



EDGEWOOD
NEW MEXICO

**Town of Edgewood
Wastewater System**

Asset Management

Plan

**Town of Edgewood
1911 Historic Route 66, P.O. Box 3610
Edgewood, NM 87015**

August 2015



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I have personally reviewed the Asset Management Plan as prepared by Paul Kinshella of EPCOR Water New Mexico, I fully understand and concur in the methods and procedures utilized in its preparation, I fully concur in the conclusions reached in the Plan, and I certify the report. I am a Registered Professional Engineer in New Mexico (NM PE 4115).



Raymond Lee Dennis, PE
Raymond Lee Dennis, NMPE 4115 09-03-2015

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Attachment A - Assets List, Condition, Remaining Life and Expected Life

Attachment B - Value of Asset

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Attachment E - Asset Location Map

Attachment F - Priority Replacement List

Attachment G - PowerPoint

Executive Summary

The Town of Edgewood wastewater system has experienced sudden and catastrophic equipment failures that were beyond the means of the town and wastewater customers to cover financially. In order to anticipate the needs for maintaining the assets in a workable condition, Edgewood elected to contract the development of this Asset Management Plan. This plan was developed using guidelines from the Environmental Protection Agency and the New Mexico Environment Department (NMED).

The next 20 years will require an investment of \$4,252,000 to maintain the current assets at the treatment plant in a working condition.

Years	Average Annual Investment
2015 - 2022	\$121,000
2023 - 2030	\$277,000
2031 - 2035	\$214,000

This Asset Management Plan recommends an approach to funding the replacement of assets as the present system exists. However, the level of costs identified in the Asset Management Plan are much higher than would be expected as typical for the volume of wastewater treated and the number of customers on the system. The cost of replacement of assets in the first eight years of the plan as outlined exceeds \$18.50 per 1000 gallons treated. This is very high compared to industry standards for the cost of wastewater service let alone for the replacement cost and is not sustainable for the town.

The treatment technology implemented in Edgewood is not compatible with the potable ground water chemistry. Alternatives for wastewater treatment that are compatible with the ground water quality in the area should be investigated, along with additions or modifications to the existing treatment system to reduce equipment (membrane) replacement costs.

This Asset Management Plan was developed in conjunction with the operation of the Edgewood Wastewater Treatment Facility (WWTF). The plant operators developed the condition assessment of all of the equipment in the overall inventory. The operation staff assisted in listing the manufacturer and model number data.

The replacement data was developed by the EPCOR Supply Chain, Wastewater Operation and Engineering staff. Material quotes were marked up to add the cost of installation and any temporary operation work required to install equipment.

The treatment plant has a rated capacity of 56,000 gallons per day at the five-day Biological Oxygen Demand, Total Suspended Solids and Total Kjeldahl Nitrogen design loading rates. The actual loading of these parameters experienced at the plant is twice the design loading. This would suggest the capacity of the actual installed equipment is closer to 28,000 gallons per day. The capacity at the plant is also conditional on the

Kubota membranes being fully functional. Under the new operating contract, life of these membranes has been increased to an estimated one (1) year rather than the originally expected eight (8) years. Even with the recently increased usable life, the plant does not have its fully rated capacity.

The financial model in this plan has a very high cost and is not sustainable for the town. The Town of Edgewood will need financial assistance in meeting the cost requirements for the WWTF as it exists now. This is primarily due to the limited life experienced by the Kubota membranes. The funding proposals recommended in this Asset Management Plan should to be implemented for a limited time while a Preliminary Engineering Report for wastewater collection, treatment and reuse in Edgewood is developed and implemented.

Chapter 1 Introduction

Edgewood is a town located on the high desert approximately 25 miles east of Albuquerque. The elevation of Edgewood is 6,700 feet. The town provides wastewater service to a portion of the commercial area along Historic Route 66 and the I-40 Interstate. At present, there are 23 customers connected to the wastewater system. The average wastewater flow is 18,000 gallons per day. The wastewater strength is very high as is expected of mostly commercial wastewater customers. The Biological Oxygen Demand, Total Suspended Solids and Total Kjeldahl Nitrogen are twice the strength used in the design of the treatment plant. This will be discussed in more detail later in the report.

Wastewater is collected via 3.2 miles of gravity collection system. A duplex pump station pumps through a 1.5 mile force main to the wastewater plant located 3.5 miles north and east of Town Hall.

The treatment facilities consist of:

- Screening
- Anoxic and Aerobic Bioreactor
- Membrane Filtration
- UV Disinfection
- Evaporation Lagoon
- Reuse Pump Station and Pipeline

The rated capacity of the treatment plant is 56,000 gallons per day. The high strength of the wastewater prevents the plant from treating this amount of flow. The Table “Design Parameters per “As-Constructed” Drawings” compares the design loading parameters to the actual loads the plant experiences.

The chemical quality of the water in the Edgewood service area is not compatible with the use of the Kubota membranes. The treatment plant operation is not viable without a change of the type of process or a change in the chemical quality of the wastewater.

Two major factors drive the requirement of this Asset Management Plan; the level of service the wastewater system is expected to achieve and the equipment that makes up the assets. The level of service can be summarized as:

- Meet the Permit
- Protect and Enhance the Environment
- Make the Wastewater Customers Successful

The levels of service were determined by considering the components of the wastewater system that needed to function properly to meet the criteria set forth in the NMED Asset Management Report Criteria. Meeting the permit is an essential level of service. If the system does not comply with the permit conditions, it cannot meet any of

the other levels of service. Protecting the environment makes the community a safe place to live. It keeps the drinking water safe and it enhances the natural habitat and adds to the values that the community experiences. The reclaimed water from the plant provides an additional water resource for the community. A properly operated and maintained wastewater system collects and treats the customer's wastewater in an unobtrusive and cost effective manner. The system must not have overflows, odors, or create a public nuisance. The system must be operated and maintained at a cost that allows the customers to be successful in their lives and businesses.

The Excel spreadsheet model is the implementation tool of the Asset Management Plan. This model has been placed into service by the plant operations staff. As equipment was replaced during the development of the model, the spreadsheet and resulting table was updated. This is evident with the replacement of the three sets of Kubota membranes. The life of the membranes was renewed and the replacement value of the membranes was updated.

This document recommends that the Asset Management Plan for the wastewater treatment facility be implemented. This will allow for some savings in the cost of maintaining the assets at the plant. There are opportunities for additional savings in the cost of wastewater treatment for Edgewood with other options.

More details on the alternatives and costs required to implement the options would be necessary for the policymakers in Edgewood to reach decisions on wastewater treatment. This information should be detailed in a Wastewater Preliminary Engineering Report that covers at least the next 25 years. The plan should detail the flows and loads for each five year period and develop a plan on how to meet those wastewater treatment requirements and should be reviewed on a five year basis to compare the actual conditions to the projections in the Preliminary Engineering Report.

Chapter 2 Asset Inventory

The first stage in developing an Asset Management Plan is the very important Asset Inventory. The development of the Asset Inventory consists of the following steps:

- Create a List of Assets
- Locate the Assets
- Determine Asset Condition
- Estimate Remaining Life and Service Life of the Asset
- Estimate the Value of the Asset
- Develop the Asset Inventory

Create a List of Assets

The start of the Asset Inventory is creating a list of assets through the review of the following sources:

- As Built Plans or Construction plans
- Construction Specifications
- Utility Mapping
- Visual Inspection
- Interviewing Town-Contracted Staff
- Discussions with Equipment Manufacturers and Suppliers

The list is organized into the following three groupings:

- Preliminary Treatment
- Bio-Reactor
- Ancillary Systems

The complete list of identified assets is in Attachment A. The following is a sample of the list for Preliminary Treatment:

List of Assets for Preliminary Treatment	
Plant Drain Lift Station	
Plant drain pump 1 & 2 – 2 Hp	Piping – 4" DIP
Check valve – 4" ball check	Valve, Discharge (drain) 4" DIP plug
Plant drain pump 2 – 2 Hp	Wet well – Concrete pipe 5' id
Sampler, Influent	Check valve – 4" ball check
Motor control center (DP-1, MCC1, Auto Tran, PLC)	
Screen 1	
Influent flow meter	Automatic fine drum screen
Screw conveyor	Influent valve – 6" plug
Piping – 6" DIP	
Headworks Ventilation	

Headworks ventilation	Exhaust fan – 275 CFM
Collection piping – 2”, 3” & 6” PVC	Flow switch
Hydrogen sulfide sensor – oxygen sensor	

Locate the Assets

In many Asset Management Plans the location of the asset is a challenge; however, for this particular plan, all of the assets are located at the Edgewood Wastewater Treatment Plant with the exception of the Church Street Lift Station and the gravity wastewater collection system. Attachment E shows the location of the assets.

Determine Asset Condition

Asset condition is determined through a combination of interviews with facility operators, visual inspection, and review of operational logs/history of repair. All three of these methods were adopted in preparation of this Asset Management Plan. Based on the condition reviews, each of the assets was categorized based on the following condition:

- New (100 % Service Life Remaining)
- Good (75% Service Life Remaining)
- Fair (50% Service Life Remaining)
- Worn (25% Service Life Remaining)
- Inoperable (Zero Service Life Remaining)

The number of assets per condition category is identified in the following table and is listed in Attachment A:

Number of Assets per Condition Category

Condition Category	Number of Assets
New	4
Good	166
Fair	13
Worn	22
Inoperable	16

The following is a sample of the Asset Condition for Preliminary Treatment:

Asset Condition for Preliminary Treatment

Plant Drain Lift Station			
Asset	Condition	Asset	Condition
Plant drain pump 1&2 – 2 Hp	Good	Wet well – Conc pipe 5' id	Good
Check valve – 4" ball check	Good	Sampler, influent	Inoperable
Plant drain pump 2 – 2 Hp	Worn	Piping – 4" DIP	Good
Motor control center (DP-1, MCC1, Auto tran, PLC)	New	Valve, Discharge (drain) 4" DIP plug	Good
		Check valve – 4" ball check	Good

Screen 1			
Asset	Condition	Asset	Condition
Influent flow meter	Good	Influent valve – 6" plug	Fair
Automatic fine drum screen	Inoperable	Piping – 6" DIP	Good
		Screw conveyor	Worn
Headworks Ventilation			
Asset	Condition	Asset	Condition
Headworks ventilation	Good	Exhaust fan – 275 CFM	Good
Collection Piping	Good	Flow switch	Good
		Hydrogen sulfide sensor – oxygen sensor	Inoperable

Estimate Remaining Life and Expected Life of the Asset

Asset life is variable and dependent on multiple factors including; original design life, appropriateness of installation, quality of original installation, effective planned maintenance programs, amount of use, and environmental factors.

The Remaining Life and Expected Life of the 220 assets are listed in Attachment A. The following is a sample of the Remaining Life and Service Life for Preliminary Treatment:

Remaining Life and Expected Life for Preliminary Treatment

Plant Drain Lift Station		
Asset	Remaining Life	Expected Life
Plant drain pump 1&2 – 2 Hp	3	8
Check valve – 4" ball check	3	8
Plant drain pump 2 – 2 Hp	2	8
Motor control center (DP-1, MCC1, Auto tran, PLC)	20	20
Wet well – Conc pipe 5' id	15	20
Sampler, influent	0	5
Piping – 4" DIP	15	20
Valve, Discharge (drain) 4" DIP plug	15	20
Check valve – 4" ball check	15	20
Screen 1		
Asset	Remaining Life	Expected Life
Influent flow meter	5	10
Automatic fine drum screen	0	20
Influent valve – 6" plug	5	10
Piping – 6" DIP	45	50
Screw conveyor	3	10
Headworks Ventilation		
Asset	Remaining Life	Expected Life
Headworks ventilation	15	20
Collection Piping – 2", 3" & 6" PVC	45	50
Exhaust fan – 275 CFM	15	20
Flow switch	15	20
Hydrogen sulfide sensor – oxygen sensor	0	5

Estimate the Value of the Asset

The estimated value of the asset is the current estimated replacement cost plus a labor allowance. The replacement cost can be estimated by the schedule of values from the original construction contract but this source was not available. If the schedule of values is not available, the estimates are accomplished based on equipment supply costs, EPCOR's experience at other plants, and other industry recognized estimating procedures. Only those assets with a replacement value in excess of \$2,000 have been included within the Asset Management Plan. Some of the assets within the Plan have individual components valued at less than \$2,000, but where the total of components in the asset are worth \$2,000 or more, the asset has been included in the Plan.

Since the Asset Management Plan is based on a planning horizon year of 20 years, to 2035, any asset that has a remaining life exceeding 20 years is not included in this

Asset Management Plan. Assets that fall into this classification generally consist of piping, manholes and buildings.

After combining assets with an individual value of less than \$2,000 and eliminating assets with a remaining life of 20 plus years, the total value of assets is \$1,070,581. These assets are listed in Attachment B. The following is a sample of the Values of the Assets for Preliminary Treatment totaling \$81,537:

Remaining Life and Expected Life for Preliminary Treatment

<u>Asset</u>	<u>Asset Value</u>
Preliminary Treatment	\$ 2,325
Plant Drain Station	
Plant drain dump - 1 & 2 - 2 Hp	\$ 4,500
Check valve - 4" ball check	\$ 2,250
Plant drain dump 2 - 2 Hp	\$ 4,500
Check valve - 4" ball check	\$ 2,250
Wet well - Conc pipe 5' id	\$ 6,000
Motor control center (DP-1, MCC1, auto tran, PLC)	\$ 28,050
Sampler, influent	\$ 3,750
Screen 1	
Influent flow meter	\$ 8,412
Automatic fine drum screen	\$ 7,500
Influent valve - 6" plug	\$ 3,000
Headworks Ventilation	
Exhaust fan - 275 CFM	\$ 4,500
Hydrogen sulfide sensor - oxygen sensor	\$ 4,500
Total for Preliminary Treatment	\$ 81,537

Chapter 3 Level of Service

Level of Service for the Customers and Stakeholders

The Level of Service for the Edgewood Asset Management Plan states the values for the Community and what is expected from the wastewater system to meet those values. These values are what the customers expect and the town will do to protect the public health of the community.

A Collection System That Functions Without Overflows

A wastewater utility has the responsibility to the community it serves to prevent collection system overflows. The sewer collection system must be maintained to be free of any matter that may cause blockages that could impede flow and cause overflows. Proper maintenance of the collection system will help to prevent overflows, and prevent leaks (or infiltration) that in turn present a risk to surrounding groundwater quality or increased risk of overflow. Proper maintenance will include cleaning and closed circuit television inspection of the lines on a ten year cycle. This frequency will be increased if issues are found in the gravity collection system.

Wastewater Must Be Properly Treated

The release of untreated wastewater into the environment promotes disease and degradation of water quality with respect to human, animal, and aquatic life. Proper wastewater treatment removes the carbon, nutrients, bacteriological and viral agents. After effective treatment, the effluent is nearly the same quality as the drinking water. The stated water quality requirement in the Ground Water Discharge Permit issued to the Edgewood Wastewater Treatment Facility is “to protect ground and surface water for present and potential future use as domestic and agricultural water supply and the other uses and protect public health.”

Wastewater Effluent Is Safely Discharged/Reused

Effluent from the Edgewood WWTF meets or exceeds permit requirements and is a valuable resource for various non-potable uses. When properly operated and maintained, the Edgewood WWTF can be expected to produce an effluent suitable either for safe disposal or for irrigation or other reclaimed uses in the community. Failure to meet permit requirements will generate a waste stream that is a liability to the town and community that will have to be disposed of by other more costly means. This Asset Management Plan is intended to ensure effluent from the Edgewood WWTF will continue to meet permit requirements for any reclaimed use and provide an asset to the town’s water resource portfolio.