

# Engineering Note

Monday, January 28, 2019 8:48 AM



*Solutions for Today...*

*Vision for Tomorrow*

August 14, 2017

Mayor John Bassett and Council  
c/o Juan Torres, Administrator  
Town of Edgewood  
1911 Historic Route 66  
Edgewood, New Mexico 87015  
*(Via Hand Delivery)*

Re: Town of Edgewood Wastewater Collection System Expansion 30% Conceptual Design  
SEC# 117102-00

Dear Mayor Bassett and Council:

Please find with this letter report, a copy of the 30% conceptual design drawings consisting of 50 sheets, and the Engineer's Opinion of Probable Project Costs. The conceptual design and the opinion of costs have been broken into separate parts referred to "areas" within the drawings and the report. Many of these areas can be constructed independent of the other areas in the effort to expand the system because they are hydraulically separated from each other in most instances. These areas are shown on sheet 2 of the plan set, and are described as follows:

- A) Main Street Area- The portion of the proposed system providing service to the Main Street and Cactus Road Area. This area is being finalized in the design of Phase I.
- B) Dunkin Road Area- This portion of the proposed system provides service to the area north of Church Street between Quail Trail and Williams Ranch Road.
- C) Quail Trail Area- This proposed area provides service to area between Church Street and the East Frontage Road between Cactus Road and Quail Trail. This area will ultimately discharge to the existing system by gravity or by a lift station depending on the alternative selection by the Town (to be discussed further).
- D) Range Road Area- The proposed service area between Quail Trail, and the existing lift station between Church Street and the East Frontage Road. This area will discharge into the existing lift station or the Williams Ranch Road Area, depending on a alternative selection by the Town.
- E) Williams Ranch Road Area- The portion of the proposed system east of the existing lift station on Church street to Williams Ranch Road. This area will discharge into a lift station at the intersection of Dunkin Road and Williams Ranch Road.
- F) NM 344 Area- This area is west of NM 344 across from Walmart.

2201 San Pedro Drive, NE  
Tel: 505-884-0700

Building 4, Suite 200

Albuquerque, NM 87110  
[www.smithengineering.pro](http://www.smithengineering.pro)

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- G) Route 66 Area- This area includes the expansion of the service area to South of Route 66 and for a portion of Entrada Del Norte.
- H) Edgewood 7 Area- This portion includes the expansion of the collection system to the area between Edgewood 7 and Mountainair Road from the end of the existing collection system to Hilltop Road.

#### **1. SCOPE OF CONCEPTUAL DESIGN**

The scope of conceptual design includes (and is described in the professional service agreement between the Town of Edgewood and Smith Engineering Company):

- A) Layout based on 2014 Aerial Imagery obtained by MRCOG and topography based on Santa Fe County 2ft interval contour data provided by the Town of Edgewood.
- B) Hydraulic analysis using the flow rates from the 2017 Preliminary Engineering Report for the Wastewater Treatment Facility.
- C) Smith completed some additional items that were not in the scope of the conceptual design phase in order to more accurately ascertain a layout for the proposed system. This included preliminary geotechnical investigations of approximately 24 locations, obtaining plats of the service area properties, and multiple coordination meetings with the Town. Some of this work was intended for the preliminary design phase, but it was determined that to provide the best layout some of this information need to be obtained prior to this phase of the design.

#### **2. HYDRAULIC ANALYSIS AND CONCEPTUAL DESIGN FINDINGS:**

The following results were obtained from the initial hydraulic analysis of the proposed system :

- A) 8" diameter is sufficient for the gravity line system. Greatest depth to diameter ratio is 0.42 and is located at the location where Alternative 1B and Alternative 2A discharge into the existing collection system. It is recommended that the maximum design depth to diameter ratio is 0.7.
- B) Manhole spacing is based on a maximum distance of 400 feet. Manhole spacing was adjusted to use property line spacing as much as possible for future development considerations.
- C) Rock is present throughout the Park Road and Pinon Road area, in addition to the Edgewood 7 area. The Main Street Area could have gravity flowed to the existing lift station, but the cost of Rock Excavation along Park Road made this infeasible. As such a lift station is proposed at the intersection of Cactus Road and Park Road.

- D) Three or four lift stations (depending on alternative 1 selection by the Town) will be required to serve the different areas.
- E) Additional small lift stations and gravity sewer laterals will be required to serve isolated lots along Park Road, Pinion Road and Capital Road.

### 3. ALTERNATIVES

For the design of the new sanitary collection system of the Town of Edgewood, Smith engineering analyzed two alternatives to direct waste water to the existing wastewater plant. The locations of the two alternatives are shown on Sheet 2 of the construction drawings.

#### ALTERNATIVE I

Option 1A consists of installing a lift station on Quail Trail near the existing Edgewood Senior Center. The new lift station would connect to the existing manhole on the southeast corner of the intersection of Quail Trail and Church Street. This alternative would require the Town of Edgewood to obtain easements to build the new lift station. The lift station would eventually service the existing and future residents located between Cactus Road and Capital Road/Quail Trail, south of Church Street.

Estimated Project Cost: \$388,000.00

#### Option 1A

PROS	CONS
Less Land (smaller easement)	Additional Maintenance
Less Capital Cost	Electrical power operating costs
	Additional Design Costs (Electrical)

Option 1B consist of installing approximately 3600 linear feet of pipe and nine new manholes to gravity feed the existing and future service connections between Cactus Road and Quail Trail along a drainage swale. The new infrastructure would be installed across the existing Edgewood Senior Center and cut diagonally towards the existing sewer system through private property. This alternative would connect to an existing manhole that is located west of the existing lift station.

Estimated Project Cost: \$414,000

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**Option 1B**

PROS	CONS
Less maintenance/ operating costs	Higher Capital Cost
No electrical power cost	Coordination with Landowners & Easements
Encourages Development	Potential Damage/ Infiltration from Floods

**ALTERNATIVE II**

Option 2A consists of approximately 3000 linear feet of gravity sewer line across private property to connect to Alternative 1B. If Option 1B is not selected than an additional 1000 LF of gravity sewer line to connect to a manhole west of the existing Lift Station will be required. A shallow gravity sewer line (<8 feet deep) would be installed to serve between North Odette Court and Williams Ranch Road. The feasibility of this option decreases if Alternative 1B is not selected.

Estimated Project Cost: \$489,000 (Assuming Alternative 1B is selected)

**Option 2A**

PROS	CONS
Smaller lift station on Dunkin Road	More infrastructure
Encourages Development	Larger Capital Cost
No Deep Sewer (safer maintenance/repair)	Coordination with Landowner & Easements
	Crosses Drainage Swale

Alternative 2B consists of installing deep sewer (greater than 16 feet deep) from east of North Odette Court almost to Williams Ranch Road. The amount of deep sewer would be approximately 1900 linear feet in length (shown on sheet 30 of the drawings). This alternative would increase the service area served by the Lift Station at Dunkin Road.

Estimated Project Cost: \$459,000

**Option 2B**

PROS	CONS
Less infrastructure	Larger Lift Station at the Dunkin Road Site

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Less Capital Costs	Deep sewer (> 16' deep) for 2000 LF
	Maintenance of deep sewer can be dangerous

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Less Capital Costs	Deep sewer (> 16' deep) for 2000 LF
	Maintenance of deep sewer can be dangerous
	Costly repairs to deep sewer lines
	Rock may be encountered at greater depths

#### 4. OPINION OF COSTS

Opinion of costs shown below and included in this submittal are based on the following:

- Based on preliminary quantities
- Include a contingency of 15%
- Includes fees for final design, electrical design and construction phase services
- Could be affected by future geotechnical investigations and may be more or less than current estimates
- Does not include road construction
- Does not account for environmental, cultural resource, or other studies
- Does not account for permitting or land acquisition costs

DESCRIPTION	TOTAL PROJECT COST
BID SCHEDULE 1: MAIN STREET AREA	\$720,000.00
BID SCHEDULE 2: DUNKIN ROAD AREA	\$2,262,000.00
BID SCHEDULE 3: QUAIL TRAIL AREA	\$3,849,000.00
BID SCHEDULE 4: RANGE ROAD AREA	\$1,404,000.00
BID SCHEDULE 5: WILLIAMS RANCH ROAD AREA	\$750,000.00
BID SCHEDULE 6: NM 344 AREA	\$1,259,000.00
BID SCHEDULE 7: ROUTE 66 AREA	\$583,000.00
BID SCHEDULE 8: EDGEWOOD 7 AREA	\$2,270,000.00
<b>TOTAL (WITHOUT ALTERNATIVES)</b>	<b>\$13,097,000.00</b>

handwritten notes:  
Plant design  
and meets  
original plan

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Alternative I	TOTAL PROJECT COST
BID SCHEDULE 1A: ALT 1A (LIFT STATION OPTION)	\$388,000.00
BID SCHEDULE 1B: ALT 1B (GRAVITY SEWER OPTION)	\$414,000.00

Alternative II	TOTAL PROJECT COST
BID SCHEDULE 2A: ALT 2A	\$489,000.00
BID SCHEDULE 4-2B: ALT 2B (DEEP SEWER OPTION)	\$459,000.00

## 5. CONCLUSION

Please notify Smith of the alternatives selected by the Town and provide any comments regarding the layout. Should you wish, Smith can meet with the council or representatives of the Town to provide additional information. Upon receipt of comments and acceptance of layout, Smith will proceed with the preliminary (60%) design phase.

At Smith Engineering it is our vision to serve our local communities with high quality, creative, value engineering through collaboration with our staff and clients. We are pleased to continue working with Town of Edgewood by providing solutions for today with visions of tomorrow.

Sincerely,

Smith Engineering Company



Cody Sipes, PE  
Project Manager

CLS/gk

CLS/gk

Enclosure: Wastewater Collection System Expansion 30% Conceptual Plans and Engineer's  
Opinion of Costs

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