**

There are no known threatened or endangered species within the existing boundaries of the East Alamosa Water and Sanitation District. The proposed project will thus not impact any threatened or endangered species.

1.5.4 Population and Growth Trends

The East Alamosa Water and Sanitation District is solely responsible for water distribution and wastewater collection. The overall customer base has increased from 1,389 customers in 1990 to 1,698 customers today, or thirteen (13) customers per year (less than a 1% growth rate per year). The overall growth has slowed over the past several years and is expected to remain minimal. The District's service area has not grown much historically and there are currently no plans for extending the District's boundaries, however there is potential for growth in the District in the future.

Currently, Lift Station No. 3 does not require an increase in pumping capacity, but it does require an increase in storage volume. The lift station service area, and that of the upstream lift station, is mostly built out. If the proposed apartment complex of thirty-two (32) multi-family units is constructed, the flow from the service area will not drastically change the peak inflows. The lift station will not require additional pumping capacity in comparison to the two (2) existing pumps servicing Lift Station No. 3. This additional flow will not drastically affect the downstream lift stations being Lift Stations No. 2 and No. 1, in that order, respectively. The peak flow is estimated to increase by 10.7 GPM. This slight increase would only decrease the available pump capacity by a couple of percentiles. This information can be seen in **Table 1**.

Lift Station No. 6 does not necessarily require an increase in pumping capacity as the flows have not increased, and are not expected to increase, over the next twenty (20) years. However, the pumping capacity will be increased from 75 GPM to 100 GPM to increase the overall factor of safety of the lift station. The Lift Station will also gain additional storage

volume. The lift station service area has been developed along Femmer Road, with a mobile home park off Wild Acres Lane. If there is more expansion of the Lift Station No. 6 Contributing Area to the south of Santa Fe Avenue (Highway 160), contributing flows to the existing lift station may exceed its current capacity of 75 GPM. The proposed capacity with the new lift station will be 100 GPM. This is a 33% increase in pump capacity.

1.5.5 Land Use

The majority of the district is residential with some commercial establishments along Highway 160. The service areas for Lift Stations No. 3 and 6 are primarily residential as seen in **Figure 1**.

1.5.6 Hydraulic Loading Analysis

A. Lift Station No. 3

This lift station receives flows from Lift Station No. 4 which has a peak flow of 23 GPM, and the proposed replacement of Lift Station No. 3 will contribute a periodic peak flow of 29 GPM of flow to Lift Starion No. 2, then Lift Station No. 1, and finally to the City of Alamosa Regional Wastewater Facility. No change in flow will occur in the system compared to the existing lift station unless the proposed apartment complex is constructed. If this 32-unit apartment complex is constructed, the flows for Lift Station No. 3, and all ensuing lift stations, are only expected to increase by 10.7 GPM.

B. Lift Station No. 6

The proposed replacement of Lift Station No. 6 will contribute a periodic peak flow of 69 GPM of flow to Lift Station No. 5, then Lift Station No. 1, and finally to the City of Alamosa Regional Wastewater Facility. No change in flow is expected to occur in the system compared to the existing lift station, even though the capacity of the lift station is increasing to create a higher factor of safety.

Table 1 shows the maximum month flow, the peak flow, the pump capacity, and the percent capacity of the lift stations in the East Alamosa Water and Sanitation District.

Table 1 – Existing Lift Station Pump Capacities

LS #	Location	Max Month	Maximum Month Flow (gpm)	Peak Flow (gpm)	Pump Capacity (gpm)	Capacity (%)
1	Rio Grande Ave	February	92.1	368.4	675	54.6%
2	160 & Inn of Rio Grande	June	40.7	162.7	275	59.2%
3	McKinney & McQuerry	November	7.1	28.5	130	21.9%
4	Sunnyside Lane	July	5.7	22.8	90	25.4%
5	Blanca Vista Lane	October	45.2	180.7	275	65.7%
6	Rodeo Lane	December	17.2	69.0	75	91.9%
7	Adams Lane	July	9.2	36.9	50	73.9%
8	Brush Lane	January	0.6	2.3	30	7.6%
9	Price Avenue	November	8.7	35.0	125	28.0%

1. Lift Station Pump Hours provided by EAWSD via City of Alamosa for July 2021 - June 2022
2. Metcalf & Eddy, 4th Edition

1.6 TREATMENT ENTITY

All wastewater collected by the East Alamosa Water and Sanitation District is treated by the City of Alamosa at the Alamosa Regional WasteWater Treatment Plant (ARWWTP). The District acts as an intermediary responsible for conveying the wastewater to the tie-in point in the City of Alamosa's sewage collection system.

1.7 PROJECT IMPACT TO TREATMENT ENTITY

There will only be an increase in capacity of a lift station in the system without an increase in flow into the treatment facility. No additional flow or BOD loading will be seen at the treatment plant by the replacement of the existing lift stations.

1.8 LEGAL CONTROL OF SITE

Both proposed lift stations are to be located within the legal boundaries of the District. In addition, easements will not be required, as the proposed project is located within the public right-of-way.

1.9 WASTEWATER TREATMENT ENTITY STATEMENT

There will not be an increase or decrease in the capacity of Lift Station No. 3, therefore there will not be an increase or decrease in the influent flow into the existing treatment facility. Although there is an increase in capacity for Lift Station No. 6 that will result from the proposed project, there will not be an increase or decrease in influent flow to the existing ARWWTP. The City of Alamosa is aware of the replacement project and works closely with the East Alamosa Water and Sanitation District on a day-to-day basis. The City of Alamosa staff operates the East Alamosa system on a contract basis. City of Alamosa staff will be kept up to date on all project milestones and will be included in the design review process.

2 EMERGENCY OPERATIONS AND MAINTENANCE

2.1 EMERGENCY OPERATIONS AND MAINTENANCE

2.1.1 Emergency Operations plan

The primary purpose of an emergency operation and maintenance plan for a lift station is to 1) prevent overflows through routine maintenance and 2) ensure there is a procedure to follow if a potential overflow event occurs. A preliminary emergency response plan has been developed as part of this site application and is detailed in this section and details the following:

- Identification of Potential Causes of Overflow
- Operation and Maintenance Practices to Prevent Overflows
- Engineering Features to Address Sanitary Sewer Overflows
- Emergency Preparedness

The City of Alamosa staff currently operates the existing lift stations and will continue to operate them. All emergency response procedures will be managed by City of Alamosa staff.

2.1.2 Identification of Potential Causes of Overflow

The lift station will be equipped with pump failure and high wet-well alarms and an auto-dialer that will alert operations staff to equipment failure and/or high wet-well level. In addition to the auto-dialer, an audible alarm and visual alarm light will activate to alert and draw attention in the surrounding area. The City of Alamosa has dedicated 24-hour on-call staffing that will quickly respond to emergencies or alarms.

2.1.3 Operation and Maintenance Practices to Prevent Overflows

Routine operation and maintenance checks are essential to prevent overflows from a lift station. It is recommended that each individual lift station be inspected daily. This would simply include opening the wet-well, valve vault, and control panels to inspect for damage or any potential sources of clogging.

Alarm testing will be completed monthly upon startup of the lift station to ensure alarms are functioning properly. Valves in the wet-well should be exercised once per quarter to ensure they will work when needed.

Routine pump maintenance as described by the pump manufacturer will be included in the operation and maintenance of the lift station.

2.1.4 Engineering Features to Address Sanitary Sewer Overflows

Emergency storage, as required in the design criteria, will be designed into the wet-well to ensure there is adequate time for staff to respond and fix any issues. This emergency storage will also allow room for a portable submersible pump to be utilized if there are issues with the two (2) permanent submersible pumps that require long-term maintenance.

Two (2) pumps will be provided to ensure redundancy. In normal operation each pump will operate in a lead-lag fashion. Each pump will be capable of pumping 100% of the peak hour flow individually.

As previously mentioned, an alarm system will be included for the pumps. Alarms will include pump failure and a high wet-well level. Alarms will be visual, audible, and will be sent to the City of Alamosa staff by auto-dialer.

2.1.5 Emergency Preparedness

If an overflow is to occur, the emergency preparedness and response plan of City of Alamosa staff is essential. The design criteria requires that overflow storage of raw wastewater be provided at the lift station in the event of an extended power outage, electrical failure, mechanical failure, or force main interruptions. The overflow storage volume required must be sufficient to contain all wastewater during the period of time required to restore system operation, install temporary pumping capacity, or haul raw wastewater to an acceptable point of discharge. The wet-well is also required to provide a maximum of one hour of detention time at average flows.

City of Alamosa staff will assess each emergency event and respond accordingly. For example, in the case of a complete mechanical failure of all equipment, a portable pump will be installed temporarily, and flow will be bypassed to the nearby manhole which flows downstream of the lift station.

2.2 TELEMETRY AND ALARMS

Both lift stations will feature alarm systems for both pumps in each lift station, respectively. Alarms will be included for pump failure and high wet-well levels. Alarms will be visual, audible and will be sent to City of Alamosa staff by auto-dialer.

2.3 BACKUP POWER IDENTIFICATION

Lift Stations No. 3 and No. 6 have no dedicated on-site backup power provisions. If emergency power is needed, Alamosa staff will use a portable generator to provide power to the pump motors should either of these lift stations suffer a power failure.

2.4 PORTABLE EMERGENCY PUMPING EQUIPMENT

The City of Alamosa has access to portable pumps and generators that will be made available as needed in the event of a mechanical or electrical failure. The known lift stations that have overflowed in the past are No. 3 and No. 6. After the replacement of these lift stations, the District will no longer need to worry or be concerned about any of their nine lift stations overflowing regularly.

2.5 EMERGENCY STORAGE / OVERFLOW PROTECTION

There are no existing provisions for onsite emergency storage other than what is available in the lift station wet-well. Separate emergency overflow storage tanks will be provided as a part of the lift station upgrades.

2.6 OPERATOR CALL-DOWN LIST AND RESPONSE TIME JUSTIFICATION

The emergency phone number list includes emergency responders and City of Alamosa personnel. The main point of contact would be (719) 589-5807 which is Colorado State Patrol Dispatch. The CSP then contacts City of Alamosa personnel (24/7). Most of the maintenance personnel live within the City of Alamosa making response time short. The average response time is about 20 min after personnel receive the call from dispatch. The call-list provided by the City of Alamosa for the East Alamosa Water and Sanitation District is as follows:

EMERGENCY PHONE NUMBERS
East Alamosa Water and Sanitation District

District Office
719-589-2649

City of Alamosa
719-589-6631 or 719-589-2593

Colorado State Patrol Dispatch
719-589-5807

Police, Fire or Emergency
911 or 719-589-5807

Excel Energy/Power Outages
1-800-895-1999

Randy Martinez
719-589-6631

Roy Sanchez
719-588-9569 or 719-587-0432

WQCD 24HR. Incident Report Line
1-877-518-5608

3 MANAGEMENT CAPACITY

The City of Alamosa manages, operates, and maintains all lift stations and other facilities in the East Alamosa Water and Sanitation District by a general agreement between the two entities for many years. There is no need for additional staff for either East Alamosa Water or Sanitation District nor the City of Alamosa as the proposed project will actually reduce the operational intensity required by the City of Alamosa.

4 FINANCIAL CAPACITY

The purpose of this section is to provide sufficient evidence that the East Alamosa Water and Sanitation District has sufficient financial resources to construct the lift station replacements and cover any ongoing operational expenses. The most current budget information is attached in **Appendix F**.

Capital outlay and operational costs are covered by the enterprise fund. The financial analysis will focus on the enterprise fund.

The District currently has $700,000 budgeted for this project. The District anticipates that it will have approximately 50% of funding through the State Revolving Fund, 25% will come from Alamosa County from the American Rescue Plan Act of 2021 (ARPA) and 25% of the fund will come from the District's Enterprise budgeted expenses. Thus, the District currently has $175,000 in cash budgeted for this project. This equates to $700,000 in total funding in support of this project.

4.1 ITEMIZED PROJECTION OF EXPENSES AND REVENUE

An itemization of expenses and revenue is shown in the budget located in **Appendix F**. It is important to note that the District pays a flat fee to the City of Alamosa for all operations expenses. This includes any, and all, on-call expenses, and emergency response calls. As shown in the Enterprise Fund under the Cost of Goods Sold, the District has budgeted $57,500 in maintenance for the year of 2023.

As shown, the 2023 budget predicts total expenses to be $1,059,500 and yearly revenues to be $1,061,900. This equates to a balanced budget as is the District's yearly goal to maintain a balanced budget. It is important to note that this budget includes funding the proposed lift station improvement project as well as all required operation and maintenance costs.

4.2 COMPARISON OF EXPENSES AND REVENUE

According to the 2023 proposed budget, the East Alamosa Water and Sanitation District will maintain a sizeable Enterprise Fund reserve. This includes the one-time capital improvement expense to fund the proposed project. Further analyzing district expenses and revenue is not necessary, as the project will be funded through District cash on hand, and funds through the Infrastructure Investment and Jobs Act (IIJA) program and ARPA. As discussed, operating expenses will not change due to the maintenance agreement maintained between the District and the City of Alamosa.

4.3 ACCESS TO PUBLIC AND PRIVATE FINANCIAL CAPITAL

As a Colorado Special District, East Alamosa Water and Sanitation District has access to many options for funding, including rate revenues, CDPHE loans and grants, and funds from the ARPA.

4.4 CURRENT OUTSTANDING DEBT AND ABILITY TO BORROW FUNDS

The District is currently repaying two loans through the Colorado Water and Power Authority (CWPA) in the amount of $125,000 per year. This loan repayment is reflected under the heading of Items affecting the Balance Sheet.

As discussed, the proposed project will not encumber the district with any further debt obligations,

therefore an analysis of the District's outstanding debt and the ability to borrow funds is unnecessary.

4.5 PERIODIC FINANCIAL AUDITS

As a Colorado Special District, East Alamosa Water and Sanitation District must maintain yearly financial audits. All required audits have been completed as required.

4.6 ANNUAL DEVELOPMENT AND UTILIZATION OF BUDGETS

The District develops a budget each year and district board members vote on a resolution to adopt, amend, or reject the proposed budget. As shown in **Appendix F**, the budget has been developed and followed each year.

4.7 CAPITAL IMPROVEMENT PLAN

RGA prepared a Capital Improvement Plan (CIP) for East Alamosa Water and Sanitation District in 2012 and updated the CIP in 2013 and 2019. The updated 2019 CIP is attached in **Appendix G**.

5 LOCAL AGENCY REVIEW & POSTING OF SITE

As required by Regulation 22, both lift station sites have been posted.

6 CONSISTENCY WITH WATER QUALITY MANAGEMENT PLAN

Neither lift station service area is changing, therefore there will be no effect on any long-range comprehensive plans or water quality management plans.

7 BACKGROUND AND EXISTING LIFT STATION DESCRIPTION

7.1 LIFT STATION NO. 3

Lift Station No. 3, also known as the McKinney and McQuery Lift Station, was rehabilitated in 1995 and consists of a precast concrete wet-well, two (2) submersible non-clog pumps (Barnes Model No. 4SE1926L) rated at 130 GPM, and a pump control panel. As-built drawings from the 1995 improvements located in **Appendix F** show the pump motors as 1.9 HP 230V / 3 Phase / 60 HZ. The lift station picks up flows from Lift Station No. 4 directly to the north and residential gravity flows from the Lift Station No. 3 Contributing Area. It then discharges into a manhole through a 4-inch diameter force main approximately 40 feet to the south. A 6-inch diameter gravity sanitary line comes out of that manhole to the south and flows towards the manhole at Lift Station No. 2, bypassing Lift Station No. 9. The EAWSD Lift Stations Contributing Areas Exhibit can be seen in **Figure 1**.

Lift Station No. 3 is the most maintenance-intensive lift station in the District with maintenance required every two (2) weeks. This lift station has had overflows because the 6-inch gravity line from the downstream manhole into which the force main discharges is too small to handle the pumping of both pumps simultaneously. When pulled, both pumps must be disassembled, cleaned, un-clogged, reassembled, and reset on the rails before being lowered back into service. For the operators to remove the pumps, the rails have to be disconnected and rotated so the pumps can fit through the access hatch.

The location of Lift Station No. 3 is also a concern because it is in the middle of an intersection and does not have a traffic-rated access hatch. This continual maintenance caused by the overflowing of the lift station needs traffic control and creates unnecessary upkeep for the District. In addition to the regular maintenance issues caused by the overflowing of the lift station, other issues have been reported by the District's maintenance personnel, including deteriorated and rusted pump rails which complicates the raising of the pumps. The shallow depth and narrow diameter of the wet-well does not permit the required emergency overflow storage capacity.

7.2 LIFT STATION NO. 6

Lift Station No. 6, also known as the Rodeo Lift Station, was rehabilitated in 1995 and consists of a precast concrete wet-well, two (2) submersible non-clog pumps (Barnes Model No. 4SE1946L) rated at 75 GPM, and a pump control panel. As-built drawings from the 1995 improvements located in **Appendix F** show the pump motors as 1.9 HP 230V / 3 Phase / 60 HZ. The lift station picks up residential gravity flows from the Lift Station No. 6 Contributing Area. It then discharges into a downstream manhole approximately 925 feet to the west through a 4-inch diameter force main. A 6-inch diameter gravity sanitary line comes out of that manhole to the west and flows through three additional manholes along Santa Fe Avenue (Highway 160) before flowing into Lift Station No. 5. The EAWSD Lift Stations Contributing Areas Exhibit can be seen in **Figure 1**.

Lift Station No. 6 is the second most maintenance-intensive lift station in the District, with maintenance required every two (2) weeks. This lift station is close to capacity at about 92%. The downstream gravity line has a reverse grade, so the pipe does not actually allow for flow downstream until it becomes full. The upstream gravity-feed sanitary sewer lines also have substantial root

intrusion, which restricts flows out of the upstream manholes, causing them to overflow. When pulled, both pumps must be disassembled, cleaned, un-clogged, reassembled, and reset on the rails before being lowered back into service. The pumps need to be rewired with longer wires as they tend to get in the way during maintenance. Alamosa operators have also stated that the two (2) pumps in the lift station vary in size, but this has not been confirmed nor denied by the District. This continual maintenance caused by the reverse sloping of the downstream pipe and the near capacity of the lift station creates unnecessary upkeep for the District.

In addition to the regular maintenance issues caused by the overflowing of Lift Station No. 6, the District's maintenance personnel have reported other issues. These issues include deteriorated and rusted pump rails which complicate raising the pumps, the necessity of traffic control during the maintenance procedure, and the depth of the wet-well being too shallow.

Lift Station No. 6 will require an increase in pumping capacity as well as the addition of storage volume. The lift station service area has been developed along Femmer Road, with a mobile home park off Wild Acres Lane. If there is more expansion of the Lift Station No. 6 Contributing Area to the south of Santa Fe Avenue (Highway 160), contributing flows to Lift Station No. 6 may exceed its current capacity of 75 gallons per minute (GPM). The work-plan for Lift Station No. 6 is then to replace the existing lift station by constructing a new lift station with larger pumps, rails, chains, floats, wet-well, and control panel, and to increase the diameter of the gravity lines upstream. The lift station replacement will also include replacing the downstream gravity line that is currently at a reverse grade.

8 PROPOSED PROJECT SUMMARY

8.1 LIFT STATION NO. 3

Currently, Lift Station No. 3 does not require an increase in pumping capacity. However, the existing wet-well does not have adequate storage volume for one hour of peak flow, as required by *Colorado Design Criteria for Domestic Wastewater Treatment Works*. In addition, the sanitary sewer main directly downstream from Lift Station No. 3 needs to be upsized from 6-inches to 8-inches to handle flows from both pumps, simultaneously. The requirement of additional overflow storage will require a Site Application Amendment through CDPHE. The lift station service area, and that of the upstream lift station, is mostly built out. If the proposed apartment complex of thirty-two (32) multi-family units is constructed, the flow from the service area will not drastically change the peak inflows or require additional pumping capacity than what is currently available from the two (2) pumps in Lift Station No. 3.

The work-plan for Lift Station No. 3 is then to relocate and replace it, by constructing a new lift station with new pumps, rails, chains, floats, wet-well, and control panel, and increasing the diameter of all downstream gravity lines to manage the simultaneous pumping of both pumps. The lift station will be relocated to the south and out of the intersection, between the existing Lift Station No. 3 wet-well and the existing downstream manhole. The basis for installing a larger pipe in the downstream manhole is to decrease the inlet head at the pipe entrance, preventing the manhole from overflowing when receiving flows from both pumps at Lift Station No. 3.

The replacing of Lift Station No. 3 will consist of flow-filling a new manhole base in the existing wet-well and grouting in channels, converting it to a manhole that will collect all flows from the Lift Stations No. 3 and No. 4 contributing areas. These flows will be conveyed to a new, 6-foot diameter precast concrete wet-well with adequate depth to maintain desirable pump-run times and an additional manhole to provide overflow storage. Additionally, a 30-inch by 48-inch traffic-rated access hatch will be installed for easier system maintenance, two (2) new pumps and all ancillary equipment including rails, chains, and floats, and a new control panel installed in the same location as the old lift station. Lastly, the gravity collection pipes downstream from the new lift station will be replaced with 8-inch SDR35 PVC pipe.

8.2 LIFT STATION NO. 6

Lift Station No. 6 will require an increase in pumping capacity as well as the addition of storage volume. The lift station service area has been mostly developed along Femmer Road, with a mobile home park off Wild Acres Lane. If there is more expansion of the Lift Station No. 6 Contributing Area to the south of Santa Fe Avenue (Highway 160), contributing flows to Lift Station No. 6 may exceed its current capacity of 75 gallons per minute (GPM). However, we do not expect this to occur, especially within the next 20 years of service time.

The improvement of Lift Station No. 6 will consist of installing two (2) new 100 GPM pumps with all ancillary equipment, including rails, chains, and floats. These pumps will provide 33% more pumping capacity for Lift Station No. 6 and provide a greater factor of safety for the lift station. A new overflow well will also be installed adjacent to the existing wet-well proving additional storage for the system. A new control panel adjacent to the lift station will also be included. The wet-well will be constructed to an adequate depth to maintain desirable pump-run times, and the pipes upstream will be corrected and upsized.

Both proposed lift stations will be designed in accordance with the *Colorado Design Criteria for Domestic Wastewater Treatment Works, Chapter 4*. The design criteria for the proposed lift station are as follows:

8.3 LIFT STATION CHARACTERISTICS

A. Lift Station No. 3

- Two (2) 130 GPM pumps @ 7 ft TDH (Equal to the existing capacity)
- 8-ft or 6-ft diameter wet-well
- 1-hour wet-well detention time at initial operating conditions
- Minimum velocity in the force main shall be greater than 2 feet per second (FPS)

B. Lift Station No. 6

- Two (2) 100 GPM pumps @ 22 ft TDH (33% increase in pump capacity)
- 8-ft or 6-ft diameter wet-well
- 1-hour wet-well detention time at initial operating conditions
- Minimum velocity in the force main shall be greater than 2 FPS

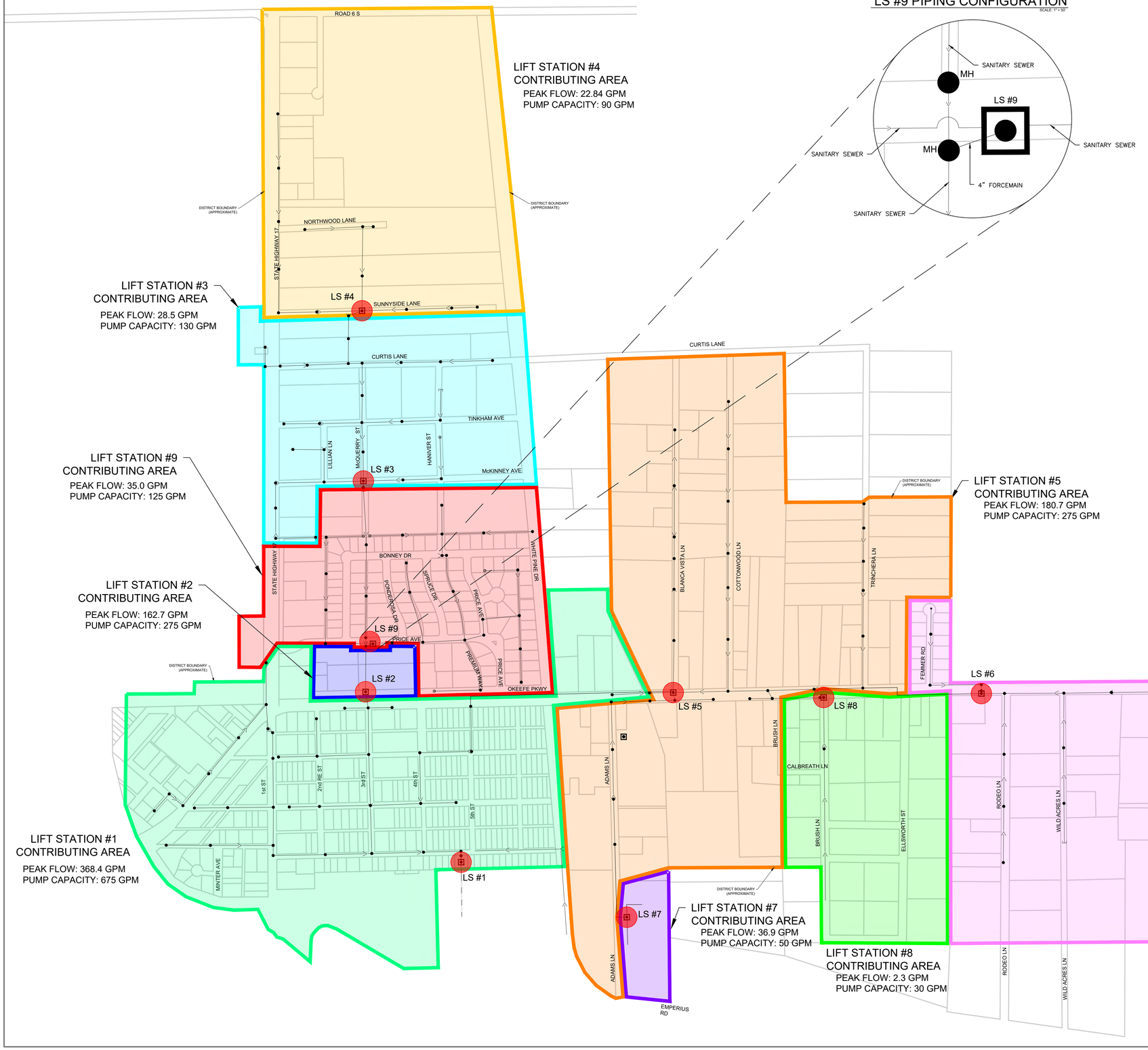
9 IMPLEMENTATION SCHEDULE AND PUBLIC NOTIFICATION

The anticipated construction of the proposed lift station is summer 2023.

Estimated Bid Opening Date: Spring 2023

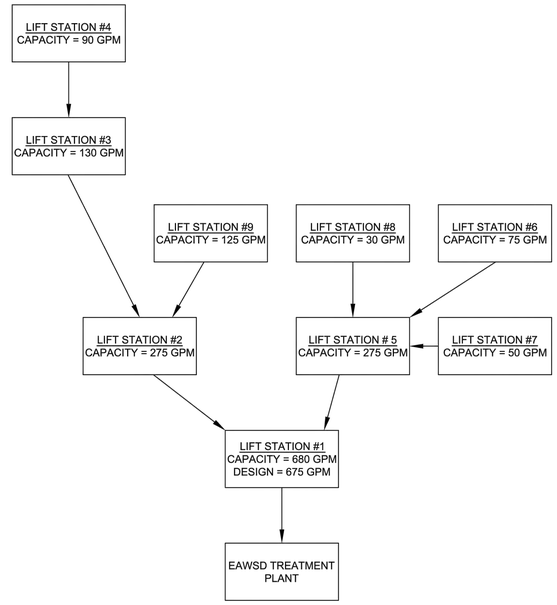
Estimated Completion Date: Fall 2023

APPENDIX A:
EAST ALAMOSA WATER AND SANITATION DISTRICT SERVICE AREA MAP



LS #9 PIPING CONFIGURATION

SCALE: 1" = 50'



EAWSD LIFT STATIONS FLOW DIAGRAM

SCALE: N.T.S.

LIFT STATION REPLACEMENT PRIORITES

PRIORITY	LIFT STATION #	LOCATION
1	3	MCKINNEY & MCQUERY
2	6	RODEO LANE
3	5	BLANCA VISTA LANE
4	4	SUNNY SIDE LANE
5	8	BRUSH LANE
6	9	PRICE AVENUE
7	7	ADAMS LANE

EAST ALAMOSA WATER AND SANITATION DISTRICT
2022 LIFT STATION ANALYSIS

RG AND ASSOCIATES, LLC
4885 Ward Road, Suite 100 • Wheat Ridge, CO • 80033
303-293-8107 • 303-293-8106 (fax) • www.rgengineers.com

LIFT STATIONS – CONTRIBUTING AREAS

JOB NUMBER: 1017.0010
DATE: AUGUST 2022
SCALE: 1" = 400'
SHEET NO: 1 of 1

APPENDIX B:
1995 PRELIMINARY ENGINEERING REPORT

PRELIMINARY ENGINEERING REPORT CONCERNING IMPROVEMENTS TO EAST ALAMOSA WATER & SANITATION DISTRICT SEWAGE COLLECTION SYSTEM

Prepared

March - May 1995

by

Davis Engineering Service, Inc.
576 Spruce Street, P.O. Box 130
Del Norte, Colorado 81132

Registered Engineer
Colorado Certificate No. 13340

I. INTRODUCTION

A. PURPOSE

The purpose of this report is to summarize sewage collection system infiltration/inflow information collected over the past several years and present recommendations for improvements to existing lift stations within the sewage collection system. The East Alamosa Water and Sanitation District, owner of the sewage collection system, has received funding for improvements.

B. SERVICE AREA

The East Alamosa Water and Sanitation District serves much of the densely populated area east of the Rio Grande that is not included in the City of Alamosa. Figure 1 is a topographic map of the area with the approximate boundaries of the District and the location of the existing lift stations shown. The service area is relatively level with a natural slope of approximately five feet per mile to the southeast. The soil is a fine grained alluvium. The District was organized in 1961.

The ground water level is shallow throughout the District. Seasonal high ground water levels usually occur in June with depths below ground surface of three feet or less in many areas. Ground water levels commonly decline two or more feet during the fall and winter compared to June depths.

According to the Flood Insurance Rate Map for Alamosa County, Colorado, nearly the entire District is within the 100 year flood plain. Superimposed on Figure 1 are boundaries of the 100 year flood plain within the District as shown on the Flood Insurance Rate Map.

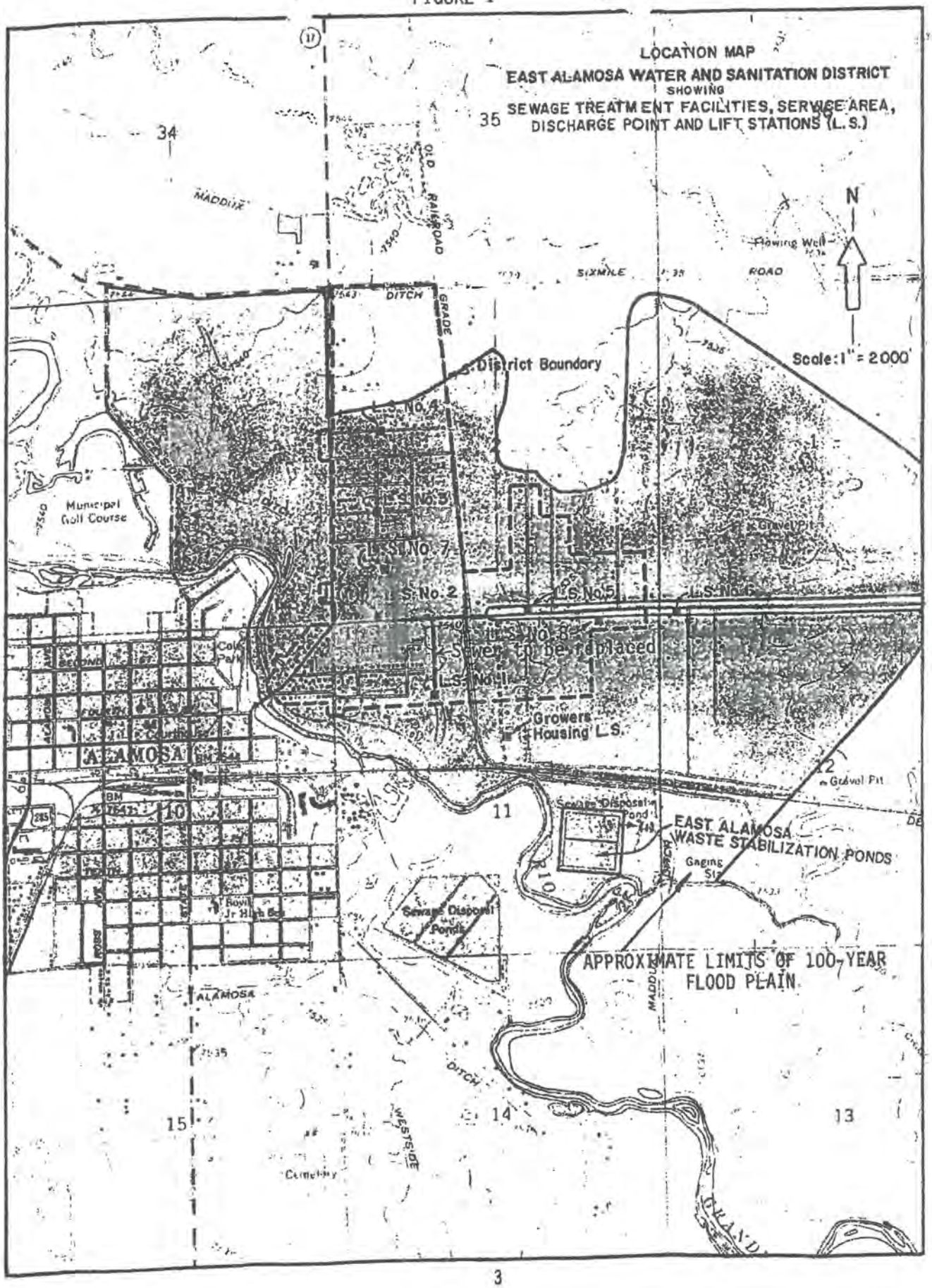
The population of the District as recorded in the 1990 census was 1,389 people. As part of the recently completed Alamosa 201 Plan, the following population projections were presented:

Table 1
POPULATION PROJECTION
East Alamosa Water and Sanitation District

Existing	20 Year Growth		Year 2011
Population	People	Annual Rate	Population
1,389	159	0.54%	1,548

The climate of the service area is dominated by cool summers, cold winters and little precipitation. Monthly average temperatures vary from ±16° F. in January to ±65° F. in July. Minimum temperatures can plunge to -40° F. and maximum summer temperatures usually do not exceed 90° F. Precipitation averages ±7 inches per year.

FIGURE 1


LOCATION MAP
EAST ALAMOSA WATER AND SANITATION DISTRICT
SHOWING
SEWAGE TREATMENT FACILITIES, SERVICE AREA,
DISCHARGE POINT AND LIFT STATIONS (L.S.)
N
Scale: 1" = 2000'
District Boundary
L.S. No. 1
L.S. No. 2
L.S. No. 3
L.S. No. 4
L.S. No. 5
L.S. No. 6
L.S. No. 7
L.S. No. 8
Sewer to be replaced
Growers Housing L.S.
EAST ALAMOSA WASTE STABILIZATION PONDS
Sewage Disposal Ponds
Gaging Sta.
APPROXIMATE LIMITS OF 100-YEAR FLOOD PLAIN
Municipal Golf Course
Gravel Pit
ALAMOSA
Cemetery
DITCH
OLD RAILROAD GRADE
SIXMILE ROAD
MADDUX DITCH
WESTSIDE DITCH
34
35
36
10
11
12
13
14
15

II. WASTEWATER COLLECTION SYSTEM INFILTRATION/INFLOW

A. EXISTING SEWAGE COLLECTION SYSTEM

The initial and largest portion of the sewage collection system was constructed in ±1962. Subsequent to the construction of the core system, at least three major expansions of the system and several minor expansion projects have been constructed. A project including extensions primarily to the east was completed in 1977. A project replacing the sewer in the Bonneyville Addition was completed in 1991. Following is a tabulation of approximate quantities of pipe and related appurtenances installed since 1962.

Table 2
QUANTITIES OF PIPE AND RELATED APPURTENANCES IN WASTEWATER COLLECTION SYSTEM

Collection System

Description	Quantity	Year Installed
10" V.C. Pipe	1,931	1962
8" V.C. Pipe	34,607	1962
6" V.C. Pipe	325	1962
8" C.I. Pipe Force Main	4,592	1962
Manholes	106	1973
8" Truss Pipe	3,801	1973
Manholes	23	1991
Clean outs	7	1991
8" PVC Pipe	7,502	1991

Lift Stations

Name/No.	Type	Capacity (g.p.m.)	Length/dia. Force Main	Total Dynamic Head (ft.)	
1	Wet Well w/Self-Priming Centrifugal Pumps	±329	4353'/8"	24.5	1973
Growers Housing	"	±50	500'/4"	28.0	1975
2	Wet Well w/Sub-mersible Pumps	±275	82'/4"	15.0	1982
3	"	±125	32'/4"	6.4	1962
4	"	±80	80'/4"	7.4	1962
5	"	±125	958/4"	29.2	1973

Name/No.	Type	Capacity (g.p.m.)	Length/dia. Force Main	Total Dynamic Head (ft.)	
6	Wet Well w/Self-Priming Centrifugal Pumps	±60	675'/4"	13.0	1973
7	Wet Well w/Sub-mersible Pumps	±125	10'/4"	9.0	1991
8	Wet Well w/Sub-mersible Pumps	±30	50'/2"	9.1	±1990

Collected wastewater flow is presently treated in a facultative lagoon system located in the southern portion of the District. The location is shown on Figure 1. The District has entered into a cooperative agreement with the City of Alamosa whereby their wastewater will be treated by the Alamosa regional treatment plant. The Alamosa regional treatment plant is presently under construction.

With the exception of the recently constructed lift station no. 7, lift stations within the system have been a serious maintenance problem for the District for the past several years. Lift station No. 1 is being replaced as part of the regional treatment plant project previously mentioned. The remaining lift stations are operating with old and in many cases inappropriately sized pumps. Electrical controls have corroded due to age and high humidity operating conditions. Growth within the District is heavily taxing the capacity of the lift stations with the exception of the Growers Housing lift station which has not experienced growth in recent years. Table 4 is a tabulation showing existing lift station capacities versus estimated existing peak flows and projected flows. Estimates of existing peak flows were derived by multiplying estimates of tributary homes by gallons per minute as suggested by design references and shown in the following table.

Table 3
LIFT STATION DESIGN GUIDELINES

No. of homes	g.p.m. capacity per home
30-200	1.0
200-450	0.9
450-600	0.8
Over 600	0.7

A peak collection system effluent flow of 254 g.p.m. was measured during June, 1991. This is equal to 0.52 g.p.m. per home based on 488 homes. Comparing the actual field measurement of 0.52 g.p.m. per home to the design guidelines in Table 3 indicates the guidelines are conservative and reasonable. Estimated future flows were calculated by applying the annual growth projection of 0.54% as included in the Alamosa 201 Plan.

Table 4
LIFT STATION CAPACITIES

Lift Station No.	Present Capacity (g.p.m.)	Estimated Tributary Homes	Estimated Present Peak Flow (g.p.m.)	Projected Tributary Homes	Projected Year 2011 Peak Flow (g.p.m.)
1	±329	488	390	544	435
2	±275	224	224	250	225
3	±125	101	101	113	113
4	±80	68	68	76	76
5	±125	163	163	182	182
6	±60	64	64	71	71
7	±125	105	105	117	117
8	±25	10	10	20	20
Growers Housing	±50	10	10	30	30

B. WASTEWATER FLOWS AND ESTIMATES OF INFILTRATION/INFLOW

Wastewater flow measurements have been conducted at three locations within the East Alamosa Water and Sanitation District sewage collection and treatment system. These locations include: 1) point of discharge from lagoons; 2) lift station pumping into lagoons (lift station No. 1); and 3) influent sewer pipe to lift station No. 1. Measurements at each of these locations will be discussed in the following paragraphs and then compared. Finally, the flow measurements will be compared to accepted standards used to determine if infiltration/inflow (I/I) is excessive within the District sewage collection system.

Wastewater Flow Measurement at Discharge Point from Lagoons

Wastewater effluent flow measurements have been collected at the lagoon discharge for numerous years as part of NPDES permit requirements. Flow measurement was accomplished with a Parshall flume with a six inch throat width. A tabulation of effluent flow data from the discharge point from the lagoons is presented in Table 5. The reporting of 1991 and portion of 1990 was selected because they are the most recent measurements that appear to be reliable. The District has experienced considerable problems obtaining accurate effluent flow measurements due to both equipment and operators.

Table 5
Wastewater Flow Measurement at Discharge Point from Lagoons

Date	Flow (M.G.D.)	G.P.C.P.D.
01/10/90	0.225	162.0
02/16/90	0.203	146.1
03/30/90	0.163	117.3
04/21/90	0.173	124.5
05/21/90	0.153	110.1
06/16/90	0.144	103.7
07/10/90	0.163	117.3
08/28/90	0.153	110.1
09/14/90	0.126	90.7
10/25/90	0.163	117.3
11/21/90	0.203	146.1
12/18/90	0.269	193.7
01/16/91	0.258	185.7
02/2/91	0.269	193.7
03/1/91	0.258	185.7
04/19/91	N.D.	N.D.
05/06/91	N.D.	N.D.
06/18/91	0.183	131.7

M.G.D. - Million Gallons per Day
N.D. - No Data
G.P.C.P.D. - Gallons per capita per day based on 1,389 people.

Wastewater Flow Measurement at Lift Station No. 1

During 1991 efforts were made to measure the wastewater pumped by lift station No. 1 which pumps all wastewater collected into the District's lagoons. Run-time meters were installed on the pumps and the discharge capacity of the lift station pumps was estimated. Monthly summaries of the measured flow are shown in Table 6.

Table 6
Wastewater Flow Measurements at Lift Station No. 1

Date	Average Flow (M.G.D.)	Highest Flow (M.G.D.)	Average G.P.C.P.D.
Jan. 1990	0.16	0.18	115.2
Feb. 1990	0.16	0.19	115.2
Mar. 1990	0.18	0.21	129.6
Apr. 1990	0.16	0.17	115.2
May 1990	0.14	0.19	100.8
June 1990	0.16	0.19	115.2
July 1990	0.14	0.16	100.8
Aug. 1990	0.16	0.19	115.2
Sept. 1990	0.16	0.17	115.2
Oct.1990	0.19	0.20	136.8
Nov. 1990	0.16	0.18	115.2
Dec. 1990	0.17	0.19	122.4
Jan. 1991	0.17	0.19	122.4

M.G.D. - Million Gallons per Day

Measurement Wastewater Flow in Influent Sewer Pipe at Lift Station No. 1

As a result of uncertainties concerning accuracy of lift station measurements, measurements of the flow in the influent sewer pipe at lift station No. 1 was conducted for two periods in 1991. Measurements were taken for a two week period during high ground water and taken for a one week period during low ground water. The object of the two measurement periods was to obtain an estimate of ground water infiltration into the sewers by comparing the wastewater flows during the two ground water conditions.

The measurements were made with a Marsh-McBirney electronic flow meter installed in the pipeline through a manhole immediately upstream of the lift station. This type of flow meter measures the depth and velocity of flow and calculates the volume per unit of time. It is designed so it accurately measures pipe flow during open channel and surcharged conditions. Table 7 presents daily measurements and other statistical information.

Table 7
Wastewater Flow Measurements in Influent Sewer Pipe at Lift Station No. 1

Flow Measurement During High Ground Water Table					
	LENGTH OF DAILY MEASUREMENT	FLOW			
		TOTAL	AVERAGE	POP=1389	7 DAY AVERAGE
DATE	HRS.	Gals/Day	Gals./hr.	G.P.C.P.D.	G.P.C.P.D.
6/07/91	11	108,630	9,875.5	171	
6/08/91	24	199,820	8,325.8	144	
6/09/91	24	230,560	9,606.7	166	
6/10/91	24	236,050	9,835.4	170	
6/11/91	24	228,800	9,533.3	165	
6/12/91	24	232,140	9,672.5	167	
6/13/91	24	231,260	9,635.8	167	164
6/14/91	24	218,270	9,094.6	157	162
6/15/91	24	242,650	10,110.4	175	167
6/16/91	24	233,680	9,736.7	168	167
6/17/91	24	248,610	10,358.8	179	168
6/18/91	24	230,090	9,587.1	166	168
6/19/91	24	229,110	9,546.3	165	168
6/20/91	24	220,380	9,182.5	159	167
6/21/91	11	93,310	8,482.7	147	165
14 DAY AVERAGE				164	
Flow Measurement During Low Ground Water Table					
9/13/91	7	44,450	6,350.0	110	
9/14/91	24	147,070	6,127.9	106	
9/15/91	24	59,840	2,493.3	43	
9/16/91	24	72,960	3,040.0	53	
9/17/91	24	95,820	3,992.5	69	
9/18/91	24	90,450	3,768.8	65	
9/19/91	24	102,690	4,278.8	74	74
9/20/91	10	39,920	3,992.0	69	68
8 DAY AVERAGE				74	

G.P.C.P.D. - Gallons per capita per day
POP - Population

Comparison of Wastewater Flow Measurements

Of the three wastewater flow measurement locations, the flows at lift station No. 1 and flows in influent pipe to lift station No. 1 should be comparable, however sewage and evaporation from the lagoon will influence measurements at the lagoon discharge. Comparisons of the measurements using gallons per capita per day (G.P.C.P.D.) units are presented in Table 8.

Table 8
Comparison of Wastewater Flow Measurements
From Three Locations

	G.P.C.P.D. @ lagoon discharge		G.P.C.P.D. @ Influent to Lift Station No. 1	G.P.C.P.D. @ Lift Station No. 1
Date	Date	Flow	Flow	Flow
Jan. 1990	01/10/90	162		115
Feb. 1990	02/16/90	146		115
Mar. 1990	03/30/90	117		130
Apr. 1990	4/21/90	125		115
May 1990	05/21/90	110		101
June 1990	06/16/90	104	164.2*	115
July 1990	07/10/90	117		101
Aug. 1990	08/28/90	110		115
Sept. 1990	09/14/90	91	73.5*	115
Oct. 1990	10/25/90	117		137
Nov. 1990	11/21/90	146		115
Dec. 1990	12/18/90	194		122
Jan. 1991	01/16/91	186		122

* 7 to 14 day averages.

Gallons per capita per day (GPCPD) were calculated for each measurement period to allow comparison with Environmental Protection Agency's (EPA) guidelines regarding excessive infiltration/inflow in the sewer system. In simple form, EPA's guidelines indicate excessive I/I may exist in a sewer system if maximum flows exceed 120 g.p.c.p.d.. If it is less expensive to treat the existing wastewater flow than reduce I/I so maximum flows do not exceed 120 g.p.c.p.d., reduction in I/I is not required for compliance with EPA guidelines. The average flow at lift station No. 1 influent during the high ground water measurement period was ±164

g.p.c.p.d.. Considering measurement methods and personnel involved, this data is felt to be the most reliable. Referencing data in Table 7, it is evident that excessive I/I was present in the sewer collection system during this period of high ground water. There was no precipitation during the June 1990 measurement period, so the source of I/I was primarily ground water infiltration.

During periods of high ground water most of the sewage collection system piping is below the water table. A large part of the collection system is constructed of old vitrified clay pipe with joints every 5½ or 6 feet. Based on records of installed clay pipe, it is estimated that there are at least 6,500 joints. The writer's experience with clay pipe collection systems indicates that ground water infiltration is almost certainly wide spread throughout the system. Correction of the wide spread infiltration is likely to require replacement of the old part of the collection system. Appendix A includes a preliminary estimate of costs to replace this old portion of the existing sewer system.

Although measurement accuracy is questionable at the lagoon discharge, it appears that high flows occurred during the winter months. Interviews with residents indicate that running water taps in the winter to prevent pipe freezing is not uncommon. This practice is likely to be the reason for the high wastewater flows.

III. PROPOSED IMPROVEMENTS

Due to poor operating conditions and the inadequate capacity, replacement of all mechanical and electrical components are proposed for lift stations No's. 2, 3, 4, 5, 6, 8 and Growers Housing. Repair and cleaning of lift station wet wells and piping is also proposed. Lift station No. 1 is being replaced as part of the Alamosa regional wastewater treatment plant project. Lift station No. 7 is only ±4 year old and has adequate capacity for future growth. In Table 9, recommended pumping capacities and preliminary cost estimates are presented. Enlargement of lift station No. 5 causes a section of the existing sewage collection system between the force main discharge and lift station No. 1 to reach its maximum capacity. Replacement of ±400 feet of existing 8" sewer and construction of 800 feet of new sewer is proposed to correct this overloading. The new 1,200 feet of sewer will be 10" diameter and includes three new manholes. The location of the sewer to be replaced is shown on Figure 1. An alternate that should be considered during design is extension of the force main to lift station No. 1 rather replacement of the sewer.

Table 9
PRELIMINARY COST ESTIMATES
FOR
WASTEWATER LIFT STATION IMPROVEMENTS

Lift Station No.	Proposed Capacity (g.p.m.)	Estimated Total Dynamic Head (ft.)	Estimated Cost
2	300	14	50,000
3	150	7	20,000
4	125	8	18,000
5	200	55	24,000
6	125	22	15,000
8	30	9	15,000
Growers Housing	75	14	15,000
1,200 feet of 10" dia. sewer @ $15/ft.			18,000
3 manholes @ $1,500 each			4,500
Total Estimated Construction Cost			179,500
Engineering @ 11.5%			20,643
Inspection @ 6%			10,770
Contingency @ 10%			17,950
Total Estimated Project Cost			$228,863

IV. RECOMMENDATION AND CONCLUSIONS

There is clear evidence that improvement of lift stations is necessary as soon as possible. Delay in proceeding with such improvements will result in the continuation of excessive high maintenance costs and significant inconvenience and possible property damage to residents when lift stations fail. It is recommended that lift station improvements as tabulated in Table 9 be accomplished as soon as reasonably possible.

With measured wastewater flows of ±164 g.p.c.p.d., there is evidence that infiltration/inflow in the sewage collection system exceeds EPA's guidelines of 120 g.p.c.p.d. . Costs for treatment of existing flows have been estimated as part of the regional treatment facility agreement with the City of Alamosa. The projected annual cost is based on current flows and includes two components. The components are a share of the treatment plant construction cost and the operation and maintenance cost. A tabulation showing the components and the total annual cost

of $54,500 is included in Appendix A. Details used to derive a calculated annual cost of $136,553 for repayment of the loan for replacement of the old portion of the sewage collection system is also included in Appendix A. If I/I was reduced from the existing 164 g.p.c.p.d. to 120 g.p.c.p.d. as a result of the replacement of the old portion of the collection system, the regional treatment cost share would be reduced by [(164-120)/164 x 100] = 26.8%. This reduction in both loan and O&M would result in a ($54,500 x 0.268) = $14,622 per year treatment cost savings. Since a $136,553 annual cost would be necessary to reduce I/I which would result in a savings of $14,622 per year in treatment costs, it is clearly more cost effective to treat the extra I/I than reduce it through replacement of the sewers.

APPENDIX A
PRELIMINARY COST ESTIMATE TO REPLACE EXISTING
OLD PORTION OF SEWAGE COLLECTION SYSTEM

Item	Quantity	Unit	Unit Cost	Extension
10" PVC sewer pipe	1,931	l.f.	17	32,827
8" PVC sewer pipe	35,132	l.f.	15	526,980
8" PVC force main	4,592	l.f.	10	45,920
Manhole	106	ea.	1,500	159,000
Sewer service connection	300	ea.	150	45,000
Highway or Railroad Crossing	9	ea.	20,000	180,000
	Estimated Construction Cost			989,727
	Engineering @ 8%			79,178
	Construction Review @ 5%			49,486
	Legal & Bond Counsel @ 3%			29,692
	Contingency @ 10%			98,973
	Total Estimated Project Cost			$1,247,056

Loan Repayment Estimate:

Estimated required loan = $1,247,056
Interest rate per period (i) = 9%
Number of interest periods (n) = 20 year
Capital recovery factor = $\frac{i(1+i)^n}{(1+i)^n-1}$ = 0.1095

Annual loan payment = $1,247,056 x 0.1095 = $136,552.63

Cost for Treatment of Existing Wastewater Flows at Alamosa Regional Treatment Facility:

Estimated connection charge (required loan) = $315,317
Estimated required loan = $315,317
Interest rate per period (i) = 9%
Number of interest periods (n) = 20 year

Capital recover factor = $\frac{i(1+i)^n}{(1+i)^n-1}$ = 0.1095

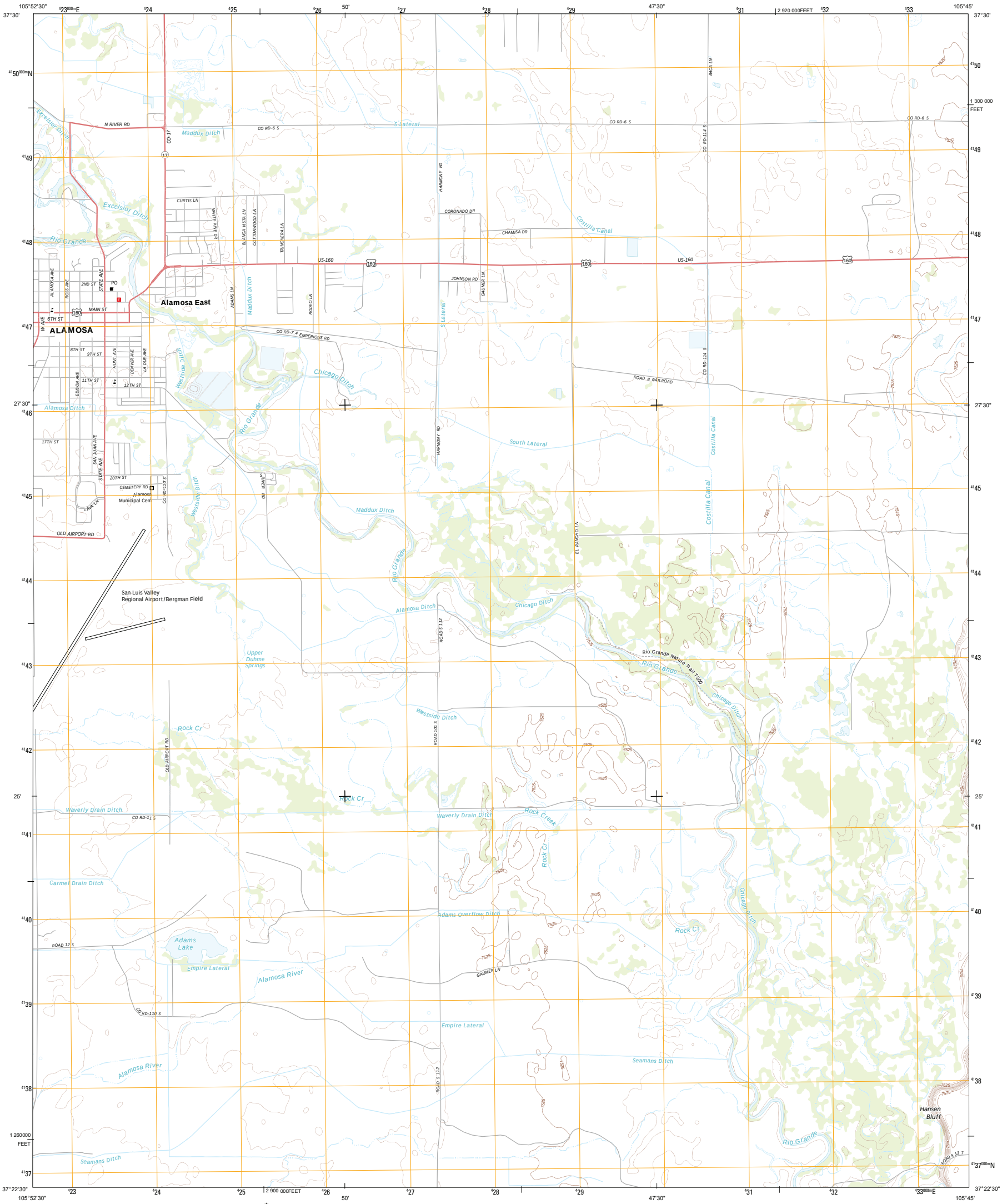
Annual loan payment = $315,317 x 0.1095 = $34,527.21
Annual Estimated O&M Costs = 20,000.00
Estimated Total Cost = $54,527.12

APPENDIX C:
USGS TOPOGRAPHICAL MAP
USGS WEB SOILS SURVEY

U.S. DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

The National Map US Topo

ALAMOSA EAST QUADRANGLE
COLORADO-ALAMOSA CO.
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid: Universal Transverse Mercator, Zone 13S
10 000-foot ticks: Colorado Coordinate System of 1983 (south zone)

Imagery.....NAIP, August 2011
Roads.....©2006-2012 TomTom
Names.....GNIS, 2013
Hydrography.....National Hydrography Dataset, 2011
Contours.....National Elevation Dataset, 2012
Boundaries.....Census, IBWC, IBC, USGS, 1972 - 2012
Public Land Survey System.....BLM, 2011

UTM GRID AND 2013 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET
MN 8° 55' 158 MILS
GN 0° 30' 9 MILS

U.S. National Grid
100,000-m Square ID: DB
Grid Zone Designation: 13S

SCALE 1:24 000
1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 MILES 1
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 FEET

CONTOUR INTERVAL 5 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.14

COLORADO
QUADRANGLE LOCATION

Mount Pleasant School	Hooper SE	Dry Lakes
Alamosa West	Alamosa East	Baldy
La Jara	Pikes Stockade	Lasauses

ADJOINING 7.5' QUADRANGLES

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

ALAMOSA EAST, CO
2013

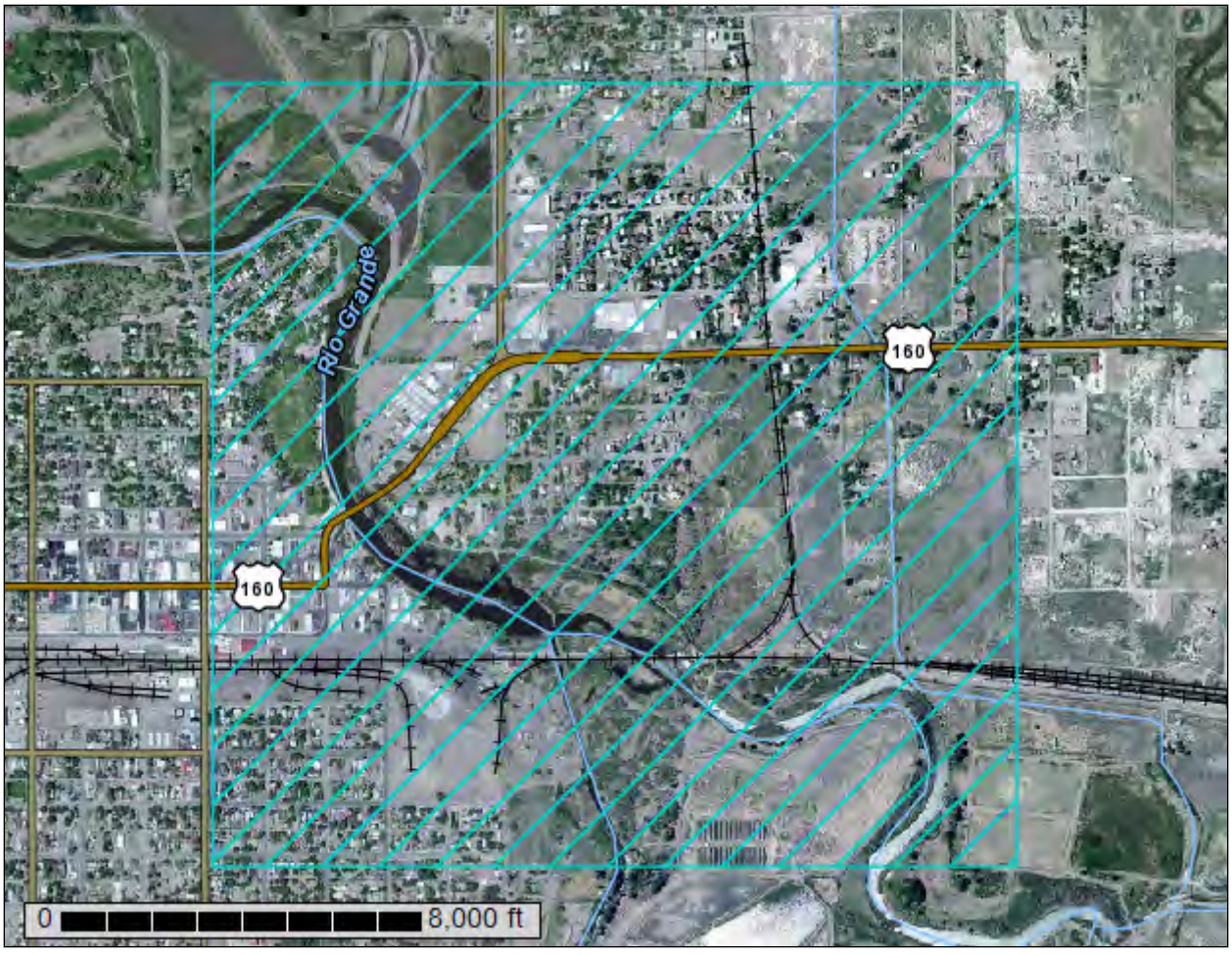
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Alamosa Area, Colorado



January 6, 2014

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

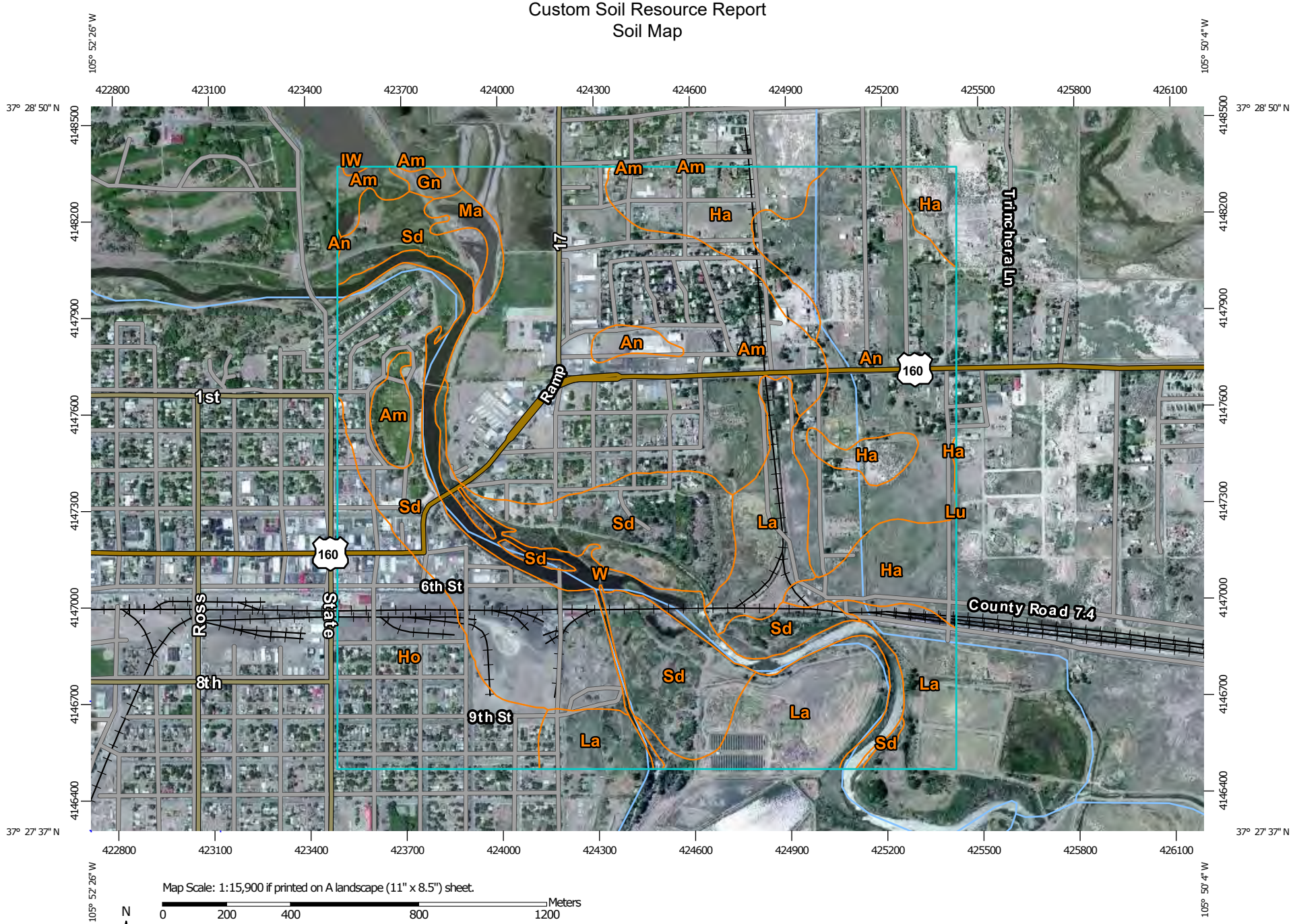
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alamosa Area, Colorado
Survey Area Data: Version 7, Aug 17, 2009

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2010—Oct 1, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Alamosa Area, Colorado (CO632)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
Am	Alamosa loam	221.0	24.6%
An	Alamosa loam, saline	124.6	13.9%
Gn	Gunbarrel loamy sand	3.3	0.4%
Ha	Hapney loam	81.2	9.0%
Ho	Hooper loamy sand	87.2	9.7%
IW	Intermittent water	0.3	0.0%
La	LaJara loam	114.9	12.8%
Lu	Loamy alluvial land	0.1	0.0%
Ma	Marsh	8.2	0.9%
Sd	Sandy alluvial land	214.4	23.9%
W	Water	42.4	4.7%
Totals for Area of Interest		**897.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with

some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Alamosa Area, Colorado

Am—Alamosa loam

Map Unit Setting

Elevation: 7,600 to 8,000 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 39 to 43 degrees F
Frost-free period: 90 to 110 days

Map Unit Composition

Alamosa and similar soils: 85 percent

Description of Alamosa

Setting

Landform: Channels, oxbows, swales, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 12 to 18 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to moderately saline (2.0 to 16.0 mmhos/cm)
Available water capacity: High (about 11.0 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated and reclaimed of excess salts and sodium
Land capability classification (irrigated): 4w
Land capability (nonirrigated): 7c
Hydrologic Soil Group: D
Ecological site: Wet Meadow (R051XY315CO)

Typical profile

0 to 8 inches: Loam
8 to 55 inches: Clay loam
55 to 65 inches: Loam

An—Alamosa loam, saline

Map Unit Setting

Elevation: 7,600 to 8,000 feet

Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 39 to 43 degrees F
Frost-free period: 90 to 110 days

Map Unit Composition
Alamosa, saline, and similar soils: 85 percent
Minor components: 5 percent

Description of Alamosa, Saline

Setting
Landform: Flood plains, swales, oxbows, channels
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 12 to 18 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to moderately saline (2.0 to 16.0 mmhos/cm)
Available water capacity: High (about 11.0 inches)

Interpretive groups
Farmland classification: Prime farmland if irrigated and reclaimed of excess salts and sodium
Land capability classification (irrigated): 4s
Land capability (nonirrigated): 7c
Hydrologic Soil Group: D
Ecological site: Salt Meadow (R051XY267CO)

Typical profile
0 to 8 inches: Loam
8 to 55 inches: Clay loam
55 to 65 inches: Loam

Minor Components

Hapney
Percent of map unit: 5 percent

Gn—Gunbarrel loamy sand

Map Unit Setting
Elevation: 7,500 to 7,800 feet

Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 39 to 41 degrees F
Frost-free period: 65 to 100 days

Map Unit Composition
Gunbarrel and similar soils: 85 percent
Minor components: 10 percent

Description of Gunbarrel

Setting
Landform: Flood plains on valley floors
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 54 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Available water capacity: Low (about 4.1 inches)

Interpretive groups
Farmland classification: Farmland of unique importance
Land capability classification (irrigated): 4w
Land capability (nonirrigated): 7w
Hydrologic Soil Group: A
Ecological site: Salt Flats (R051XY263CO)

Typical profile
0 to 48 inches: Loamy sand
48 to 60 inches: Loamy coarse sand

Minor Components

Mosca
Percent of map unit: 5 percent

Mcginty
Percent of map unit: 5 percent

Ha—Hapney loam

Map Unit Setting
Elevation: 7,600 to 8,000 feet

Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 39 to 43 degrees F
Frost-free period: 90 to 110 days

Map Unit Composition
Hapney and similar soils: 85 percent
Minor components: 10 percent

Description of Hapney

Setting
Landform: Flood plains on valley floors
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 48 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Very slightly saline to slightly saline (4.0 to 8.0 mmhos/cm)
Available water capacity: Low (about 6.0 inches)

Interpretive groups
Farmland classification: Not prime farmland
Land capability classification (irrigated): 4s
Land capability (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: Salt Flats (R051XY263CO)

Typical profile
0 to 2 inches: Loam
2 to 23 inches: Clay
23 to 40 inches: Sandy clay loam
40 to 60 inches: Loamy sand

Minor Components

Hooper
Percent of map unit: 5 percent

Alamosa, saline
Percent of map unit: 5 percent
Landform: Swales, flood plains, channels, oxbows
Other vegetative classification: SALT MEADOW (051XY267CO_2)

Ho—Hooper loamy sand

Map Unit Setting

Elevation: 7,600 to 7,800 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 39 to 43 degrees F
Frost-free period: 110 to 150 days

Map Unit Composition

Hooper and similar soils: 85 percent
Minor components: 10 percent

Description of Hooper

Setting

Landform: Flood plains on valley floors
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Slightly saline to moderately saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 60.0
Available water capacity: Very low (about 2.9 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 6s
Land capability (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: Salt Flats (R051XY263CO)

Typical profile

0 to 7 inches: Loamy sand
7 to 16 inches: Clay
16 to 32 inches: Sandy clay loam
32 to 60 inches: Sand

Minor Components

San luis
Percent of map unit: 5 percent

Hooper
Percent of map unit: 5 percent
Landform: Flood plains on valley floors

IW—Intermittent water

Map Unit Composition
Intermittent water: 100 percent

Description of Intermittent Water

Setting
Landform: Valley floors
Down-slope shape: Linear
Across-slope shape: Linear

La—LaJara loam

Map Unit Setting
Elevation: 7,600 to 8,200 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 100 days

Map Unit Composition
Lajara and similar soils: 70 percent
Minor components: 10 percent

Description of Lajara

Setting
Landform: Flood plains on valley floors
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 6 to 30 inches

Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water capacity: Moderate (about 6.9 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated and reclaimed of excess salts and sodium
Land capability classification (irrigated): 4w
Land capability (nonirrigated): 5w
Hydrologic Soil Group: D
Ecological site: Wet Meadow (R051XY315CO)

Typical profile

0 to 10 inches: Loam
10 to 50 inches: Stratified sandy loam to loam
50 to 60 inches: Sand

Minor Components

Nortonville

Percent of map unit: 5 percent

Vastine

Percent of map unit: 5 percent
Landform: Flood plains
Ecological site: Wet Meadow (R051XY315CO)

Lu—Loamy alluvial land

Map Unit Setting

Elevation: 5,000 to 8,000 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 39 to 48 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition

Loamy alluvial land: 85 percent
Minor components: 10 percent

Description of Loamy Alluvial Land

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Properties and qualities

Slope: 0 to 1 percent

Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: Occasional
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to slightly saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water capacity: Moderate (about 7.6 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 7w
Hydrologic Soil Group: D
Ecological site: Wet Meadow (R051XY315CO)

Typical profile

0 to 36 inches: Clay loam
36 to 60 inches: Sand

Minor Components

Alamosa, saline

Percent of map unit: 5 percent
Landform: Oxbows, swales, flood plains, channels
Other vegetative classification: SALT MEADOW (051XY267CO_2)

Homelake

Percent of map unit: 5 percent
Landform: Flood plains
Ecological site: Wet Meadow (R051XY315CO)

Ma—Marsh

Map Unit Setting

Elevation: 3,000 to 6,000 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 80 to 175 days

Map Unit Composition

Marsh: 100 percent

Description of Marsh

Setting

Landform: Swamps, marshes, playas
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Properties and qualities

Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (0.20 to 20.00 in/hr)
Depth to water table: About 12 to 48 inches
Frequency of flooding: Frequent
Maximum salinity: Nonsaline to slightly saline (0.0 to 8.0 mmhos/cm)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 7w
Hydrologic Soil Group: D

Typical profile

0 to 60 inches: Variable

Sd—Sandy alluvial land

Map Unit Setting

Elevation: 5,800 to 8,000 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 90 to 130 days

Map Unit Composition

Sandy alluvial land: 100 percent

Description of Sandy Alluvial Land

Setting

Landform: Channels, oxbows
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Properties and qualities

Slope: 0 to 1 percent
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: About 12 to 42 inches
Frequency of flooding: Frequent
Available water capacity: Low (about 4.3 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 7w
Hydrologic Soil Group: D

Typical profile

0 to 15 inches: Gravelly sandy loam
15 to 60 inches: Stratified very gravelly sand to sandy loam

W—Water

Map Unit Composition

Water: 100 percent

Description of Water

Setting

Landform: Valley floors
Down-slope shape: Linear
Across-slope shape: Linear

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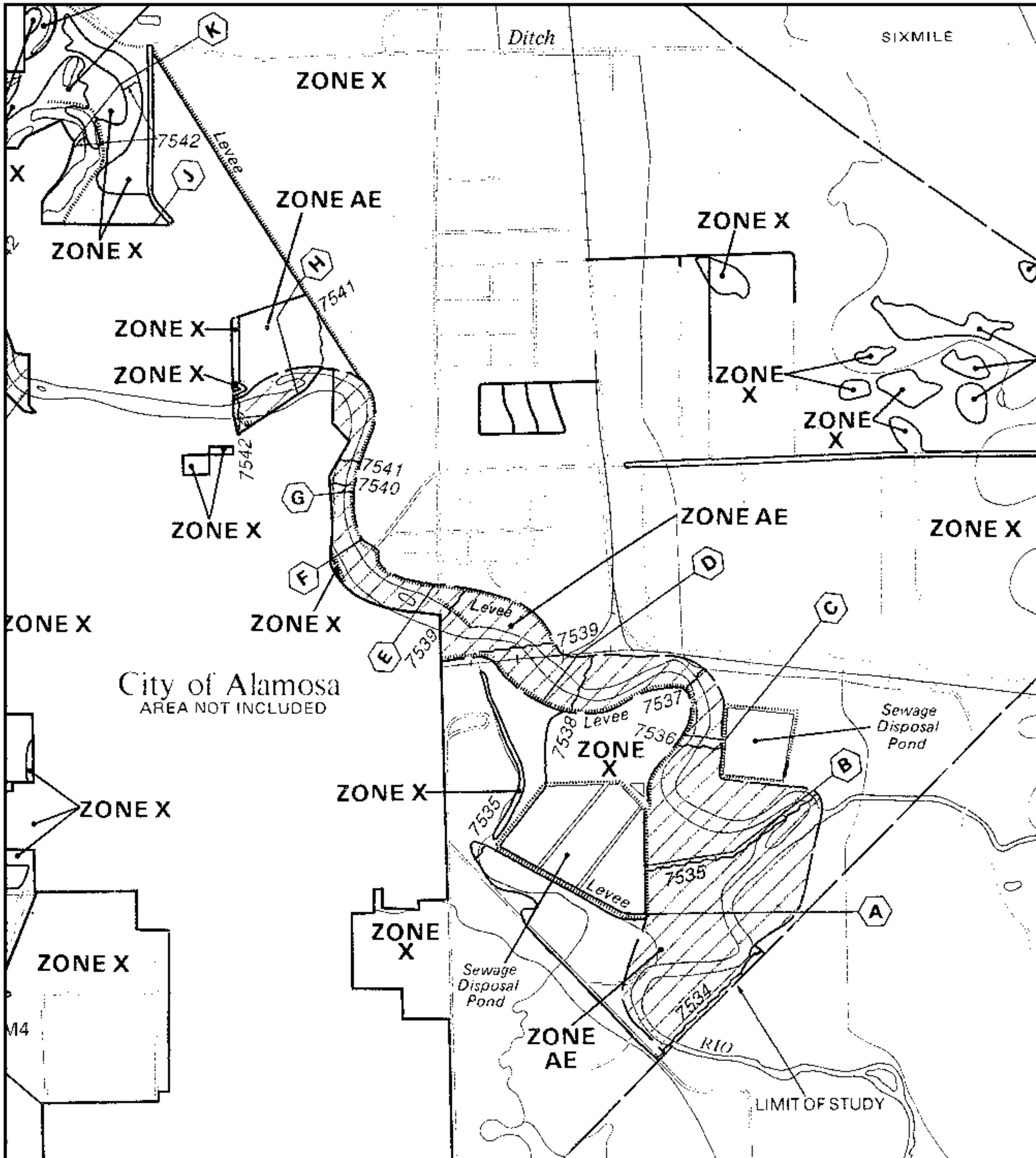
APPENDIX D:
FLOOD INSURANCE RATE MAP
NATIONAL WETLANDS INVENTORY MAP
1-MILE RADIUS MAP
5-MILE RADIUS MAP



N

APPROXIMATE SCALE IN FEET

2000 0 2000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

ALAMOSA COUNTY,
COLORADO
(UNINCORPORATED AREAS)

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
080009 0045 B

MAP REVISED:
APRIL 21, 1999

Federal Emergency Management Agency

U.S. Fish and Wildlife Service

National Wetlands Inventory

Wetlands Mapping

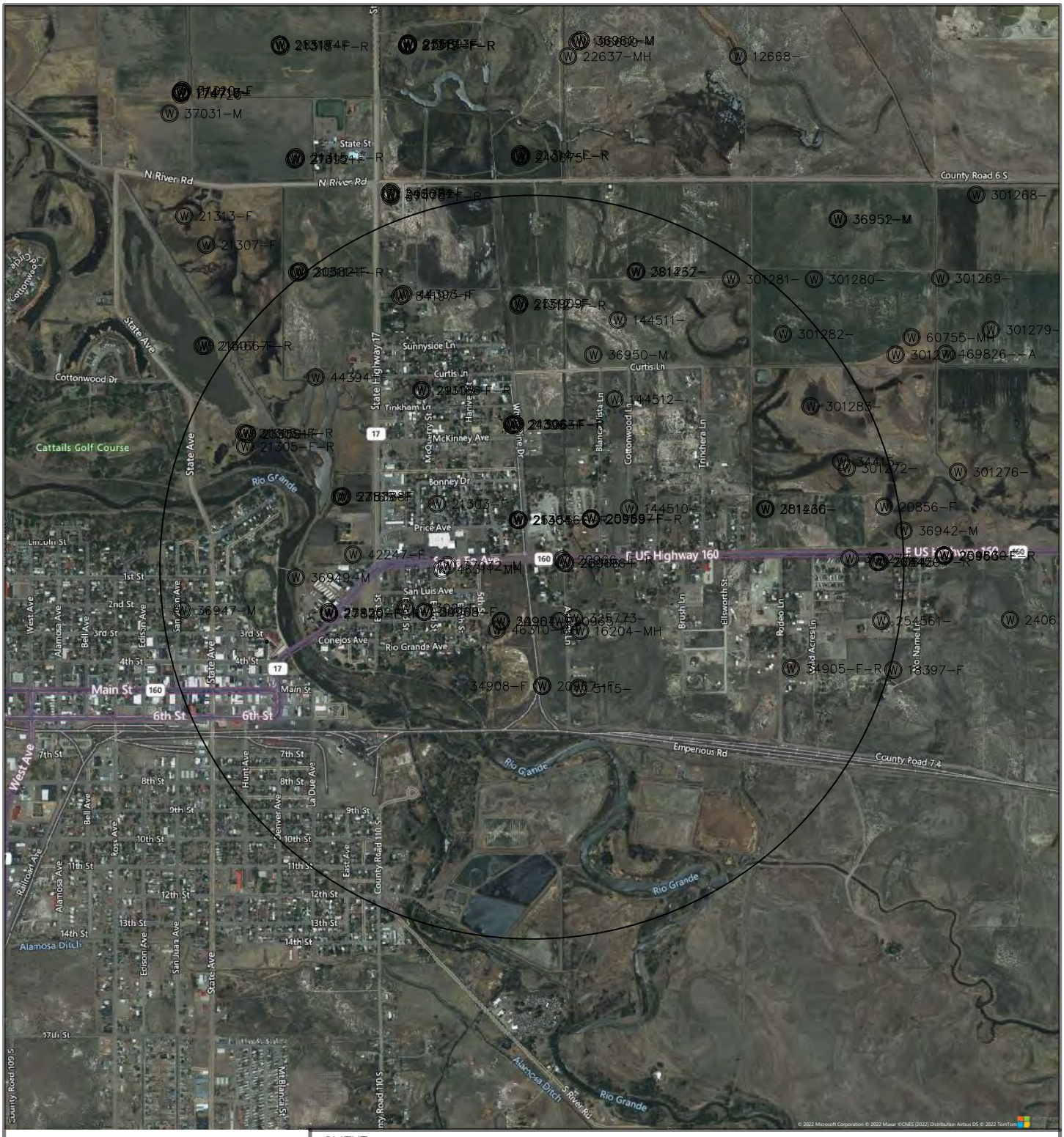
Jul 23, 2013

Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

User Remarks:

EAWSD – 2023 LIFT STATION REPLACEMENT



LEGEND

W 169826–	WELL PERMIT #
◯	1-MILE RADIUS

CLIENT:
EAST ALAMOSA WATER AND SANITATION DISTRICT

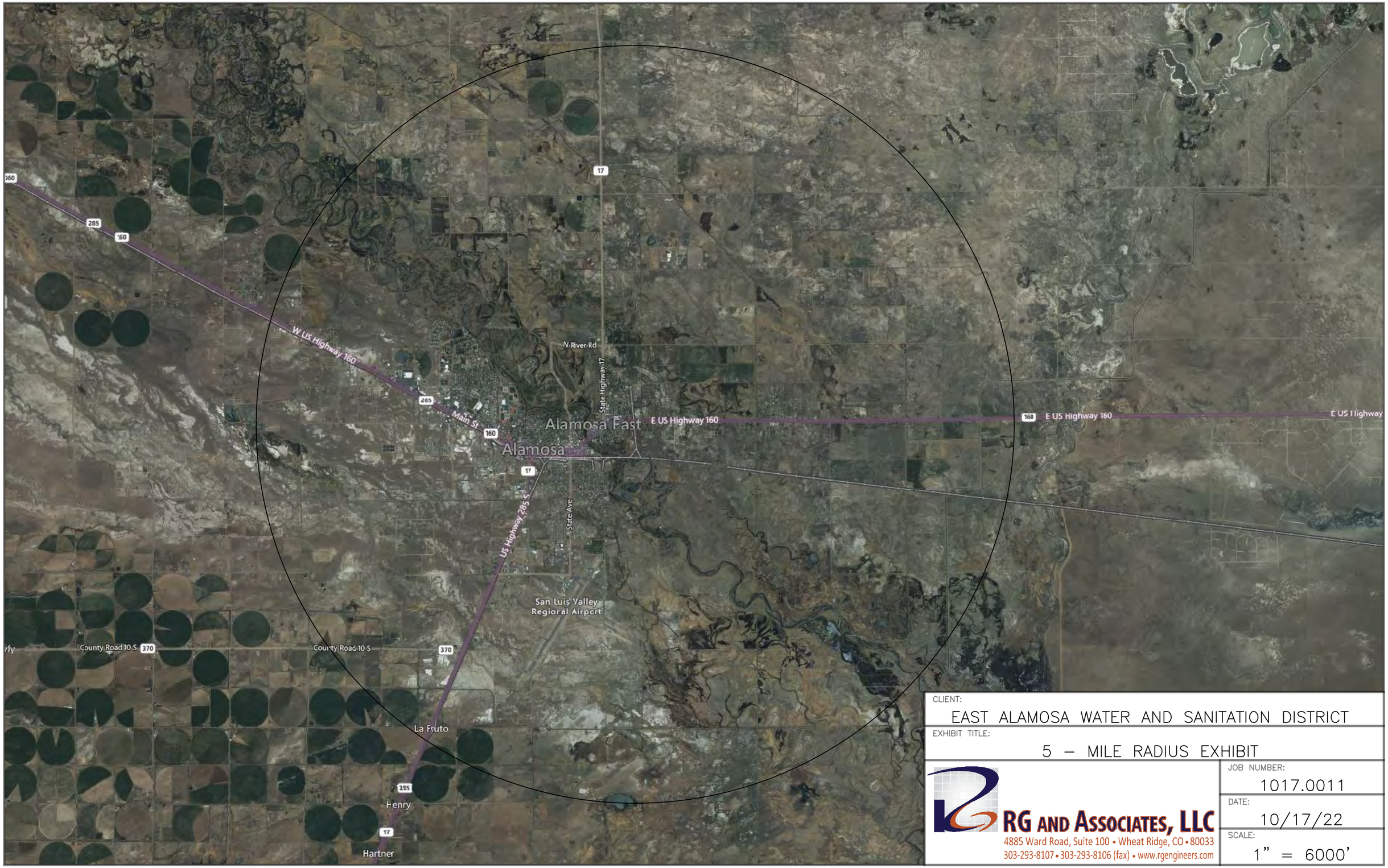
EXHIBIT TITLE:
1–MILE RADIUS EXHIBIT

RG AND ASSOCIATES, LLC
4885 Ward Road, Suite 100 • Wheat Ridge, CO • 80033
303-293-8107 • 303-293-8106 (fax) • www.rgengineers.com

JOB NUMBER: 1017.0011

DATE: 11/4/22

SCALE: 1" = 2000'



CLIENT:
EAST ALAMOSA WATER AND SANITATION DISTRICT

EXHIBIT TITLE:
5 – MILE RADIUS EXHIBIT

RG AND ASSOCIATES, LLC
4885 Ward Road, Suite 100 • Wheat Ridge, CO • 80033
303-293-8107 • 303-293-8106 (fax) • www.rgengineers.com

JOB NUMBER: 1017.0011

DATE: 10/17/22

SCALE: 1" = 6000'

APPENDIX E:
LIFT STATION SITE PLANS

PLANS FOR THE

EAST ALAMOSA LIFT STATION IMPROVEMENT PROJECT

FOR THE
EAST ALAMOSA WATER & SANITATION DISTRICT
ALAMOSA COUNTY, COLORADO

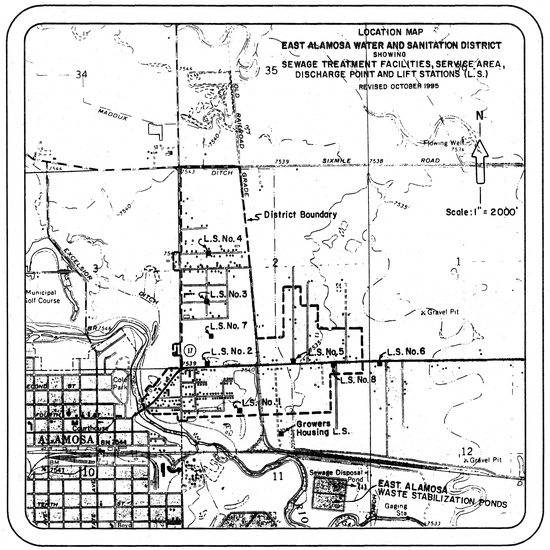
PREPARED NOVEMBER 1995

BY

DAVIS ENGINEERING SERVICE, INC.
576 SPRUCE STREET – P.O.BOX 130
DEL NORTE, COLORADO 81132

LEGEND

– – – – – – – –	SEWER PIPELINE
– · – · – · – · –	FORCE MAIN
— — — — — —	WATER PIPELINE
-x—x—x—x—x-	FENCE
– · – – · – – · –	BURIED UTILITY
O RISER	TELEPHONE PEDESTAL
MH–1	MANHOLE W/ NUMBER
LT. POLE	LIGHT POLE
R.R.	RAILROAD
P. POLE	POWER POLE
C.L. FENCE	CHAIN LINK FENCE



VICINITY MAP

SCALE: 1" = 2000'

TABLE OF CONTENTS — SHEET NO.

EAST ALAMOSA WATER AND SANITATION DISTRICT
BOARD MEMBERS

Sally Salazar
Joel Anderson
Melvin Gallardo
Terry Milsom
Darrell Seefeldt

The following plans and accompanying specifications are hereby approved and adopted by action of the Board of Directors of the East Alamosa Water & Sanitation District Alamosa County, Colorado.

East Alamosa Water & Sanitation District

_____
President

ATTEST

_____
Secretary

AS BUILT

The following plans and accompanying specifications for the Lift Station Improvement Project in the East Alamosa Water & Sanitation District were prepared by me, or under my direct supervision, for the Owner thereof.

_____
John Allen Davey
Registered Engineer
Colorado Certificate No. 13349

DAVIS ENGINEERING SERVICE, INC.
576 SPRUCE STREET, P.O. BOX 130
DEL NORTE, COLORADO 81132
PHONE: (719) 657-3304
FAX: (719) 657-0711

EAST ALAMOSA LIFT STATION
IMPROVEMENT PROJECT

REV.	DATE	BY	APVD.

DESIGNED: CBC
DRAWN: CBC
CHECKED: JAD
APPROVED: PRELIM. COPY

SHEET NO.: 1 OF 5
SCALE: AS NOTED
CLIENT: EAST ALAMOSA WATER & SANITATION
DATE: 11/06/95
PROJECT NO.: D00864

PLAT OF

SANITARY SEWER COLLECTION SYSTEM

EAST ALAMOSA WATER AND SANITATION DISTRICT

ALAMOSA COUNTY, COLORADO

SCALE: 1" = 400'

COMPILED DECEMBER, 1976
REVISED NOVEMBER, 1995
BY

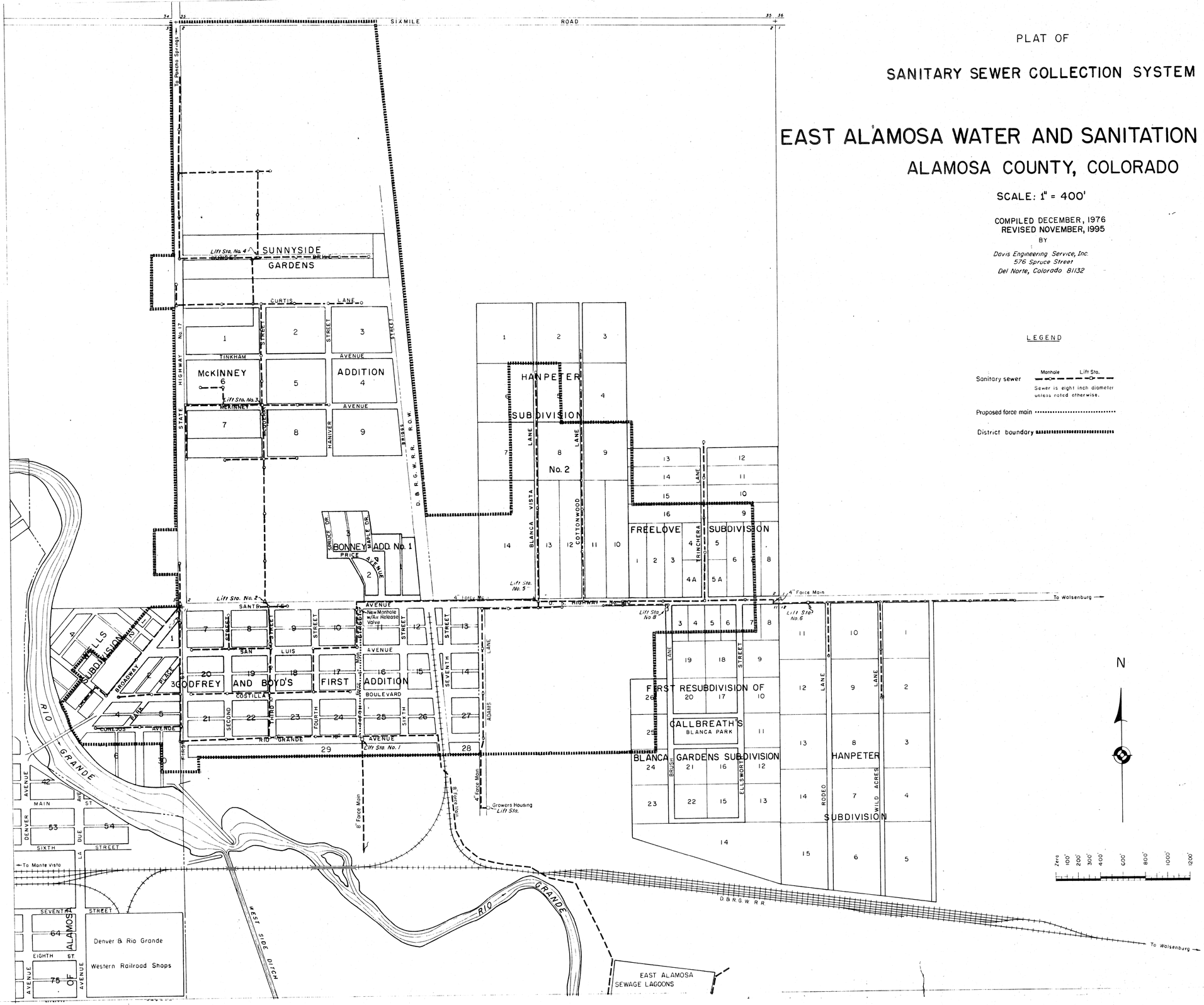
Davis Engineering Service, Inc.
576 Spruce Street
Del Norte, Colorado 81132

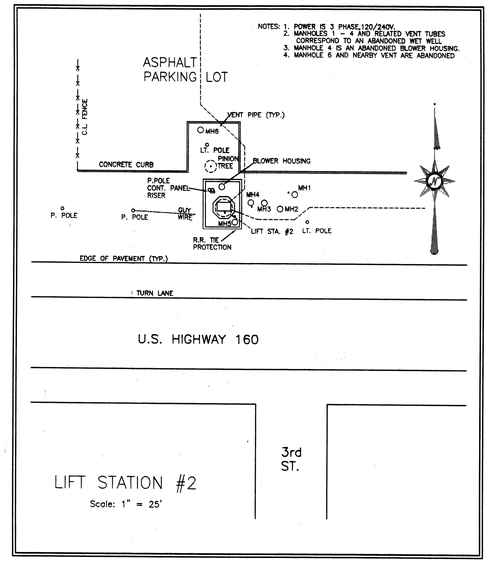
LEGEND

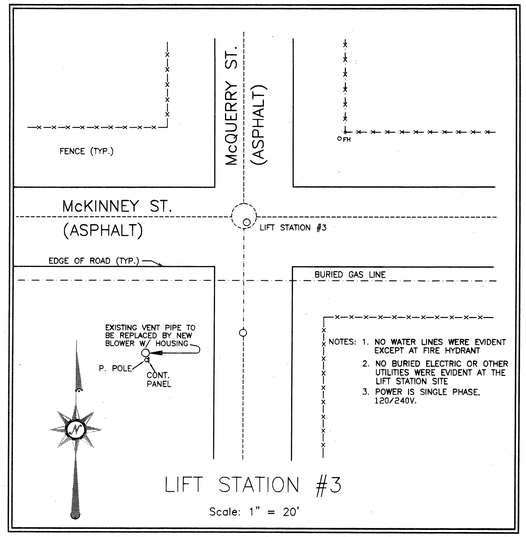
Sanitary sewer — Manhole — Lift Sta. — Sewer is eight inch diameter unless noted otherwise.

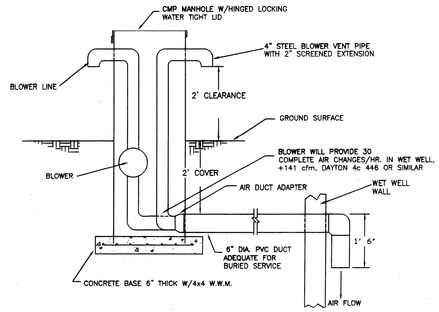
Proposed force main

District boundary

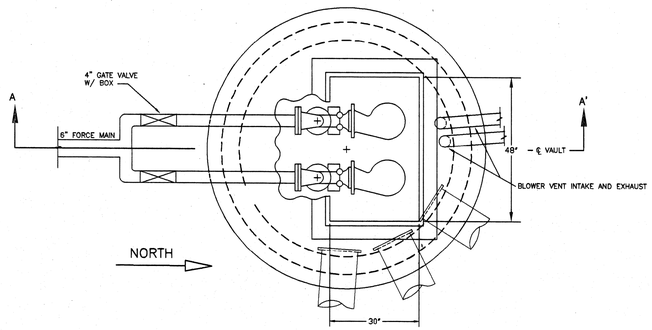




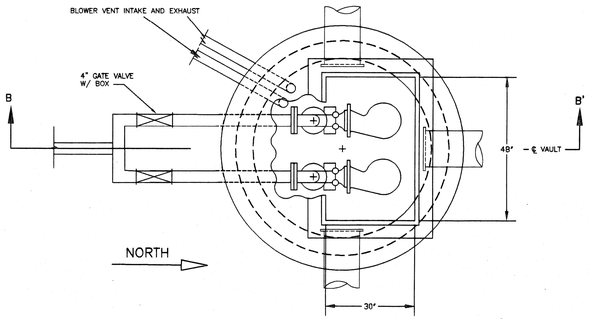




BLOWER CROSS SECTION



LIFT STATION NO. 2 – PLAN VIEW
SCALE: 1/2" = 1'



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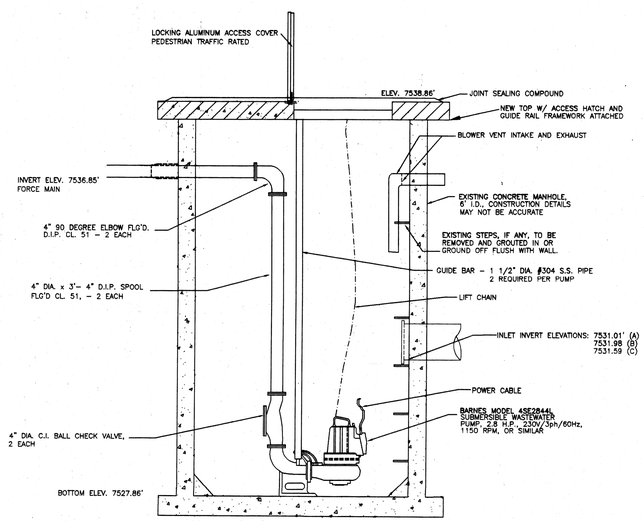

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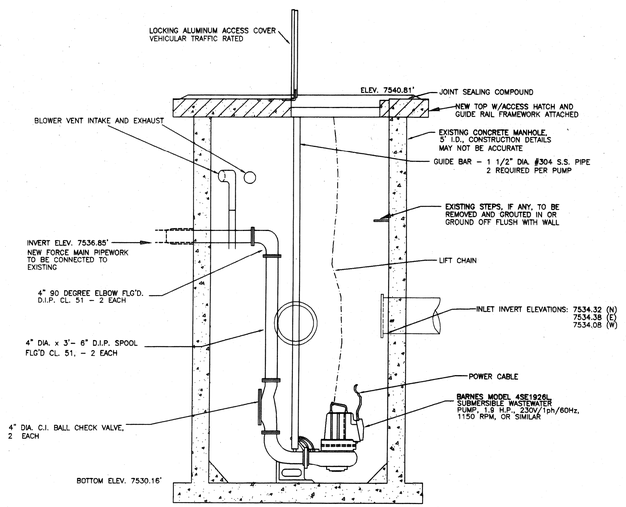
SCALE: 1/2" = 1'



LIFT STATION NO.3 – SECTION B – B'
SCALE: 1/2" = 1'

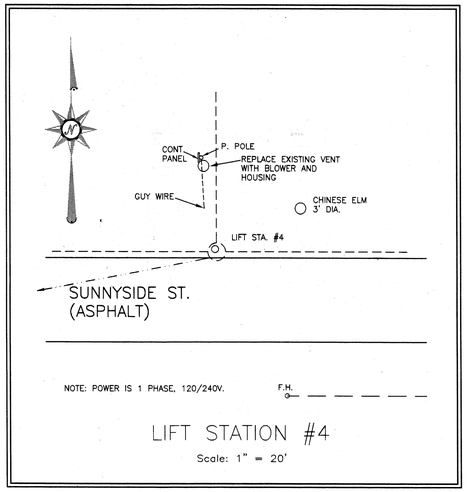
DAVIS ENGINEERING SERVICE, INC.
578 SPRUCE STREET, P.O. BOX 130
DEL NORTE, COLORADO 81132
PHONE: (719) 657-3004
FAX: (719) 657-0711

EAST ALAMOSA LIFT STATIONS
IMPROVEMENT PROJECT

REV.	DATE	BY	APVD.
2	2/06/96	CBC	JAD
1	12/22/95	CBC	JAD

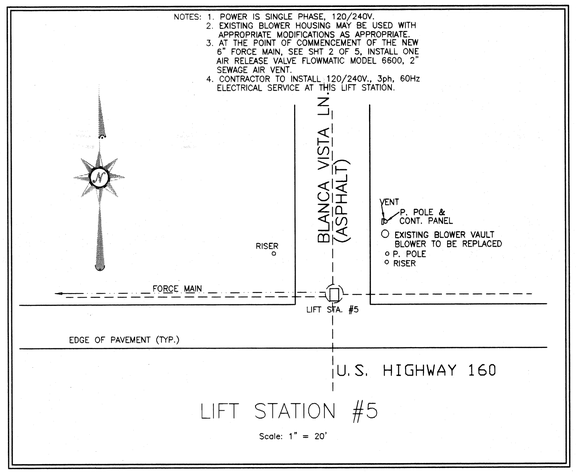
DESIGNED: CBC
DRAWN: CBC
CHECKED: JAD
APPROVED: JAD

SHEET NO. 3 OF 5
SCALE: AS SHOWN
DATE: 11/03/95
CLIENT: EAST ALAMOSA WATER & SANITATION
PROJECT NO. D00864



LIFT STATION #4

Scale: 1" = 20'



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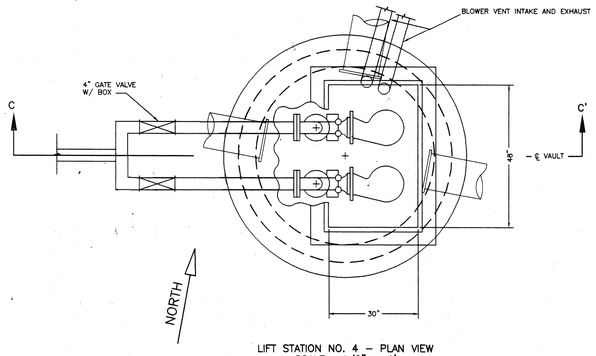
Scale: 1" = 20'



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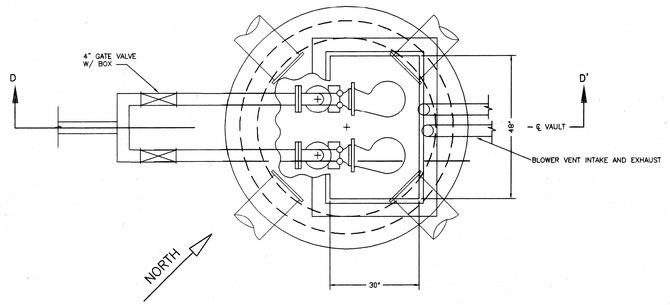
SCALE: 1/2" = 1'



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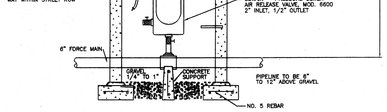
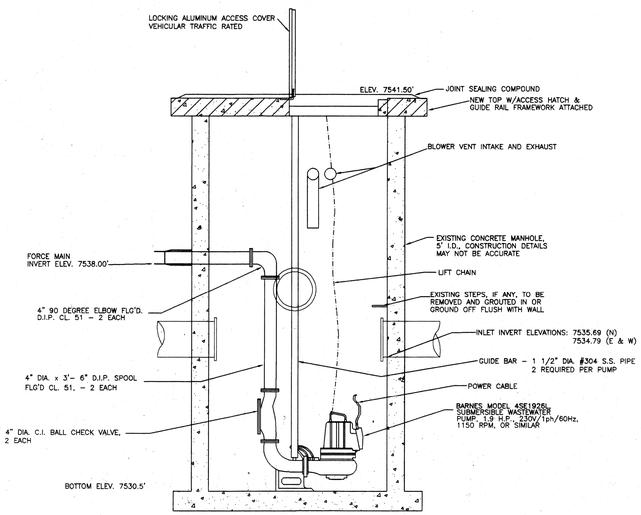
SCALE: 1/2" = 1'



PRESSURE SEWAGE AIR RELEASE VALVE

NO SCALE



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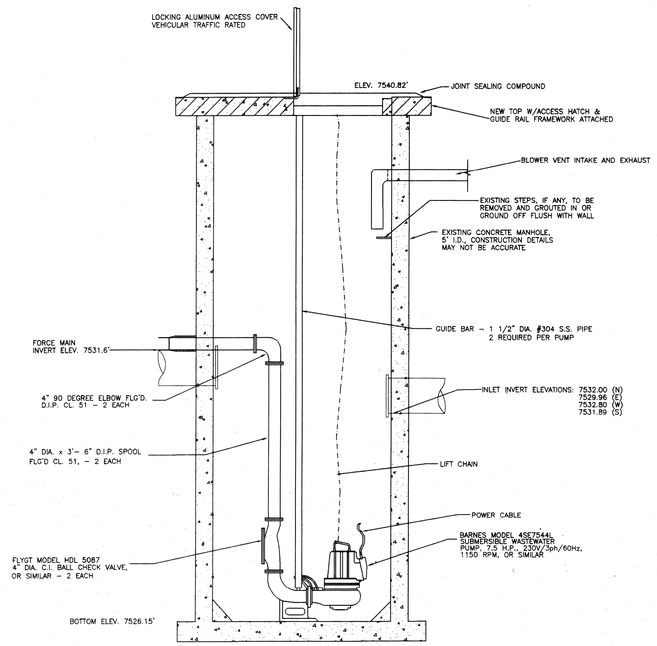
SCALE: 1/2" = 1'



LIFT STATION NO.5 – SECTION D – D'
SCALE: 1/2" = 1'

DAVIS ENGINEERING SERVICE, INC.
578 SPRUCE STREET, P.O. BOX 130
DEL NORTE, COLORADO 81132
PHONE: (719) 657-3304
FAX: (719) 657-0711

EAST ALAMOSA LIFT STATIONS

IMPROVEMENT PROJECT

REV.	DATE	BY	APVD.
1	2/06/96	CBC	JAD

DESIGNED: CBC
DRAWN: CBC
CHECKED: JAD
APPROVED: JAD

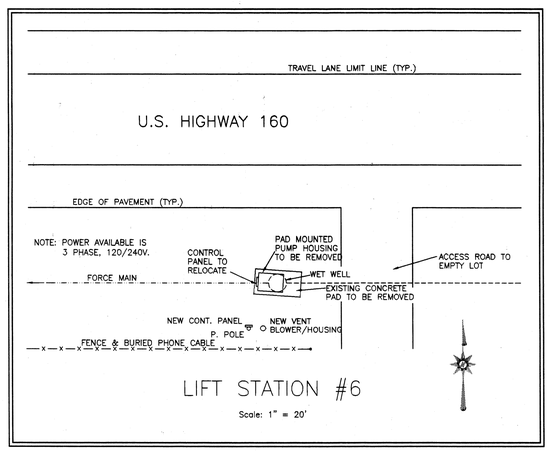
CLIENT: EAST ALAMOSA WATER & SANITATION

SHEET NO. 4 OF 5

SCALE: AS SHOWN

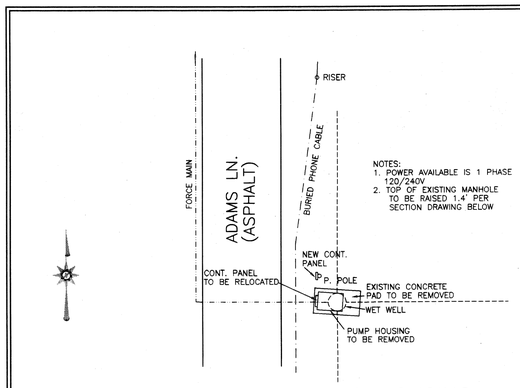
DATE: 11/03/95

PROJECT NO. D00864



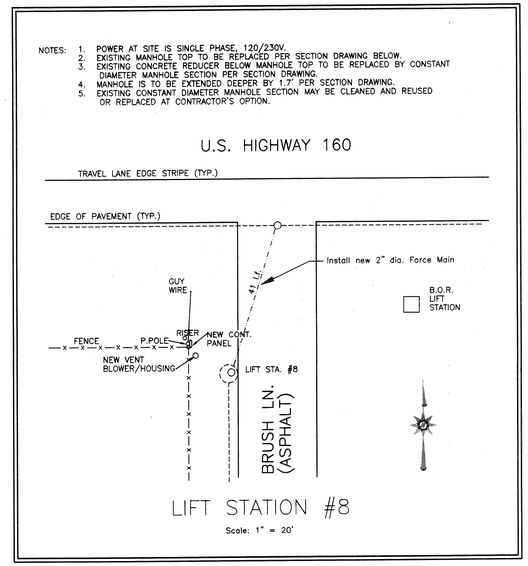
LIFT STATION #6

Scale: 1" = 20'



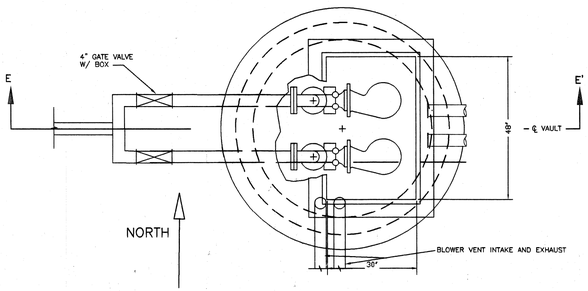
LIFT STATION GROWERS HOUSING

Scale: 1" = 20'

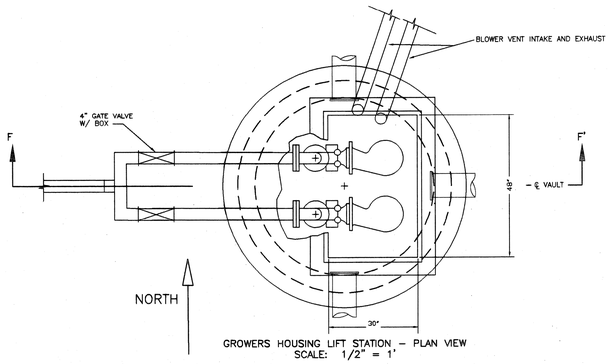


LIFT STATION #8

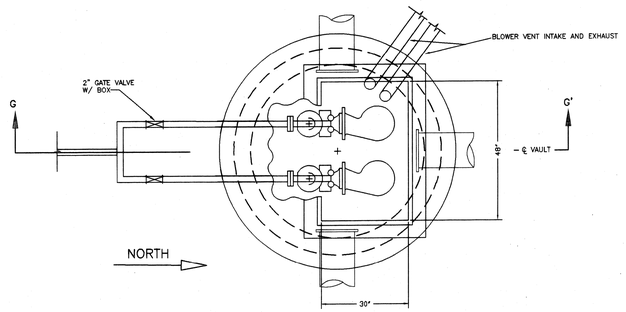
Scale: 1" = 20'



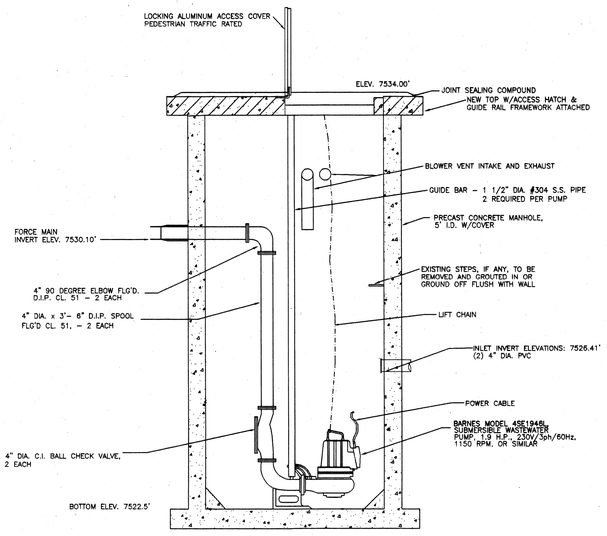
LIFT STATION NO. 6 – PLAN VIEW
SCALE: 1/2" = 1'



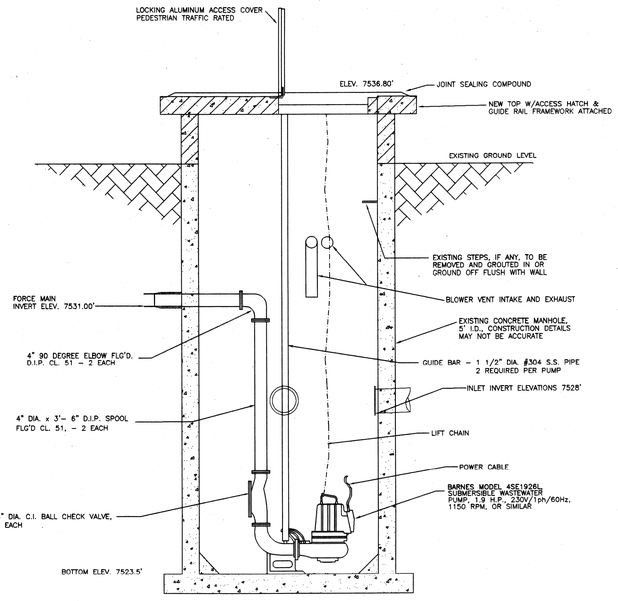
GROWERS HOUSING LIFT STATION – PLAN VIEW
SCALE: 1/2" = 1'



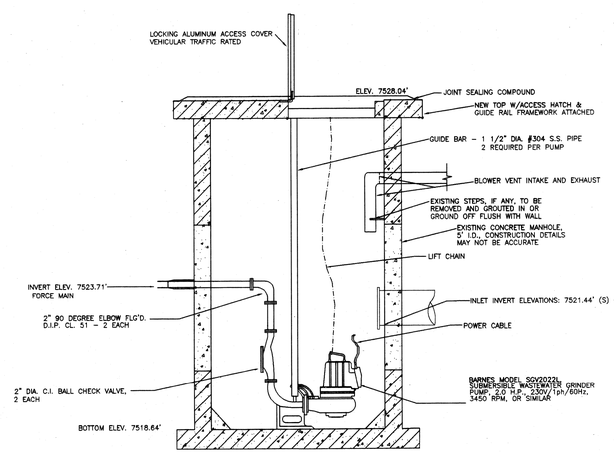
LIFT STATION NO. 8 – PLAN VIEW
SCALE: 1/2" = 1'



LIFT STATION NO.6 – SECTION E – E'
SCALE: 1/2" = 1'



GROWERS HOUSING LIFT STATION – SECTION F – F'
SCALE: 1/2" = 1'



LIFT STATION NO.8 – SECTION G – G'
SCALE: 1/2" = 1'

DAVIS ENGINEERING SERVICE, INC.
578 SPRUCE STREET, P.O. BOX 100
DEL NORTE, COLORADO 81132
PHONE: (719) 657-3304
FAX: (719) 657-0711

EAST ALAMOSA LIFT STATIONS
IMPROVEMENT PROJECT

REV.	DATE	BY	APV'D.
2	2/06/96	CBC	JAD
1	11/27/95	CBC	JAD

DESIGNED CBC
DRAWN CBC
CHECKED JAD
APPROVED JAD

SHEET NO. 5 OF 5
SCALE AS SHOWN
DATE 11/3/95
CLIENT EAST ALAMOSA WATER & SANITATION
PROJECT NO. D00864

421
McQUERRY ST.

McQUERRY ST

50'
R.O.W.

SAN

226 LF 8" VCP

187
McKINNEY AVE.

McKINNEY AVE

EXISTING LIFT STATION # 3 TO
BE FLOW FILLED AND CONVEY
FLOWS TO NEW LIFT STATION #3

50'
R.O.W.

306 LF 8" VCP

SAN

W

PROPOSED LIFT STATION #3
LOCATION

PROPOSED 6' Ø
OVERFLOW VAULT

REMOVE AND REPLACE
4" FORCE MAIN

81

395
McQUERRY ST.

390
McQUERRY ST.

50'
R.O.W.

REMOVE 378 LF 6" VCP
AND REPLACE WITH 378 LF
8" SDR35 PVC

N
W E
S

0 20' 40'

SCALE: 1" = 20'

CLIENT:
EAST ALAMOSA WATER AND SANITATION DISTRICT

EXHIBIT TITLE:
LIFT STATION #3 SITE PLAN

RG AND ASSOCIATES, LLC
4885 Ward Road, Suite 100 • Wheat Ridge, CO • 80033
303-293-8107 • 303-293-8106 (fax) • www.rgengineers.com

JOB NUMBER:
1017.0011

DATE:
November 4, 2022

SCALE:
1" = 20'

EAST US 160 SANTA FE AVE

11A

SAN

SAN

79 LF 8" PVC

SAN

100'
R.O.W.

N
W E
S

0 20' 40'

SCALE: 1" = 20'

186 LF 8" TRUSS PIPE

SAN SAN SAN SAN SAN

MH

SAN SAN

EXISTING 4" FORCE
MAIN TO REMAIN

EXISTING LIFT
STATION # 6

PROPOSED 6' Ø
OVERFLOW VAULT

11068
HWY. 160

7075
RODEO LN.

CLIENT:
EAST ALAMOSA WATER AND SANITATION DISTRICT

EXHIBIT TITLE:
LIFT STATION #6 SITE PLAN

RG AND ASSOCIATES, LLC
4885 Ward Road, Suite 100 • Wheat Ridge, CO • 80033
303-293-8107 • 303-293-8106 (fax) • www.rgengineers.com

JOB NUMBER: 1017.0011

DATE: 11/4/22

SCALE: 1" = 20'

APPENDIX F:
BUDGET INFORMATION

EAST ALAMOSA WATER AND SANITATION DISTRICT ENTERPRISE BUDGET 2022

	2021 Actual Enterprise Fund	2022 Budgeted Enterprise Fund	2023 Proposed Enterprise Fund	
Income				
4002 · Asphalt and Road Cutting Permit	0.00	500.00	500.00	
4100 · Water & Sewer Charges				
4100.1 · Water Charges	264,196.98	272,000.00	272,000.00	
4100.5 · Sewer Charges	262,681.93	262,000.00	262,000.00	
4110 · Grant Funding	614,153.37	375,000.00	525,000.00	350,000 CWRPA & 175,000 Alamosa County Grant
4150 · Land Lease	0.00	2,500.00	2,000.00	
4200 · Application for Service Fee	375.00	350.00	400.00	
Total Income	**1,141,407.28**	**912,350.00**	**1,061,900.00**	
Cost of Goods Sold				
5000 · Monthly Maintenance City	57,143.68	58,650.00	57,500.00	
5100 · Treated Water	47,636.30	56,500.00	57,000.00	
5200 · Regional Facility- Sewer Treatment	47,126.03	56,427.28	57,000.00	
5300 · Tap Fee Installation				
5300.1 · Water Tap Expense	0.00	2,500.00	2,500.00	
5300.2 · Sewer Tap Expense		2,500.00	2,500.00	
5400 ·Water Test	1,580.08	2,200.00	2,000.00	
Total Cost of Goods Sold	**153,486.09**	**178,777.28**	**178,500.00**	
Expenses				
6110 · Advertising/Legal Notices	577.50	300.00	1,000.00	
6145 · Capital Improvements	1,053,335.45	915,000.00	700,000.00	
6180 · Insurance	10,538.00	10,000.00	11,000.00	
6231 · Mileage Expense	25.35	100.00	400.00	
6240 · Farm Land Assessments	0.00	650.00	650.00	
6270· Professional Fees	10,615.00	8,200.00	8,200.00	
6300 ·Repairs & Maintenance	25,182.83	30,000.00	35,000.00	
6310 · Road Cutting Permit Fee	0.00	500.00	500.00	
6320 · Water Augmentation	0.00	1,000.00		
6390 · Utilities	25,692.64	35,000.00	37,250.00	
6460 · Contract Labor				
6560 · Pay Roll Expenses				
6560.1 · Wages	61,091.37	60,000.00	65,000.00	
6565.2 · Fringe & Taxes	8,500.40	10,000.00	10,000.00	
6770 · Supplies	9,167.52	9,500.00	9,500.00	
6775 · Office Equipment	1,779.59	2,500.00	2,500.00	
6780 · Miscellaneous	-			
Total Expense	**1,206,505.65**	**1,261,527.28**	**1,059,500.00**	
Net Ordinary Income	-65,098.37	-349,177.28	2,400.00	
NET ASSET CHANGES*				
Items affecting the Balance Sheet				
CRWPA Loan +	232,490.87	200,000.00	150,000.00	
Reserve Funds +	223,224.21	280,000.00		
Principal Payments -	66,667.00	124,590.00	125,000.00	
NET Including Balance Sheet Items	323,949.71	6,232.72	27,400.00	

*Due to the expense of the capital investments, 2021 and 2022 budget shows negative balance. The loan from Colorado Water and Power Authority combined with District cash reserve fund offsets the budget deficit.

Other Income and Expenses			
Other Income			
Interest Income	$ 4,011.31	$ 4,000.00	$ 4,000.00
Capital Improvements			
Depreciation Expense	$ 203,810.00	$ 203,810.00	$ 205,000.00
Other Financing Sources (uses)			
Transfers	$ 18,000.00		
Net Income		$ (677,577.28)	$ (230,000.00)
Net Change in Fund Balance		$ (577,554.28)	$ 677,577.28
Fund Balance Beginning of Year	4,479,534.00	4,579,557.00	3,901,979.72
Fund Balance End of Year	4,579,557.00	3,901,979.72	3,671,979.72

APPENDIX G:
CAPITAL IMPROVEMENT PLAN

WATER AND WASTEWATER
PRELIMINARY CAPITAL IMPROVEMENT PLAN

FOR

EAST ALAMOSA WATER AND SANITATION DISTRICT
ALAMOSA, COLORADO

OCTOBER 2012
UPDATED: NOVEMBER 2013
UPDATED: SEPTEMBER 2019

RGA JOB NO.: 1017.0004

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DEFINITIONS, ACRONYMS, AND ABBREVIATIONS (ALL MAY NOT BE USED)

BOD_5	5-Day Biochemical Oxygen Demand
CDPHE	Colorado Department of Public Health and Environment
CDPS	Colorado Discharge Permit System
cm/sec	Centimeters per second
CY	Cubic Yards
DOLA	Department of Local Affairs
EA	Each
EDU	Equivalent Dwelling Unit
EPA	Environmental Protection Agency
ft	feet
gal	gallons
gpcd	gallons per capita-day
gpd	gallons per day
gpm	gallons per minute
hp	horsepower
HVAC	Heating, Ventilating and Air Conditioning
I&I	Inflow and Infiltration
kW	kilowatts
lb/ac-day	Pounds per acre-day
lb/day	Pounds per day
LF	Linear Feet
LS	Lump Sum
mg/L	milligrams per Liter
MGD	Million Gallons per Day
N/A	Not available or applicable
O&M	Operations and Maintenance
OMB	Office of Management and Budget
PEL	Preliminary Effluent Limitations
PVC	Polyvinyl Chloride
PW	Present Worth
ref.	Reference
RGA	RG & Associates, LLC
RUS	Rural Utilities Services
SCADA	Supervisory Control and Data Acquisition
SF	Square Feet
SOG	Slab on Grade
TSS	Total Suspended Solids
USDA	United States Department of Agriculture
VFD	Variable Frequency Drives
WWTP	Wastewater Treatment Plant
YR	Year

1 INTRODUCTION

1.1 PRELIMINARY CAPITAL IMPROVEMENT PLAN (CIP) PURPOSE

RG and Associates, LLC (RGA) was tasked with completing a Preliminary Capital Improvement Plan (CIP) for the East Alamosa Water and Sanitation District. The purpose of this Preliminary CIP is to identify, prioritize, and address the District's water distribution and wastewater collection improvement needs to assist the District Board in identifying proposed maintenance and replacement projects over the next ten years.

After review of the initial recommendations provided in 2013, a revised capital improvement plan was completed in 2019, which included updating the preliminary cost estimates as well as the recommended construction method proposed.

The scope of this CIP is a preliminary overview of the East Alamosa Water and Sanitation District water distribution and wastewater collection systems. A full visual survey of the system has not been completed by RGA at this time; therefore, the maintenance and replacement recommendations presented herein are limited to those reported by District representatives and operators. After review of the videoing of the sanitary mainlines, a more detailed recommended construction approach can be generated, which will allow for a more precise cost estimate for each project.

1.2 PROJECT LOCATION AND SERVICE AREA

The East Alamosa Water and Sanitation District is located in Alamosa County directly to the north-east of the City of Alamosa. The district is roughly bound by State Highway 17, the Alamosa River and Wild Acres Lane. A map delineating the district boundary is shown in Figure 1.

The District operates under the Public Water System Identification (PWSID) number CO0102200 and according to the EPA Drinking Water Information System serves approximately 1698 customers. The District consists solely of water distribution and wastewater collection infrastructure. Water is purchased from the City of Alamosa and Wastewater is pumped to the Alamosa regional treatment facility which is operated by the City of Alamosa.

The City of Alamosa and the District have an intergovernmental agreement in which the District pays the City's staff to perform operation and maintenance duties. Typically the City operators respond to issues within the District as they become aware that they exist. The Alamosa operators are not responsible for a system-wide preventative maintenance program.

1.3 FUTURE GROWTH TRENDS

At this time there are no plans for large development within the District. This Preliminary CIP will focus entirely on recommending areas of rehabilitation or replacement within the existing water distribution and sanitary sewer collection system. If in the future large growth trends are foreseen, an update to the District's CIP program will be required.

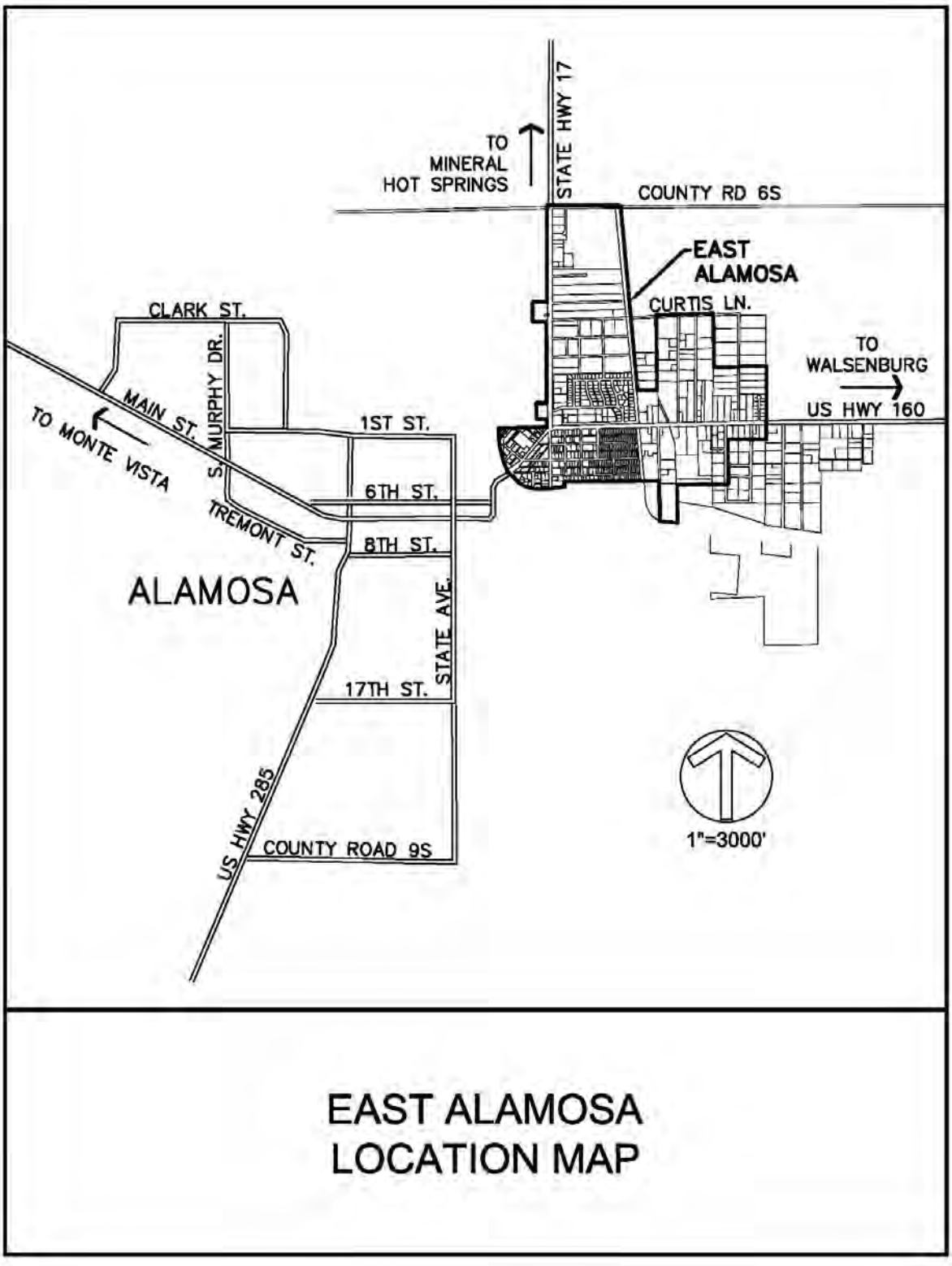


Figure 1: East Alamosa Sanitation District General Location

2 SERVICE AREA FEATURES & PROJECT PRIORITIES

This Section details a brief examination of the overall condition of the District's distribution and collection system and prioritizes rehabilitation and/or replacement projects. The prioritized projects are based upon operations and maintenance time spent on each portion of the system. Operator suggestions were also weighed when determining project priorities. Engineering, permitting and construction cost estimates were also developed for each project.

It is important to note that the CIP outlook is 10-years and depending on funding availability from year-to-year, the projects may be completed in whole, or phased over multiple years. Many Districts and municipalities choose to phase sanitary sewer rehabilitation and complete a portion of the desired project each year.

2.1 DISTRIBUTION SYSTEM EVALUATION / MAINTENANCE

In general, the water distribution system is operating without any major problems. The concerns addressed herein will highlight older distribution mains and inadequate line sizes that may cause problems in the future as well as the lack of isolation valves and fire hydrants.

The District's distribution system consists of water lines sized between 2-inch and 12-inch diameter pipe of varying material. Asbestos cement (AC) pipe was typically installed in the mid 1900's and was historically used before PVC was popularized as a pressure pipe material. Over time AC pipe will degrade and become brittle, making point repairs and new line tie-ins difficult. The lifespan for AC pipe is typically assumed to be 50 to 60 years. Therefore, AC pipe within the District should be targeted for replacement first, as it has reached its useful lifespan. Leak and break repair on AC pipe will generally become more costly with older pipe as it tends to crack and break easily during repair.

In addition to concerns about the pipe material, the pipe size in some areas is too small to carry adequate fire fighting flow (typically 1,500 gpm).

The distribution system also lacks adequate isolation control in several areas. Typically, where waterlines connect in tees or crosses the n-1 rule is followed, where n is equal to the number of legs in the connection. In a four-leg tie-in for example, the minimum number of valves required for isolation would be three. This rule of thumb gives the operator the required isolation control to limit small sections of the distribution system being shut down for repair and/or replacement. In addition to the n-1 rule, isolation valves are also placed about every 1,200 feet along a straight run of pipe. There are several locations in the older portions of the District in which there are no isolation valves. Presently, during repairs or maintenance of the line large areas of customers must be shut down for extended periods of time.

In addition to lack of control and isolation valves, the older areas of the District do not appear to contain the proper number of fire hydrants. The spacing of fire hydrants is dictated by the City of Alamosa Fire Chief. The spacing requirement usually dictates that hydrants be installed at a spacing of no more than 500 feet.

Estimated distribution system infrastructure quantities are shown in Table 2-1.

Table 2-1: Distribution System Infrastructure Summary

EAST ALAMOSA WATER & SANITATION DISTRICT Water Infrastructure Summary October, 2012	
Facility Type	**Estimated Existing Quantity[1]**
2" Diameter Water Line (L.F.)	2,870
3" Diameter Water Line (L.F.)	2,400
4" Diameter Water Line (L.F.)	2,500
6" Diameter Water Line (L.F.)	49,650
12" Diameter Water Line (L.F.)	12,300
Fire Hydrant (Each)	27
Booster Pump Station (Each)	2
[1]Quantities estimated from mapping provided to RGA by District.	

There are several general areas of concern within the distribution system that have been noted by the operations staff. These areas are summarized in Table 2-2.

Table 2-2: Distribution System Known Issues

EAST ALAMOSA WATER & SANITATION DISTRICT Water System Known Issues October, 2012		RGA Job No.: 1017.0001
Problem Location[1]	**Maintenance Issue**	**Pipe Diameter**
Oldest Area of District - South of East US 160 and West of Adams Lane	Pipe Size, ACP Material, Hydrants, Valves	6, 2-inch
North of Bonney Drive	Pipe Size, ACP Material, Hydrants, Valves	6 to 2-inch
Along White Pine Drive and along Adams Lane	Pipe Size, ACP Material, Hydrants, Valves	6-inch
Along East US 160 and along Wild Acres Lane	Pipe Size, ACP Material, Hydrants, Valves	6 to 2-inch
[1]Problem areas identified by system operators and are not to be considerered inclusive of all issues within the system.		

2.2 COLLECTION SYSTEM EVALUATION / MAINTENANCE

The District's gravity collection system consists of 8-inch and 10-inch diameter pipe. The pipe is constructed of varying material including PVC and vitrified clay pipe (VCP) of which there are a number of areas of concern.

Several of the areas of concern within the District are gravity sewer pipes with severe root issues. Over time tree roots have grown into contact with the pipe and are cracking and puncturing through the pipe system generally at the pipe joints. Trash and debris will then hang up on these roots and backup the collection system. If these backups become severe, customers may see sewage backup in basements, which may lead to a liability concern for the District. The District's operators have several stretches of sanitary sewer line which must be routinely jetted and root cut to remove tree roots and other debris to combat sewage backups.

An additional concern with root contact with VCP is increased inflow and infiltration (I/I) which is defined as groundwater and/or stormwater runoff entering a sanitary sewer system. As described, VCP can become brittle will crack when nearby tree roots grow into contact with the pipe. Under the worst-case scenario clay pipe can partially or completely collapse. Damaged pipe will allow significant inflow and infiltration during high groundwater seasons. In the older areas of the District the pipe has outlived its useful lifespan and may be deteriorating and allowing significant inflow and infiltration.

This unwanted water from inflow and infiltration takes additional capacity in the pipe that would otherwise be reserved for sanitary sewer flow. The net result is an overall decrease in system capacity and an increase in flow through the system and which must be pumped and eventually metered before delivery to the Alamosa Regional Treatment Facility.

In addition to gravity sanitary sewer, the District also features nine (9) sanitary sewer lift stations of varying sizes. These lift stations were generally installed in the early to mid 1990's. The typical hardware (pumps, rails, controls, etc.) design life for a lift station is typically 20-years; however, under a rigorous preventative maintenance regime the useful life can be extended another 5 to 10 years. The hardware within several of the District's lift stations is reaching the end of its useful life. Operators have reported increased maintenance calls and time spent repairing pumps due to deteriorated rails, control wires that were not properly sized and pumps that routinely clog. Two of these lift stations, LS No. 1 and LS No. 2, were replaced in 2016.

The issues discussed above represent a brief overview of the system as described by the system operator. Further inspection of the entirety of the collection system may reveal additional issues and provide better clarity on the proposed construction method to be implemented. The estimated overall collection system infrastructure quantities are shown in Table 2-3.

Table 2-3: Collection System Infrastructure Summary

EAST ALAMOSA WATER & SANITATION DISTRICT
Wastewater Infrastructure Summary
October, 2012 **RGA Job No.: 1017.0001**

Facility Type	Estimated Existing Quantity[1]
8" Diameter Gravity Sanitary Sewer (Feet)	45,100
10" Diameter Gravity Sanitary Sewer (Feet)	3,300
Access Manhole, Varying Sizes (Each)	148
Lift Station, Varying Capacity (Each)	8
4" Diameter Force Main (L.F.)	2,887

[1]Quantities estimated from mapping provided to RGA by District.

There are several stretches of line which have severe damage due to tree and root growth. Other areas suffer for poor installation and/or design. Several problem areas within the collection system have been identified by the system operators. These known issues are outlined in Table 2-4.

Table 2-4: Collection System Known Issues

EAST ALAMOSA WATER & SANITATION DISTRICT
Wastewater Collection System Known Issues
October, 2012 **RGA Job No.: 1017.0001**

Problem Location[1]	Maintenance Issue	Pipe Diameter
All Pipe in Highway 160 between Adams and Trinchera Lane (8" Dia SS and 4" Dia FM)	Roots	8-inch
Sanitary Sewer in Blanca Vista Lane	Roots	8-inch
Sanitary Sewer in Cottonwood Lane	Roots	8-inch
Sanitary Sewer in Trinchera Lane	Roots	8-inch
Sante Fe Discharging from Lift Station No. 5	Roots	4-inch
Sante Fe Directly Across the Street from Lift Station No. 5	Roots	8-inch
Costilla Between First and Third Streets	Roots	8-inch
Pipe Discharging into Lift Station No. 5	Pipe has Reverse Grade	8-inch
Pipe in the Oldest Area of the District is Deteriorating and Needs Rehab	General Age	8, 10-inch

[1]Problem areas identified by system operators and are not to be considerered inclusive of all issues within the system.

These are known collection system issues which have historically required increased maintenance. A full inspection of the collection system may reveal additional locations that may not be presenting current maintenance issues but will require rehabilitation or replacement in the near future.

In addition to the gravity collection system RGA has briefly inspected the District's lift stations. During this inspection a system operator detailed the maintenance frequency and equipment issues which have been encountered. The results of these inspections were detailed to the District in June of 2012 and are summarized below:

Lift Station #1- Primary Lift Station for connection to the Alamosa Wastewater Treatment Plant
Inspection Notes: This Lift Station was replaced in 2016.

Lift Station #2- Ramada South
Inspection Notes: This Lift Station was replaced and relocated in 2016.

Lift Station #3- McKinney and McQuery
Inspection Notes:

- Bad pump rails
- Maintenance – every 2 – 3 weeks

Lift Station #4- Sunnyside Lane
Inspection Notes:

- Bad pump rails – too short
- Pump wires are in the way – needs rewired with re-routed and longer wires

Lift Station #5- Blanca Vista
Inspection Notes:

- Low maintenance/ pumps pulled on an infrequent basis
- Access issue- located in middle of a drive / side road and surface ice is sometimes a problem
- Tree roots in sewer line are a problem

Lift Station #6- Rodeo
Inspection Notes:

- Pump wires are in the way – needs rewired with re-routed and longer wires
- Maintenance – every two weeks
- Sewer pipe has a reverse grade – sometimes creating flow problems
- Tree roots in sewer line are a problem

Lift Station #7- Adams
Inspection Notes:

- Low maintenance / pumps pulled on an infrequent basis
- Low usage

Lift Station #8- Brush Lane
Inspection Notes:

- Low maintenance
- Bad pump rails
- Tree roots in sewer line are a problem

Lift Station #9- North of Ramada Inn
Inspection Notes:

- Low maintenance / pumps pulled on an infrequent basis
- Different size pumps
- Pump wires are in the way and cross – needs rewired and re-routed and longer wires
- Bad pump rails

The engineering data for each pump as documented in the 1995 Lift Station Improvement Project 'As-Built' stamped drawings is shown in Table 2-5.

Table 2-5: Existing Lift Station Pump Information

EAST ALAMOSA WATER & SANITATION DISTRICT
Existing Lift Station Summary

September, 2019 — **RGA Job No.: 1017.0001**

Lift Station No.	L.S. Notes	Pump Make & Model	Pump Motor Information	Design Point	Year Installed
1	District Effluent Lift Station	Flygt W-Pump Model - 3153.185	15 HP, 240V/3ph	673 @ 73 ft TDH	2016
2	Ramada South Lift Station	Wemco Chop Flow 6x4 CFS 2	4.5 HP, 230V/3ph/60HZ	275 gpm @ 15.5 ft TDH	2016
3	McKinney St. and McQuery St.	Barnes, 4SE1926L	1.9 HP, 230V/1ph/60HZ	150 gpm @ 7 ft TDH	1995
4	Sunnyside St.	Barnes, 4SE1926L	1.9 HP, 230V/1ph/60HZ	125 gpm @ 8 ft TDH	1995
5	Blanca Vista Ln. and Hwy160	Barnes, 4SE7544L	7.5 HP, 230V/3ph/60Hz	200 gpm @ 55 ft TDH	1995
6	Rodeo Ln and Hwy 160	Barnes, 4SE1946L	1.9HP, 230V/3ph/60Hz	125 gpm @ 22 ft TDH	1995
7	Adams Lane	Unkonwn	Unknown	125 gpm @ 9 ft TDH	1991
8	Brush Lane	Barnes, SGV2022L	2.0 HP, 230V/1ph/60Hz	30 gpm @ 9 ft TDH	1990
9	North of Ramada Inn	Unknown	Unknown	Unknown	Unknown

Note: Lift station information taken from previous design documentation (1995 L.S. Replacement Project)

2.3 DISTRIBUTION SYSTEM RECOMMENDED IMPROVEMENTS / MAINTENANCE

As previously stated, the distribution system requires relatively low maintenance efforts when

compared to the sanitary sewer collection system. The projects prioritized were selected for preventative replacement of the inadequately sized mains and AC pipe prior to it becoming a maintenance issue. It is not known if all AC water lines are identified on the District map. Many stretches of lines shown do not specify a material type. Also, sections of the distribution system with lines below 4-inches in diameter are recommended for replacement with 6-inch mains for fire flow capacity reasons.

Also, of concern in the Distribution system is the general lack of isolation/control valves and fire hydrants. All recommended projects should include adequately spaced fire hydrants and isolation valves incorporated during the design phase of the project. The local fire authority should review and approve water system improvements design plans to ensure fire fighting needs are adequately addressed.

Preventative maintenance should also be addressed as the distribution system is improved. Routine fire hydrant flushing, and valve exercising should be undertaken. Valves should in general be exercised one to two times per year. A record of inoperable or buried valves should be maintained for future replacement. Fire hydrant flushing will remove sediment built up in dead end areas of the line and ensure that hydrants are operating as intended. Records should be kept of flushing activities along with any problems encountered. The overall preventative maintenance regime will help identify issues within the distribution system prior to them becoming active maintenance concerns.

The following costs quoted are shown as excavation removal/replacements, however other rehabilitation methods including pipe bursting of the water mainlines was reviewed for applicability. After review, RG and Associates feels that utilizing pipe bursting for the different phases was not feasible on a majority of the removals. Pipe bursting may make sense as a construction method in some specific cases, but in a majority of the replacements, the following issues would be encountered.

- Existing water service would need to be provided by temporary "bypass" waterlines of all affected residents/businesses.
- Although upsizing of pipes is available in pipe bursting, upsizing of multiple sizes is not available unless advantageous soil conditions without groundwater exist. (e.g. a 2" size to a 6" size) – (2" to 3"), (3" to 4"), (4" to 6") typically can be pipe burst.
- The percussive action from dynamic bursting heads can cause significant ground movement, which can damage nearby underground utilities and structures.
- Although there would be an insertion pit/exit pit during bursting, any appurtenances (water services, tees, bends, etc.) would require an additional excavation for reconnection to the new pipe removing the cost savings initially realized by not performing open cut methods.
- Additional "hidden" costs of pipe bursting – videoing of lines, geotechnical report for each pipe bursting location, multiple asphalt patches along roads, etc.
- Pipe bursting is not applicable on any AC pipe, as EPA and CDPHE do not allow it, due to the bursting making the soil around the pipe an active hazardous waste site.

As it appears from the District maps that a majority of the waterline repairs within each phase have multiple service connections, pipe bursting would actually be more expensive than a removal/replacement and in general would not be recommended as the construction method to be used. However, review of each mainline located within a specific phase would determine if pipe bursting would be applicable. If it appears that pipe bursting in an applicable area could be competitive with conventional open trench technology in a particular area, the construction/bid documents for a project to include that area could easily include bursting as an alternate bid.

A detailed cost estimate for each project is located in the Appendix of this report.

- **Water Distribution System Project No. 1 – Improvements Phase I**

  This project focuses on replacing the oldest waterlines in the District which are known to consist mostly of AC pipe. The general area of replacement is all the pipe south of East US 160 (Santa Fe Ave.) and west of Adams Lane.

- **Water Distribution System Project No. 2 – Improvements Phase II**

  This project replaces several inadequately sized lines as well as AC pipe. The general area of this project is the pipe north of Bonney Drive.

- **Water Distribution System Project No. 3 – Improvements Phase III**

  This project replaces AC pipe along Adams Lane and White Pine Drive.

- **Water Distribution System Project No. 4 – Improvements Phase IV**

  This project replaces inadequately sized and AC pipe along Wild Acres Lane and East US 160 (Santa Fe Ave.).

The recommended project priorities and their respective costs for the water distribution system are shown in Table 2-6. These projects are shown in an Exhibit I. **Although a pipe bursting cost is shown below, the current stance of the EPA/CDPHE states that pipe bursting of AC pipe is not allowed due to making the soil around the burst pipe an active waste site.**

Table 2-6: Water Distribution System Improvement Summary

EAST ALAMOSA WATER & SANITATION DISTRICT Overall Water Distribution System Improvements Summary September, 2019		RGA Job No.: 1017.0001
Priority	**Project Description**	**Project Cost**
1A	Water Distribution System Improvements Phase I - Open Cut	$ 3,061,239
1B	Water Distribution System Improvements Phase I - Pipe Burst	$ 2,927,926
2A	Water Distribution System Improvements Phase II - Open Cut	$ 1,172,182
2B	Water Distribution System Improvements Phase II - Pipe Burst	$ 1,010,419
3A	Water Distribution System Improvements Phase III - Open Cut	$ 1,034,959
3B	Water Distribution System Improvements Phase III - Pipe Burst	$ 996,123
4A	Water Distribution System Improvements Phase IV - Open Cut	$ 1,350,853
4B	Water Distribution System Improvements Phase IV - Open Cut	$ 1,161,695
***ESTIMATED WATER DISTRIBUTION IMPROVEMENT COST -**		**$ 6,619,234**

* Open Cut cost indicated as current stance by EPA/CDPHE does not allow pipe bursting of AC pipe
**It is important to note that costs for the pipe bursting alternatives shown above are for the same length of pipe that was used for the equivalent open cut alternative, and is for comparative purposes only, since we have already shown that not all of the pipe in any of the Phases would qualify for bursting technology, due to EPA/CDPHE acceptance or multiple larger pipe sizes.

2.4 COLLECTION SYSTEM RECOMMENDED IMPROVEMENTS

The collection system improvements are focused on rehabilitation and replacement of some of the most man-hour intensive areas within the District. Repair and maintenance in areas of the collection system requires the vast majority of the time spent by the District's operations staff. The project priorities were developed based on the intensity of operation and maintenance required and operator wishes.

As with the distribution system, a preventative maintenance schedule should be developed. This includes routine jetting of lines and routine visual inspections of each lift station. Detailed records

should be kept on all maintenance activities which will ensure issues within the collection system are identified before they become a larger problem.

An overall inspection of the collection system is also recommended. By opening and inspecting each manhole in the District, the line sizes and locations shown in the District map can be confirmed or updated if required. A phased approach to a complete camera of the system over several years should also be instituted. This will alert the District to deteriorating pipes prior to backups occurring as well as allow for the proper construction method of replacement to be determined.

For two of the major sanitary sewer collection system priorities three alternative methods have been provided for construction. Alternative A is pipe bursting, Alternative B is the traditional open cut method and Alternative C is cured in place (CIP) pipe.

Alternative A: Pipe bursting is a rehabilitation technique in which a large cone shaped expansion head is pulled through the existing pipe. This action destroys the existing pipe and widens the cavity in the soil where the pipe had been. A new pipe is then pulled through to match the existing inverts of the replaced pipe. This technique requires a camera inspection, root cutting and jetting of the existing line prior to installation. Typically, a trench is required every 400 to 500 feet to accommodate the pipe which is being pulled into place. Multiple excavations are also required to re-connect each service line. This method utilizes a new PVC pipe with a lifespan of 100 years or more.

As discussed previously within this report, pipe bursting would only be the recommended construction method if the conditions of the mainline would warrant this method. Pipe bursting would be recommended on transmission mainlines that have no structural issues and little to no connections as each connection would require its own excavation for reconnection. Also, pipe bursting would not be allowed on any AC pipe.

Alternative B: Open cut is the traditional method of excavating to the proper depth and placing pipe as needed. During open cut construction the existing sanitary sewer line is left active. Once sanitary sewer services are connected to the new pipe, the old pipe and manholes are typically abandoned in place. This method is generally more expensive because the contractor must replace asphalt and/or landscaping that was removed prior to trench excavation. This method utilizes a new PVC pipe with a lifespan of 100 years or more.

Alternative C: In the cured in place pipe (CIPP) rehabilitation method a long sock is blown into a stretch of sanitary sewer lines between manholes, this sock is impregnated with resins which form to the outside wall of the existing pipe. The resin is then steam cured to harden the resin. The result is a pipe that has a slightly smaller inside diameter than the original pipe. After the resin has cured the contractor cuts taps with a remote-controlled tap-cutting device that operates on a sled inside the pipe. This technique requires a camera inspection, root cutting and jetting of the existing line prior to installation. This rehabilitation method does not utilize a manufactured pipe and therefore the lifespan may be slightly shorter than a factory cured pipe.

If structural issues (broken pipe, sags, etc.) are not seen within the mainline sections, CIPP rehabilitation would be the most cost-effective approach to repairing the mainlines.

A detailed cost estimate for each project is located in the Appendix of this report.

- **Sanitary Sewer Project No. 1 – Lift Station No. 2 Replacement**

  This project was completed in 2016. No additional work is planned for this project.

- **Sanitary Sewer Project No. 2 – Lift Station No. 1 Replacement**

  This project was completed in 2016. No additional work is planned for this project.

- **Sanitary Sewer Project No. 3 – Sanitary Sewer Rehabilitation Project Phase I**

  This project consists of rehabilitating the gravity sanitary sewer pipe located in East US 160 (Santa Fe Ave.), Blanca Vista Lane, Cottonwood Lane, and Trinchera Lane. These sections of pipe have severe problems with root growth and require routine jetting to prevent clogging and sewage backup. This includes the trenchless rehabilitation of 8,600 l.f. of 8-inch diameter clay pipe. The preliminary recommendation for trenchless rehabilitation is pipe lining if the pipe is structurally sound with no broken/sag areas located within the mainline, which will eliminate the roots and allow the installation of a new 8-inch pipe without opening a trench the length of the pipe. The 25 manholes along this stretch will be lined if they are structurally sound. If not, they could be completely replaced with new manholes.

  The original recommendation of pipe bursting of this line is not recommended as multiple excavations in addition to the entry and exit pits would be required to reconnect each sanitary sewer service to the new mainline. Pipe bursting would only be recommended if there were no or very few sanitary sewer services located on a section of mainline.

  Preliminary cost estimates were generated for both trenchless rehabilitation and open cut for this project. This project may be broken into several sub-phases depending on the availability of funding.

  Also included within the project estimated cost for CIPP lining estimate are twenty (20) – 10 LF point repairs, which will be required to be completed prior to lining of the pipe.

- **Sanitary Sewer Project No. 4 – Sanitary Sewer Rehabilitation Phase II**

  This project focuses on rehabilitating the 10-inch and 8-inch gravity sanitary sewer line located in the oldest portion of the District and incorporates 7,000 feet of 8-inch and 3,000 feet of 10-inch pipe. This area was selected for rehabilitation as the clay pipe in this area is beyond its useful lifespan and is subject to deterioration.

  Preliminary cost estimates were generated for both trenchless rehabilitation and open cut for this project.

  Also included within the project estimated cost for CIPP lining estimate are twenty-five (25) – 10 LF point repairs, which will be required to be completed prior to lining of the pipe.

- **Sanitary Sewer Project No. 5 – Lift Station Nos. 3, 4, 6, 8 and 9 Rehabilitation**

Lift Station Nos. 3, 4, 6, 8, and 9 were installed in the early to mid 1990's and are reaching their useful life. All have hardware problems such as deteriorating pump rails, clogging pumps and electrical issues. The wet-wells for each of these lift stations are still structurally sound and can be still used. It should be noted that the influent line on Lift Station No. 6 has an adverse grade that will require replacement. To accomplish this a new wet well may be required to ensure the vault is low enough to allow the pipe to be installed correctly.

This project may be broken into several sub-phases depending on the availability of funding.

- **Sanitary Sewer Project No. 6 – Bonney Drive Sanitary Sewer Improvements**

  This project consists of rehabilitating the gravity sanitary sewer pipe located in Bonney Drive. Similar to the pipe in Project No. 2, this area has severe root issues. Trenchless rehabilitation is again recommended for this stretch of line.

  This project may be broken into several sub-phases depending on the availability of funding.

- **Sanitary Sewer Project No. 7 – Sanitary Sewer Rehabilitation Phase III**

  This project focuses on rehabilitating the 8-inch gravity sanitary sewer line located in the portion of the District bounded to the north by US Highway 160 and to the west by Adams Lane and incorporates approximately 7,000 feet of 8-inch pipe. This area was selected for rehabilitation as the clay pipe in this area is beyond its useful lifespan and is subject to deterioration.

  Preliminary cost estimates were generated for both trenchless rehabilitation and open cut for this project.

  Also included within the project estimated cost for CIPP lining estimate are fifteen (15) – 10 LF point repairs, which will be required to be completed prior to lining of the pipe.

The recommended project priorities and their respective costs for the sanitary sewer collection system are shown in Table 2-7.

Table 2-7: Sanitary Sewer Project Priority Summary

EAST ALAMOSA WATER & SANITATION DISTRICT Overall Collection System Improvements Summary September, 2019		RGA Job No.: 1017.0001
Priority	**Project Description**	**Project Cost**
	Lift Station No. 2 Replacement - Completed in 2016	$ -
	Lift Station No. 1 Replacement - Completed in 2016	$ -

1A	Sanitary Sewer Rehabillitation Project Phase I (Pipe Burst)	$	2,255,845
1B	Sanitary Sewer Rehabillitation Project Phase I (Open Cut)	$	2,337,014
1C	Sanitary Sewer Rehabillitation Project Phase I (CIPP)	$	995,525
2A	Sanitary Sewer Rehabilitation Phase II (Pipe Burst)	$	2,830,415
2B	Sanitary Sewer Rehabillitation Project Phase II (Open Cut)	$	2,971,772
2C	Sanitary Sewer Rehabilitation Phase II (CIPP)	$	1,217,885
3	Lift Station Nos. 3, 4, 6, 8 & 9	$	261,579
4	Bonney Drive Sanitary Sewer Improvements	$	13,283
5A	Sanitary Sewer Rehabilitation Phase III (Pipe Burst)	$	1,905,332
5B	Sanitary Sewer Rehabillitation Project Phase III (Open Cut)	$	2,070,480
5C	Sanitary Sewer Rehabilitation Phase III (CIPP)	$	840,213
ESTIMATED SANITARY SEWER IMPROVEMENT COST*		**$**	**7,654,127**

*Note: Assumes highest cost between Pipe Burst, Open Cut and CIPP.

3 PRELIMINARY CIP SUMMARY AND CONCLUSION

The recommended improvements for both the distribution and collection system were ordered into project priorities. As discussed, these priorities are based off of operation and maintenance time spent and operator recommendation. In the case of the Sanitary Sewer Rehabilitation Project Phase I and II, the cured-in-place method is recommended, which is the most cost effective of the three methods explored.

It is important to note that the preliminary cost estimates shown were developed after a cursory review of the condition of both systems. Further inspection may reveal additional areas where improvements are required. Detailed cost estimates for each project are located in the Appendix of this report.

Table 3-1: Overall Preliminary CIP Priorities

EAST ALAMOSA WATER & SANITATION DISTRICT

Overall Preliminary CIP Priorities

September, 2019 — **RGA Job No.: 1017.0001**

Priority	Project Description	Project Cost
1	Sanitary Sewer Rehabilitation Project Phase I (CIPP)	$ 995,525
2	Sanitary Sewer Rehabilitation Phase II (CIPP)	$ 1,217,885
3	Lift Station Nos. 3, 4, 6, 8 & 9	$ 261,579
4	Bonney Drive Sanitary Sewer Improvements	$ 13,283
5	Sanitary Sewer Rehabilitation Phase III (CIPP)	$ 840,213
6	Water Distribution System Improvements Phase I	$ 3,061,239
7	Water Distribution System Improvements Phase II	$ 1,172,182
8	Water Distribution System Improvements Phase III	$ 1,034,959
9	Water Distribution System Improvements Phase IV	$ 1,350,853
	ESTIMATED TOTAL CIP COST	**$ 9,947,718**

In addition to the project priorities listed here a preventative maintenance program should be undertaken for both the water distribution system and the sanitary sewer collection system. It is recommended that this program include the following tasks:

Water Distribution System

- Isolation Valve Exercise Program – Fully exercise each valve one to two times per year.
- Fire Hydrant Flushing Program – Operate and flush each fire hydrant once per year.
- Document All Maintenance Concerns and/or Observations

Sanitary Sewer Collection System

- Visually Inspect the Sanitary Sewer System, Update Maps, Document Areas of Concern
- Determine a Routine Sewer Main Jetting/Videoing Schedule
- Visually Inspect Each Lift Station Daily
- Form a Preventative Lift Station Maintenance Procedure
- Document All Maintenance Concerns and/or Observations

APPENDIX A: PRELIMINARY CIP COST ESTIMATES

EAST ALAMOSA WATER & SANITATION DISTRICT

Sanitary Sewer Rehabilitation Phase I (Pipe Bursting)
Project Priority No. 1

September, 2019 **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Construction Material					
1	8" DIA Trenchless Rehabilitation (Pipe Lining)	8,600	LF	$ 140	$ 1,204,000
2	Reconnection of Existing Services - Estimate	50	EA	$ 1,250	$ 62,500
3	Line Existing 4' Diameter Manhole	25	EA	$ 2,500	$ 62,500
				Sanitary Sewer Rehabilitation Subtotal	***$ 1,329,000***
Additional Contractor Costs					
3	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 19,935	$ 19,935
4	Mobilization / Demobilization / Site Restoration (10% of Material)	1	LS	$ 132,900	$ 132,900
5	Traffic Control (1.0% of Material)	1	LS	$ 13,290	$ 13,290
6	Construction Survey (2.0% of Material)	1	LS	$ 26,580	$ 26,580
7	Erosion Control (0.5% of Material)	1	LS	$ 6,645	$ 6,645
				Additional Contractor Costs Subtotal	***$ 199,350***
				CONSTRUCTION TOTAL	**$ 1,528,350**
Design & Construction Management					
8	Design Survey	1	LS	$ -	$ -
9	Engineering Design, Permitting and Bidding Services (8% of Construction Total)	1	LS	$ 122,268	$ 122,268
10	Construction management (15% of Construction Total)	1	LS	$ 229,253	$ 229,253
				DESIGN & CONST. MANAGEMENT TOTAL	**$ 351,521**
				Construction and Design Total	***$ 1,879,871***
11	Contingency (20% of Total Cost)	1	LS	$ 375,974	$ 375,974
				ESTIMATED TOTAL PROJECT COST	**$ 2,255,845**

EAST ALAMOSA WATER & SANITATION DISTRICT

Sanitary Sewer Rehabilitation Phase I (Open Cut)
Project Priority No. 1

September, 2019 — **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Construction Material					
1	8" DIA SDR 35 PVC Pipe (Open Cut)	8,600	LF	$ 150	$ 1,290,000
2	Lining of Manholes	25	EA	$ 2,500	$ 62,500
				Sanitary Sewer Rehabilitation Subtotal	***$ 1,352,500***
Additional Contractor Costs					
3	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 20,288	$ 20,288
4	Mobilization / Demobilization / Site Restoration (10% of Material)	1	LS	$ 135,250	$ 135,250
5	Traffic Control (1.0% of Material)	1	LS	$ 13,525	$ 13,525
6	Construction Survey (2.0% of Material)	1	LS	$ 27,050	$ 27,050
7	Erosion Control (0.5% of Material)	1	LS	$ 6,763	$ 6,763
				Additional Contractor Costs Subtotal	***$ 202,875***
				CONSTRUCTION TOTAL	**$ 1,555,375**
Design & Construction Management					
8	Design Survey (4$ per Linear Foot of Line)	8,600	LS	$ 4	$ 34,400
9	Engineering Design, Permitting and Bidding Services (8% of Construction Total)	1	LS	$ 124,430	$ 124,430
10	Construction management (15% of Construction Total)	1	LS	$ 233,306	$ 233,306
				DESIGN & CONST. MANAGEMENT TOTAL	**$ 392,136**
				Construction and Design Total	***$ 1,947,511***
11	Contingency (20% of Total Cost)	1	LS	$ 389,502	$ 389,502
				ESTIMATED TOTAL PROJECT COST	**$ 2,337,014**

EAST ALAMOSA WATER & SANITATION DISTRICT

Sanitary Sewer Rehabilitation Phase I (Cure In Place Pipe)
Project Priority No. 1

September, 2019 **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Construction Material					
1	8" DIA Trenchless Rehabilitation (Cure in Place Pipe)	8,600	LF	$ 40	$ 344,000
2	10' Point Repairs required prior to Lining of Pipe	20	EA	$ 9,000	$ 180,000
3	Line Existing 4' Diameter Manhole	25	EA	$ 2,500	$ 62,500
				Sanitary Sewer Rehabilitation Subtotal	***$ 586,500***
Additional Contractor Costs					
3	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 8,798	$ 8,798
4	Mobilization / Demobilization / Site Restoration (10% of Material)	1	LS	$ 58,650	$ 58,650
5	Traffic Control (1.0% of Material)	1	LS	$ 5,865	$ 5,865
6	Construction Survey (2.0% of Material)	1	LS	$ 11,730	$ 11,730
7	Erosion Control (0.5% of Material)	1	LS	$ 2,933	$ 2,933
				Additional Contractor Costs Subtotal	***$ 87,975***
				CONSTRUCTION TOTAL	**$ 674,475**
Design & Construction Management					
8	Design Survey	1	LS	$ -	$ -
9	Engineering Design, Permitting and Bidding Services (8% of Construction Total)	1	LS	$ 53,958	$ 53,958
10	Construction management (15% of Construction Total)	1	LS	$ 101,171	$ 101,171
				DESIGN & CONST. MANAGEMENT TOTAL	**$ 155,129**
				Construction and Design Total	***$ 829,604***
11	Contingency (20% of Total Cost)	1	LS	$ 165,921	$ 165,921
				ESTIMATED TOTAL PROJECT COST	**$ 995,525**

EAST ALAMOSA WATER & SANITATION DISTRICT

Sanitary Sewer Rehabilitation Phase II (Pipe Bursting)
Project Priority No. 2

September, 2019 **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Construction Material					
1	8" DIA Trenchless Rehabilitation (Pipe Bursting)	7,000	LF	$ 140	$ 980,000
2	10" DIA Trenchless Rehabilitation (Pipe Bursting)	3,000	LF	$ 160	$ 480,000
3	Reconnect Existing Services - Estimate	116	EA	$ 1,250	$ 145,000
3	Line Existing 4' Diameter Manhole	25	EA	$ 2,500	$ 62,500
				Sanitary Sewer Rehabilitation Subtotal	***$ 1,667,500***
Additional Contractor Costs					
4	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 25,013	$ 25,013
5	Mobilization / Demobilization / Site Restoration (10% of Material)	1	LS	$ 166,750	$ 166,750
6	Traffic Control (1.0% of Material)	1	LS	$ 16,675	$ 16,675
7	Construction Survey (2.0% of Material)	1	LS	$ 33,350	$ 33,350
8	Erosion Control (0.5% of Material)	1	LS	$ 8,338	$ 8,338
				Additional Contractor Costs Subtotal	***$ 250,125***
				CONSTRUCTION TOTAL	**$ 1,917,625**
Design & Construction Management					
9	Design Survey	1	LS	$ -	$ -
10	Engineering Design, Permitting and Bidding Services (8% of Construction Total)	1	LS	$ 153,410	$ 153,410
11	Construction management (15% of Construction Total)	1	LS	$ 287,644	$ 287,644
				DESIGN & CONST. MANAGEMENT TOTAL	**$ 441,054**
				Construction and Design Total	***$ 2,358,679***
12	Contingency (20% of Total Cost)	1	LS	$ 471,736	$ 471,736
				ESTIMATED TOTAL PROJECT COST	**$ 2,830,415**

EAST ALAMOSA WATER & SANITATION DISTRICT

Sanitary Sewer Rehabilitation Phase II (Open Cut)
Project Priority No. 2

September, 2019 — **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Construction Material					
1	8" DIA SDR 35 PVC Pipe (Open Cut)	7,000	LF	$ 160	$ 1,120,000
2	10" DIA SDR 35 PVC Pipe (Open Cut)	3,000	LF	$ 180	$ 540,000
3	Line Existing 4' Diameter Manhole	25	EA	$ 2,500	$ 62,500
				Sanitary Sewer Rehabilitation Subtotal	***$ 1,722,500***
Additional Contractor Costs					
4	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 25,838	$ 25,838
5	Mobilization / Demobilization / Site Restoration (10% of Material)	1	LS	$ 172,250	$ 172,250
6	Traffic Control (1.0% of Material)	1	LS	$ 17,225	$ 17,225
7	Construction Survey (2.0% of Material)	1	LS	$ 34,450	$ 34,450
8	Erosion Control (0.5% of Material)	1	LS	$ 8,613	$ 8,613
				Additional Contractor Costs Subtotal	***$ 258,375***
				CONSTRUCTION TOTAL	**$ 1,980,875**
Design & Construction Management					
9	Design Survey (4$ per Linear Foot of Line)	10,000	LS	$ 4	$ 40,000
10	Engineering Design, Permitting and Bidding Services (8% of Construction Total)	1	LS	$ 158,470	$ 158,470
11	Construction management (15% of Construction Total)	1	LS	$ 297,131	$ 297,131
				DESIGN & CONST. MANAGEMENT TOTAL	**$ 495,601**
				Construction and Design Total	***$ 2,476,476***
12	Contingency (20% of Total Cost)	1	LS	$ 495,295	$ 495,295
				ESTIMATED TOTAL PROJECT COST	**$ 2,971,772**

EAST ALAMOSA WATER & SANITATION DISTRICT

Sanitary Sewer Rehabilitation Phase II (Cure In Place Pipe)
Project Priority No. 2

September, 2019 **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Construction Material					
1	8" DIA Trenchless Rehabilitation (Cure in Place Pipe)	7,000	LF	$ 40	$ 280,000
2	10" DIA Trenchless Rehabilitation (Cure in Place Pipe)	3,000	LF	$ 50	$ 150,000
3	10' Point Repairs required prior to Lining of Pipe	25	EA	$ 9,000	$ 225,000
4	Line Existing 4' Diameter Manhole	25	EA	$ 2,500	$ 62,500
	Sanitary Sewer Rehabilitation Subtotal				***$ 717,500***
Additional Contractor Costs					
4	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 10,763	$ 10,763
5	Mobilization / Demobilization / Site Restoration (10% of Material)	1	LS	$ 71,750	$ 71,750
6	Traffic Control (1.0% of Material)	1	LS	$ 7,175	$ 7,175
7	Construction Survey (2.0% of Material)	1	LS	$ 14,350	$ 14,350
8	Erosion Control (0.5% of Material)	1	LS	$ 3,588	$ 3,588
	Additional Contractor Costs Subtotal				***$ 107,625***
	CONSTRUCTION TOTAL				**$ 825,125**
Design & Construction Management					
9	Design Survey	1	LS	$ -	$ -
10	Engineering Design, Permitting and Bidding Services (8% of Construction Total)	1	LS	$ 66,010	$ 66,010
11	Construction management (15% of Construction Total)	1	LS	$ 123,769	$ 123,769
	DESIGN & CONST. MANAGEMENT TOTAL				**$ 189,779**
	Construction and Design Total				***$ 1,014,904***
12	Contingency (20% of Total Cost)	1	LS	$ 202,981	$ 202,981
	ESTIMATED TOTAL PROJECT COST				**$ 1,217,885**

EAST ALAMOSA WATER & SANITATION DISTRICT

Existing Lift Station Nos. 3, 4, 6, 8 & 9 Rehabilitation
Project Priority No. 3

September, 2019 **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Lift Station Material					
1	Pumps, Rails, Chains, Floats, Valves and Control Panel	5	EA	$ 30,000	$ 150,000
2	Correct Reverse Grade on L.S. No. 6 Influent Line)	1	LS	$ 20,000	$ 20,000
				Lift Station Subtotal	***$ 170,000***
Additional Contractor Costs					
3	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 2,550	$ 2,550
4	Mobilization / Demobilization	1	LS	$ 17,000	$ 17,000
				Additional Contractor Costs Subtotal	***$ 19,550***
				CONSTRUCTION TOTAL	**$ 189,550**
Design & Construction Management					
5	Engineering Design, Permitting and Bidding Services (15% of Construction Total)	1	LS	$ 28,433	$ 28,433
				DESIGN & CONST. MANAGEMENT TOTAL	**$ 28,433**
				Construction and Design Total	***$ 217,983***
6	Contingency (20% of Total Cost)	1	LS	$ 43,597	$ 43,597
				ESTIMATED TOTAL PROJECT COST	**$ 261,579**

EAST ALAMOSA WATER & SANITATION DISTRICT

Bonney Drive Sanitary Sewer Repair
Project Priority No. 4

September, 2019 **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Construction Material					
1	4' Diameter Manhole	1	EA	$ 4,500	$ 4,500
2	8" Diameter SDR35 Sanitary Sewer Pipe	20	LF	$ 160	$ 3,200
				Sanitary Sewer Repair Subtotal	***$ 7,700***
Additional Contractor Costs					
3	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 116	$ 116
4	Mobilization / Demobilization / Site Restoration (10% of Material)	1	LS	$ 770	$ 770
5	Traffic Control (1.0% of Material)	1	LS	$ 77	$ 77
6	Construction Survey (2.0% of Material)	1	LS	$ 154	$ 154
7	Erosion Control (0.5% of Material)	1	LS	$ 39	$ 39
				Additional Contractor Costs Subtotal	***$ 1,155***
				CONSTRUCTION TOTAL	**$ 8,855**
Design & Construction Management					
8	Design Survey (2% of Construction Total)	1	LS	$ 177	$ 177
9	Engineering Design, Permitting and Bidding Services (8% of Construction Total)	1	LS	$ 708	$ 708
10	Construction management (15% of Construction Total)	1	LS	$ 1,328	$ 1,328
				DESIGN & CONST. MANAGEMENT TOTAL	**$ 2,214**
				Construction and Design Total	***$ 11,069***
11	Contingency (20% of Total Cost)	1	LS	$ 2,214	$ 2,214
				ESTIMATED TOTAL PROJECT COST	**$ 13,283**

EAST ALAMOSA WATER & SANITATION DISTRICT

Sanitary Sewer Rehabilitation Phase III (Pipe Bursting)
Project Priority No. 5

September, 2019 **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Construction Material					
1	8" DIA Trenchless Rehabilitation (Pipe Bursting)	7,000	LF	$ 140	$ 980,000
2	Reconnection of Existing Services - Estimate	50	EA	$ 1,250	$ 62,500
3	Line Existing 4' Diameter Manhole	32	EA	$ 2,500	$ 80,000
				Sanitary Sewer Rehabilitation Subtotal	***$ 1,122,500***
Additional Contractor Costs					
3	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 16,838	$ 16,838
4	Mobilization / Demobilization / Site Restoration (10% of Material)	1	LS	$ 112,250	$ 112,250
5	Traffic Control (1.0% of Material)	1	LS	$ 11,225	$ 11,225
6	Construction Survey (2.0% of Material)	1	LS	$ 22,450	$ 22,450
7	Erosion Control (0.5% of Material)	1	LS	$ 5,613	$ 5,613
				Additional Contractor Costs Subtotal	***$ 168,375***
				CONSTRUCTION TOTAL	**$ 1,290,875**
Design & Construction Management					
8	Design Survey	1	LS	$ -	$ -
9	Engineering Design, Permitting and Bidding Services (8% of Construction Total)	1	LS	$ 103,270	$ 103,270
10	Construction management (15% of Construction Total)	1	LS	$ 193,631	$ 193,631
				DESIGN & CONST. MANAGEMENT TOTAL	**$ 296,901**
				Construction and Design Total	***$ 1,587,776***
11	Contingency (20% of Total Cost)	1	LS	$ 317,555	$ 317,555
				ESTIMATED TOTAL PROJECT COST	**$ 1,905,332**

EAST ALAMOSA WATER & SANITATION DISTRICT

Sanitary Sewer Rehabilitation Phase III (Open Cut)
Project Priority No. 5

September, 2019 — **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Construction Material					
1	8" DIA SDR 35 PVC Pipe (Open Cut)	7,000	LF	$ 160	$ 1,120,000
3	Line Existing 4' Diameter Manhole	32	EA	$ 2,500	$ 80,000
				Sanitary Sewer Rehabilitation Subtotal	***$ 1,200,000***
Additional Contractor Costs					
4	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 18,000	$ 18,000
5	Mobilization / Demobilization / Site Restoration (10% of Material)	1	LS	$ 120,000	$ 120,000
6	Traffic Control (1.0% of Material)	1	LS	$ 12,000	$ 12,000
7	Construction Survey (2.0% of Material)	1	LS	$ 24,000	$ 24,000
8	Erosion Control (0.5% of Material)	1	LS	$ 6,000	$ 6,000
				Additional Contractor Costs Subtotal	***$ 180,000***
				CONSTRUCTION TOTAL	**$ 1,380,000**
Design & Construction Management					
9	Design Survey (4$ per Linear Foot of Line)	7,000	LF	$ 4	$ 28,000
10	Engineering Design, Permitting and Bidding Services (8% of Construction Total)	1	LS	$ 110,400	$ 110,400
11	Construction management (15% of Construction Total)	1	LS	$ 207,000	$ 207,000
				DESIGN & CONST. MANAGEMENT TOTAL	**$ 345,400**
				Construction and Design Total	***$ 1,725,400***
12	Contingency (20% of Total Cost)	1	LS	$ 345,080	$ 345,080
				ESTIMATED TOTAL PROJECT COST	**$ 2,070,480**

EAST ALAMOSA WATER & SANITATION DISTRICT

Sanitary Sewer Rehabilitation Phase III (Cure In Place Pipe)
Project Priority No. 5

September, 2019 **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Construction Material					
1	8" DIA Trenchless Rehabilitation (Cure in Place Pipe)	7,000	LF	$ 40	$ 280,000
2	10' Point Repairs required prior to Lining of Pipe	15	EA	$ 9,000	$ 135,000
3	Line Existing 4' Diameter Manhole	32	EA	$ 2,500	$ 80,000
				Sanitary Sewer Rehabilitation Subtotal	***$ 495,000***
Additional Contractor Costs					
3	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 7,425	$ 7,425
4	Mobilization / Demobilization / Site Restoration (10% of Material)	1	LS	$ 49,500	$ 49,500
5	Traffic Control (1.0% of Material)	1	LS	$ 4,950	$ 4,950
6	Construction Survey (2.0% of Material)	1	LS	$ 9,900	$ 9,900
7	Erosion Control (0.5% of Material)	1	LS	$ 2,475	$ 2,475
				Additional Contractor Costs Subtotal	***$ 74,250***
				CONSTRUCTION TOTAL	**$ 569,250**
Design & Construction Management					
8	Design Survey	1	LS	$ -	$ -
9	Engineering Design, Permitting and Bidding Services (8% of Construction Total)	1	LS	$ 45,540	$ 45,540
10	Construction management (15% of Construction Total)	1	LS	$ 85,388	$ 85,388
				DESIGN & CONST. MANAGEMENT TOTAL	**$ 130,928**
				Construction and Design Total	***$ 700,178***
11	Contingency (20% of Total Cost)	1	LS	$ 140,036	$ 140,036
				ESTIMATED TOTAL PROJECT COST	**$ 840,213**

EAST ALAMOSA WATER & SANITATION DISTRICT

Overall Collection System Improvements Summary

September, 2019 **RGA Job No.: 1017.0001**

Priority	Project Description	Project Cost
	Lift Station No. 2 Replacement - Completed in 2016	$ -
	Lift Station No. 1 Replacement - Completed in 2016	$ -
1A	Sanitary Sewer Rehabillitation Project Phase I (Pipe Burst)	$ 2,255,845
1B	Sanitary Sewer Rehabillitation Project Phase I (Open Cut)	$ 2,337,014
1C	Sanitary Sewer Rehabillitation Project Phase I (CIPP)	$ 995,525
2A	Sanitary Sewer Rehabilitation Phase II (Pipe Burst)	$ 2,830,415
2B	Sanitary Sewer Rehabillitation Project Phase II (Open Cut)	$ 2,971,772
2C	Sanitary Sewer Rehabilitation Phase II (CIPP)	$ 1,217,885
3	Lift Station Nos. 3, 4, 6, 8 & 9	$ 261,579
4	Bonney Drive Sanitary Sewer Improvements	$ 13,283
5A	Sanitary Sewer Rehabilitation Phase III (Pipe Burst)	$ 1,905,332
5B	Sanitary Sewer Rehabillitation Project Phase III (Open Cut)	$ 2,070,480
5C	Sanitary Sewer Rehabilitation Phase III (CIPP)	$ 840,213
	ESTIMATED SANITARY SEWER IMPROVEMENT COST*	**$ 7,654,127**

*Note: Assumes highest cost between Pipe Burst, Open Cut and CIPP.

EAST ALAMOSA WATER & SANITATION DISTRICT

Water Distribution System Improvements (Open Cut)
Project Priority 1

September 1, 2019 — **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Construction Material					
1	6" DIA C900 PVC	12,627	LF	$ 140	$ 1,767,780
				Water Distribution System Improvements Subtotal	***$ 1,767,780***
Additional Contractor Costs					
2	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 26,517	$ 26,517
3	Mobilization / Demobilization / Site Restoration (10% of Material)	1	LS	$ 176,778	$ 176,778
4	Traffic Control (1.0% of Material)	1	LS	$ 17,678	$ 17,678
5	Construction Survey (2.0% of Material)	1	LS	$ 35,356	$ 35,356
6	Erosion Control (0.5% of Material)	1	LS	$ 8,839	$ 8,839
				Additional Contractor Costs Subtotal	***$ 265,167***
				CONSTRUCTION TOTAL	**$ 2,032,947**
Design & Construction Management					
7	Design Survey (4$ per Linear Foot of Line)	12,627	LS	$ 4	$ 50,508
8	Engineering Design, Permitting and Bidding Services (8% of Construction Total)	1	LS	$ 162,636	$ 162,636
9	Construction management (15% of Construction Total)	1	LS	$ 304,942	$ 304,942
				.	**$ 518,086**
				Construction and Design Total	***$ 2,551,033***
10	Contingency (20% of Total Cost)	1	LS	$ 510,207	$ 510,206.56
				ESTIMATED TOTAL PROJECT COST	**$ 3,061,239**

EAST ALAMOSA WATER & SANITATION DISTRICT

Water Distribution System Improvements (Pipe Bursting)
Project Priority 1

September 1, 2019 — **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Construction Material					
1	6" DIA C900 Fusible PVC	12,627	LF	$ 120	$ 1,515,240
2	Excavations for Reconnection	116	EA	$ 1,500	$ 174,000
	Water Distribution System Improvements Subtotal				***$ 1,689,240***
Additional Contractor Costs					
2	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 25,339	$ 25,339
3	Mobilization / Demobilization / Site Restoration (10% of Material)	1	LS	$ 168,924	$ 168,924
4	Traffic Control (1.0% of Material)	1	LS	$ 16,892	$ 16,892
5	Construction Survey (2.0% of Material)	1	LS	$ 33,785	$ 33,785
6	Erosion Control (0.5% of Material)	1	LS	$ 8,446	$ 8,446
	Additional Contractor Costs Subtotal				***$ 253,386***
	CONSTRUCTION TOTAL				**$ 1,942,626**
Design & Construction Management					
7	Design Survey (4$ per Linear Foot of Line)	12,627	LS	$ 4	$ 50,508
8	Engineering Design, Permitting and Bidding Services (8% of Construction Total)	1	LS	$ 155,410	$ 155,410
9	Construction management (15% of Construction Total)	1	LS	$ 291,394	$ 291,394
	.				**$ 497,312**
	Construction and Design Total				***$ 2,439,938***
10	Contingency (20% of Total Cost)	1	LS	$ 487,988	$ 487,987.60
	ESTIMATED TOTAL PROJECT COST				**$ 2,927,926**

EAST ALAMOSA WATER & SANITATION DISTRICT

Water Distribution System Improvements (Open Cut)
Project Priority 2

September 1, 2019 — **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Construction Material					
1	6" DIA C900 PVC	4,265	LF	$ 140	$ 597,100
2	8" DIA C900 PVC	500	LF	$ 160	$ 80,000
	Water Distribution System Improvements Subtotal				***$ 677,100***
Additional Contractor Costs					
3	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 10,157	$ 10,157
4	Mobilization / Demobilization / Site Restoration (10% of Material)	1	LS	$ 67,710	$ 67,710
5	Traffic Control (1.0% of Material)	1	LS	$ 6,771	$ 6,771
6	Construction Survey (2.0% of Material)	1	LS	$ 13,542	$ 13,542
7	Erosion Control (0.5% of Material)	1	LS	$ 3,386	$ 3,386
	Additional Contractor Costs Subtotal				***$ 101,565***
	CONSTRUCTION TOTAL				**$ 778,665**
Design & Construction Management					
8	Design Survey (4$ per Linear Foot of Line)	4,765	LS	$ 4	$ 19,060
9	Engineering Design, Permitting and Bidding Services (8% of Construction Total)	1	LS	$ 62,293	$ 62,293
10	Construction management (15% of Construction Total)	1	LS	$ 116,800	$ 116,800
	DESIGN & CONST. MANAGEMENT TOTAL				**$ 198,153**
	Construction and Design Total				***$ 976,818***
11	Contingency (20% of Total Cost)	1	LS	$ 195,364	$ 195,364
	ESTIMATED TOTAL PROJECT COST				**$ 1,172,182**

EAST ALAMOSA WATER & SANITATION DISTRICT

Water Distribution System Improvements (Pipe Bursting)
Project Priority 2

September 1, 2019 — **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Construction Material					
1	6" DIA C900 Fusible PVC	4,265	LF	$ 120	$ 511,800
2	8" DIA C900 Fusible PVC	500	LF	$ 140	$ 70,000
3	Excavations for Reconnection	26	EA	$ 2,500	$ 65,000
	Water Distribution System Improvements Subtotal				***$ 581,800***
Additional Contractor Costs					
3	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 8,727	$ 8,727
4	Mobilization / Demobilization / Site Restoration (10% of Material)	1	LS	$ 58,180	$ 58,180
5	Traffic Control (1.0% of Material)	1	LS	$ 5,818	$ 5,818
6	Construction Survey (2.0% of Material)	1	LS	$ 11,636	$ 11,636
7	Erosion Control (0.5% of Material)	1	LS	$ 2,909	$ 2,909
	Additional Contractor Costs Subtotal				***$ 87,270***
	CONSTRUCTION TOTAL				**$ 669,070**
Design & Construction Management					
8	Design Survey (4$ per Linear Foot of Line)	4,765	LS	$ 4	$ 19,060
9	Engineering Design, Permitting and Bidding Services (8% of Construction Total)	1	LS	$ 53,526	$ 53,526
10	Construction management (15% of Construction Total)	1	LS	$ 100,361	$ 100,361
	DESIGN & CONST. MANAGEMENT TOTAL				**$ 172,946**
	Construction and Design Total				***$ 842,016***
11	Contingency (20% of Total Cost)	1	LS	$ 168,403	$ 168,403
	ESTIMATED TOTAL PROJECT COST				**$ 1,010,419**

EAST ALAMOSA WATER & SANITATION DISTRICT

Water Distribution System Improvements (Open Cut)
Project Priority 3

September 1, 2019 — **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Construction Material					
1	6" DIA C900 PVC	4,269	LF	$ 140	$ 597,660
	Water Distribution System Improvements Subtotal				***$ 597,660***
Additional Contractor Costs					
2	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 8,965	$ 8,965
3	Mobilization / Demobilization / Site Restoration (10% of Material)	1	LS	$ 59,766	$ 59,766
4	Traffic Control (1.0% of Material)	1	LS	$ 5,977	$ 5,977
5	Construction Survey (2.0% of Material)	1	LS	$ 11,953	$ 11,953
6	Erosion Control (0.5% of Material)	1	LS	$ 2,988	$ 2,988
	Additional Contractor Costs Subtotal				***$ 89,649***
	CONSTRUCTION TOTAL				**$ 687,309**
Design & Construction Management					
7	Design Survey (4$ per Linear Foot of Line)	4,269	LS	$ 4	$ 17,076
8	Engineering Design, Permitting and Bidding Services (8% of Construction Total)	1	LS	$ 54,985	$ 54,985
9	Construction management (15% of Construction Total)	1	LS	$ 103,096	$ 103,096
	DESIGN & CONST. MANAGEMENT TOTAL				**$ 175,157**
	Construction and Design Total				***$ 862,466***
10	Contingency (20% of Total Cost)	1	LS	$ 172,493	$ 172,493
	ESTIMATED TOTAL PROJECT COST				**$ 1,034,959**

EAST ALAMOSA WATER & SANITATION DISTRICT

Water Distribution System Improvements (Pipe Bursting)
Project Priority 3

September 1, 2019 — **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Construction Material					
1	6" DIA C900 Fusible PVC	4,269	LF	$ 120	$ 512,280
2	Excavations for Reconnection	25	EA	$ 2,500	$ 62,500
	Water Distribution System Improvements Subtotal				***$ 574,780***
Additional Contractor Costs					
2	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 8,622	$ 8,622
3	Mobilization / Demobilization / Site Restoration (10% of Material)	1	LS	$ 57,478	$ 57,478
4	Traffic Control (1.0% of Material)	1	LS	$ 5,748	$ 5,748
5	Construction Survey (2.0% of Material)	1	LS	$ 11,496	$ 11,496
6	Erosion Control (0.5% of Material)	1	LS	$ 2,874	$ 2,874
	Additional Contractor Costs Subtotal				***$ 86,217***
	CONSTRUCTION TOTAL				**$ 660,997**
Design & Construction Management					
7	Design Survey (4$ per Linear Foot of Line)	4,269	LS	$ 4	$ 17,076
8	Engineering Design, Permitting and Bidding Services (8% of Construction Total)	1	LS	$ 52,880	$ 52,880
9	Construction management (15% of Construction Total)	1	LS	$ 99,150	$ 99,150
	DESIGN & CONST. MANAGEMENT TOTAL				**$ 169,105**
	Construction and Design Total				***$ 830,102***
10	Contingency (20% of Total Cost)	1	LS	$ 166,020	$ 166,020
	ESTIMATED TOTAL PROJECT COST				**$ 996,123**

EAST ALAMOSA WATER & SANITATION DISTRICT

Water Distribution System Improvements (Open Cut)
Project Priority 4

September 1, 2019 — **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Construction Material					
1	6" DIA C900 PVC	5,572	LF	$ 140	$ 780,080
				Water Distribution System Improvements Subtotal	***$ 780,080***
Additional Contractor Costs					
2	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 11,701	$ 11,701
3	Mobilization / Demobilization / Site Restoration (10% of Material)	1	LS	$ 78,008	$ 78,008
4	Traffic Control (1.0% of Material)	1	LS	$ 7,801	$ 7,801
5	Construction Survey (2.0% of Material)	1	LS	$ 15,602	$ 15,602
6	Erosion Control (0.5% of Material)	1	LS	$ 3,900	$ 3,900
				Additional Contractor Costs Subtotal	***$ 117,012***
				CONSTRUCTION TOTAL	**$ 897,092**
Design & Construction Management					
7	Design Survey (4$ per Linear Foot of Line)	5,572	LS	$ 4	$ 22,288
8	Engineering Design, Permitting and Bidding Services (8% of Construction Total)	1	LS	$ 71,767	$ 71,767
9	Construction management (15% of Construction Total)	1	LS	$ 134,564	$ 134,564
				DESIGN & CONST. MANAGEMENT TOTAL	**$ 228,619**
				Construction and Design Total	***$ 1,125,711***
10	Contingency (20% of Total Cost)	1	LS	$ 225,142	$ 225,142
				ESTIMATED TOTAL PROJECT COST	**$ 1,350,853**

EAST ALAMOSA WATER & SANITATION DISTRICT

Water Distribution System Improvements (Pipe Bursting)
Project Priority 4

September 1, 2019 — **RGA Job No.: 1017.0001**

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	SUBTOTAL
Construction Material					
1	6" DIA Fusible C900 PVC	5,572	LF	$ 120	$ 668,640
2	Excavations for Reconnection	24	EA	$ 2,500	$ 60,000
	Water Distribution System Improvements Subtotal				***$ 668,640***
Additional Contractor Costs					
2	Contractor Bonding and Insurance (1.5% of Material)	1	LS	$ 10,030	$ 10,030
3	Mobilization / Demobilization / Site Restoration (10% of Material)	1	LS	$ 66,864	$ 66,864
4	Traffic Control (1.0% of Material)	1	LS	$ 6,686	$ 6,686
5	Construction Survey (2.0% of Material)	1	LS	$ 13,373	$ 13,373
6	Erosion Control (0.5% of Material)	1	LS	$ 3,343	$ 3,343
	Additional Contractor Costs Subtotal				***$ 100,296***
	CONSTRUCTION TOTAL				**$ 768,936**
Design & Construction Management					
7	Design Survey (4$ per Linear Foot of Line)	5,572	LS	$ 4	$ 22,288
8	Engineering Design, Permitting and Bidding Services (8% of Construction Total)	1	LS	$ 61,515	$ 61,515
9	Construction management (15% of Construction Total)	1	LS	$ 115,340	$ 115,340
	DESIGN & CONST. MANAGEMENT TOTAL				**$ 199,143**
	Construction and Design Total				***$ 968,079***
10	Contingency (20% of Total Cost)	1	LS	$ 193,616	$ 193,616
	ESTIMATED TOTAL PROJECT COST				**$ 1,161,695**

EAST ALAMOSA WATER & SANITATION DISTRICT

Overall Water Distribution System Improvements Summary

September, 2019 **RGA Job No.: 1017.0001**

Priority	Project Description	Project Cost
1A	Water Distribution System Improvements Phase I - Open Cut	$ 3,061,239
1B	Water Distribution System Improvements Phase I - Pipe Burst	$ 2,927,926
2A	Water Distribution System Improvements Phase II - Open Cut	$ 1,172,182
2B	Water Distribution System Improvements Phase II - Pipe Burst	$ 1,010,419
3A	Water Distribution System Improvements Phase III - Open Cut	$ 1,034,959
3B	Water Distribution System Improvements Phase III - Pipe Burst	$ 996,123
4A	Water Distribution System Improvements Phase IV - Open Cut	$ 1,350,853
4B	Water Distribution System Improvements Phase IV - Open Cut	$ 1,161,695
	***ESTIMATED WATER DISTRIBUTION IMPROVEMENT COST -**	**$ 6,619,234**

* Open Cut cost indicated as current stance by EPA does not allow pipe bursting of AC pipe

EAST ALAMOSA WATER & SANITATION DISTRICT

Overall Preliminary CIP Priorities

September, 2019 **RGA Job No.: 1017.0001**

Priority	Project Description	Project Cost
1	Sanitary Sewer Rehabillitation Project Phase I (CIPP)	$ 995,525
2	Sanitary Sewer Rehabilitation Phase II (CIPP)	$ 1,217,885
3	Lift Station Nos. 3, 4, 6, 8 & 9	$ 261,579
4	Bonney Drive Sanitary Sewer Improvements	$ 13,283
5	Sanitary Sewer Rehabilitation Phase III (CIPP)	$ 840,213
6	Water Distribution System Improvements Phase I - Open Cut	$ 3,061,239
7	Water Distribution System Improvements Phase II - Open Cut	$ 1,172,182
8	Water Distribution System Improvements Phase III - Open Cut	$ 1,034,959
9	Water Distribution System Improvements Phase IV - Open Cut	$ 1,350,853
	ESTIMATED TOTAL CIP COST	**$ 9,947,718**

EAST ALAMOSA WATER & SANITATION DISTRICT

February, 2013 **RGA Job No.: 1017.0001**

Item	Description	Estimated Cost
1	Finalize Capital Improvement Plan	$ 3,500
2	Perspective Project Analysis & Finalize Selected Project Scope	$ 5,500
3	Project Basemap / Survey / Geotechnical	$ 8,500
4	CDPHE Permitting (Lift Station)	$ 6,000
5	Preliminary Plans	$ 8,500
6	Final Plans	$ 10,500
7	Project Specifications	$ 7,500
	ESTIMATED TOTAL PROJECT COST	**$ 50,000**

APPENDIX B: PRELIMINARY CIP MAPS AND SCHEDULE

EAST ALAMOSA WATER AND SANITATION DISTRICT
SANITARY SEWER CIP PROJECT PRIORITY MAP

LEGEND

- SANITARY SEWER MANHOLE
- SANITARY SEWER
- CLEANOUT
- LIFT STATION
- SANITARY SEWER PLUG

CIP PROJECT PRIORITY LIST

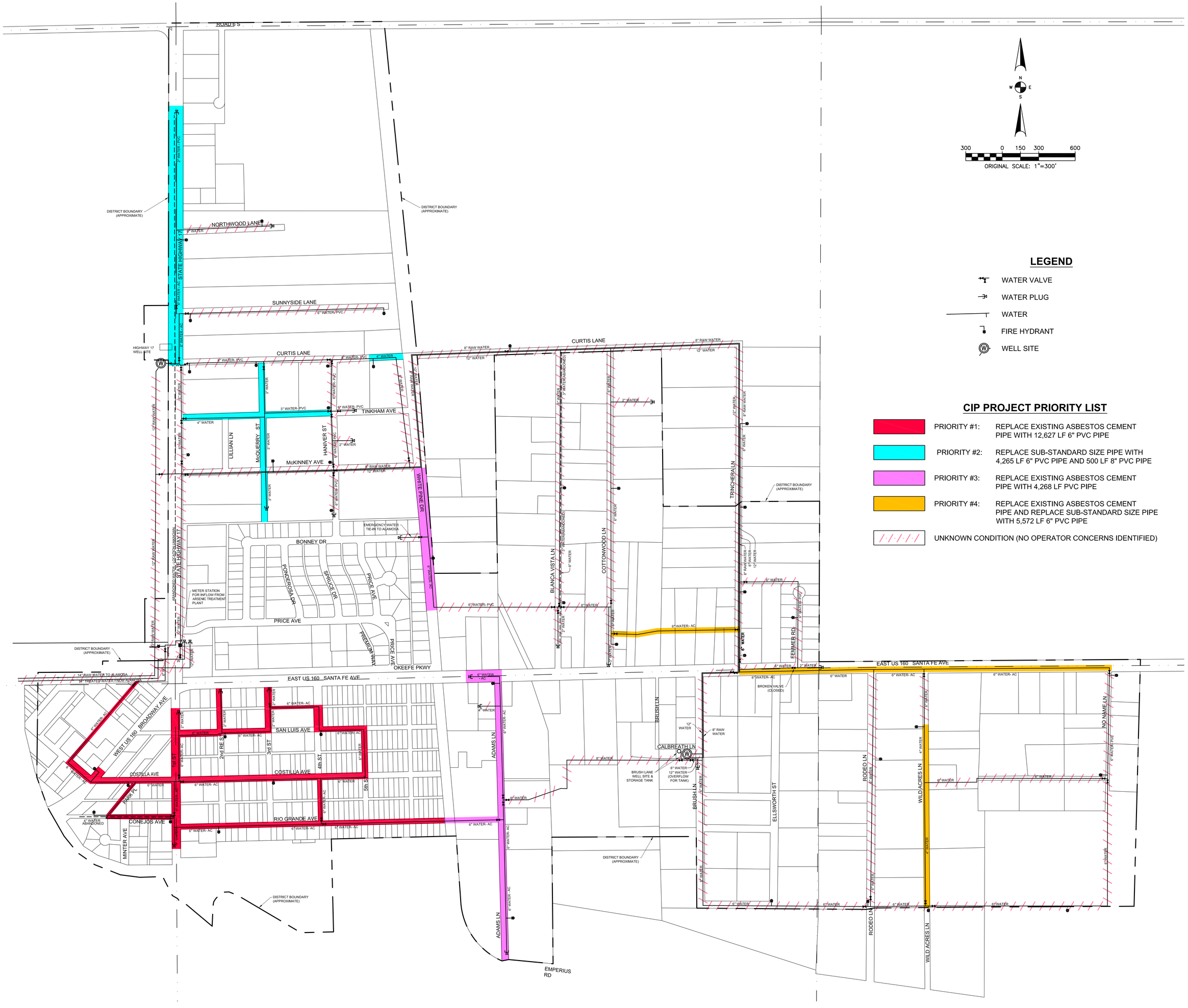
PRIORITY #1:	LIFT STATION #2 REPLACEMENT
PRIORITY #2:	8,600 L.F. 8" DIAMETER SANITARY SEWER REHABILITATION (ROOT ISSUES)
PRIORITY #3:	7,000 L.F. 8" DIAMETER SANITARY SEWER REHABILITATION 3,000 L.F. 10" DIAMETER SANITARY SEWER REHABILITATION
PRIORITY #4:	LIFT STATIONS 3,4,6,8 & 9 REHABILITATION
PRIORITY #5:	BONNEY DRIVE SANITARY SEWER POINT IMPROVEMENTS
	UNKNOWN CONDITION (NO OPERATOR CONCERNS IDENTIFIED)

RG AND ASSOCIATES, LLC
4875 Ward Road, Suite 100 • Wheat Ridge, CO • 80033
303-293-8107 • 303-293-8106 (fax) • www.rgengineers.com

OCTOBER, 2012

BASED ON RGA/OPERATOR MEETING ON 10/09/2012

EAST ALAMOSA WATER AND SANITATION DISTRICT
WATER MAIN CIP PROJECT PRIORITY MAP



LEGEND

- WATER VALVE
- WATER PLUG
- WATER
- FIRE HYDRANT
- WELL SITE

CIP PROJECT PRIORITY LIST

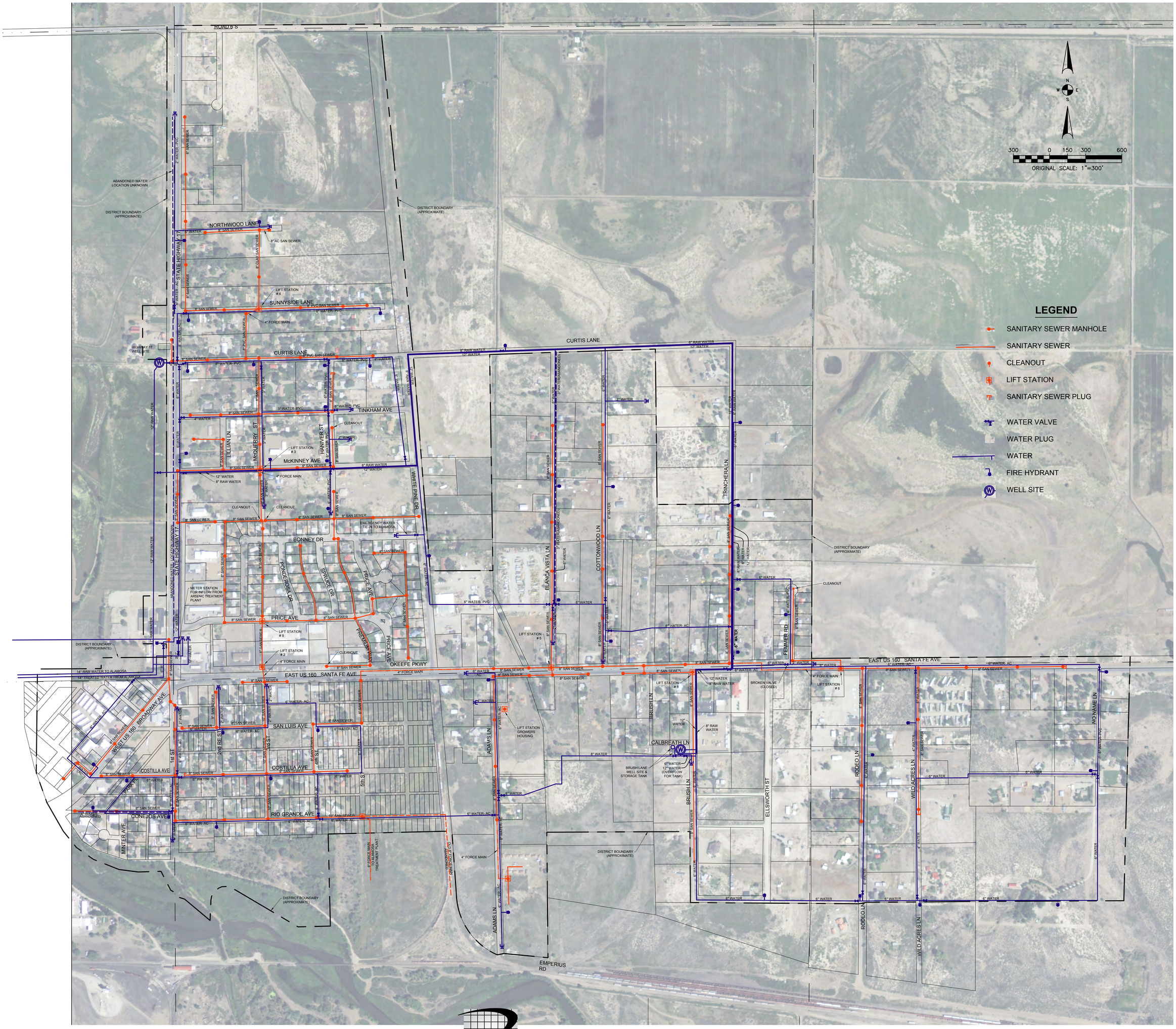
- PRIORITY #1: REPLACE EXISTING ASBESTOS CEMENT PIPE WITH 12,627 LF 6" PVC PIPE
- PRIORITY #2: REPLACE SUB-STANDARD SIZE PIPE WITH 4,265 LF 6" PVC PIPE AND 500 LF 8" PVC PIPE
- PRIORITY #3: REPLACE EXISTING ASBESTOS CEMENT PIPE WITH 4,268 LF PVC PIPE
- PRIORITY #4: REPLACE EXISTING ASBESTOS CEMENT PIPE AND REPLACE SUB-STANDARD SIZE PIPE WITH 5,572 LF 6" PVC PIPE
- UNKNOWN CONDITION (NO OPERATOR CONCERNS IDENTIFIED)

RG AND ASSOCIATES, LLC
4875 Ward Road, Suite 100 • Wheat Ridge, CO • 80033
303-293-8107 • 303-293-8106 (fax) • www.rgengineers.com

OCTOBER, 2012

BASED ON RGA/OPERATOR MEETING ON 10/09/2012

EAST ALAMOSA WATER AND SANITATION DISTRICT
UTILITY MAP



RG AND ASSOCIATES, LLC
4875 Ward Road, Suite 100 • Wheat Ridge, CO • 80033
303-293-8107 • 303-293-8106 (fax) • www.rgengineers.com

MAY, 2012

Steps for SRF and DOLA funding for East Alamosa Project

- Setup **CEOS account** and assign RGA as preparer
- Complete and submit the **Prequalification Form** (October 1, 2019)
- Attend **Pre-application Meeting** with CDPHE and DOLA (November 15, 2019)
- Receive **Planning Grant** from CWRPDA (December 16, 2019)
- Prepare **Project Needs Assessment** (February 17, 2020)
- Submit **DOLA EIAF Application** (April 1, 2020)
- **Design and Engineering Grant** awarded (April 15, 2020)
- **Public Meeting** presenting project (June 15, 2020)
- DOLA meeting on EIAF Application (July 1, 2020)
- Submit **Final Plans and Specifications** and **Loan Application** to CDPHE (October 15, 2020)
- CDPHE approves loan (February 17, 2021)
- Project is bid (March 15, 2021)

APPENDIX H:
1995 SITE APPLICATION

STATE OF COLORADO

Roy Romer, Governor
Patti Shwayder, Acting Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S.
Denver, Colorado 80222-1530
Phone (303) 692-2000

Laboratory Building
4210 E. 11th Avenue
Denver, Colorado 80220-3716
(303) 691-4700

Colorado Department
of Public Health
and Environment

February 21, 1996

Sally L. Salazar, President
East Alamosa Water and Sanitation District
P. O. Box 1092
Alamosa, CO 81101

RE: Site Application #4242
Upgrade of Seven (7) Lift Stations in East Alamosa Water and Sanitation District
Alamosa County

Dear Ms. Salazar:

The Water Quality Control Division has reviewed and evaluated your site application, supporting documentation and plans and specifications for the liftstations to be upgraded to serve East Alamosa Water and Sanitation District and discharge to the City of Alamosa wastewater treatment facility.

We find your site application to be in conformance with the Water Quality Control Commission's "Regulation for Site Applications for Domestic Wastewater Treatment Works." Therefore, the site application is approved with the following conditions listed below.

1. Based upon application information, the system design will be for:

Treatment Processes to be used	Peak Daily Flow Capacity
Lift Station #2	300 gpm
Lift Station #3	130 gpm
Lift Station #4	90 gpm
Lift Station #5	275 gpm
Lift Station #6	75 gpm
Lift Station #8	30 gpm
Growers Housing Lift Station	50 gpm

Design for values in excess of those contained above or failure to comply with any other conditions contained herein will render this approval void and another site application will have to be processed.

2. This site approval will expire one year from the date of this letter if the construction of the project has not commenced by that date. If expiration occurs, you must apply for a new site approval. Construction is defined as entering into a contract for the erection or physical placement of materials, equipment, piping, earthwork, or building which are to be a part of a domestic wastewater treatment works.

3. The applicant's registered engineer must furnish a statement prior to the commencement of operation stating that the facilities were constructed in conformance with approved plans, specifications, and change orders.

In accordance with Colorado Water Quality Control Commission regulations, this approval is subject to appeal as stated under Section 2.2.5 (7) of "Regulations for Site Applications for Domestic Wastewater Treatment Works."

These approvals do not relieve the owner from compliance with all county regulations prior to construction nor from responsibility for proper engineering, construction, and operation of the facility.

Please retain this letter for your permanent records.

Sincerely,

J. David Holm, Director
Water Quality Control Division
Colorado Department of Public Health and Environment

JDH:RHB:djd-Siteapp.8-99,100

cc: Alamosa County Sanitarian
Tom Bennett, Senior Planner, WQCD
Dave Akers, Permits & Enforcement, WQCD
Gary Soldano, District Engineer
Richard H. Bowman, District Engineer
Donna Davis, Grants Administrator, WQCD
Don Koskelin, City of Alamosa, PO Box 419, Alamosa, CO 81101
Davis Engineering, 576 Spruce Street, PO Box 130, Del Norte, CO 81132