
COST ASSESSMENT FOR THE

**SIERRA LOS PINOS PROPERTY OWNERS ASSOCIATION
WATER SYSTEM IMPROVEMENTS**

JANUARY 2011

Submitted To:
Suzanne Star, President
Sierra Los Pinos Property Owners Association
950 Forest Service Road 10
Jemez Springs, New Mexico 87025

Submitted By:
Medina Consulting, LLC
P.O. Box 94642
Albuquerque, New Mexico 87199
Contacts: A. Scott Medina, P.E.
Phone: (505) 264-2063

TABLE OF CONTENTS

- 1. GENERAL..... 1
- 2. Cost Assessment..... 2
 - A. System Design Criteria 2
 - 1. Water Demand..... 2
 - 2. Water Storage Analysis 3
 - B. Option Descriptions 4
 - 1. Option 1 – Water System Rehabilitation as Private Entity 4
 - 2. Option 2 – Water System Rehabilitation as Public Entity..... 6
- 3. Recommendation 7



*COST ASSESSMENT FOR
THE SIERRA LOS PINOS PROPERTY OWNERS ASSOCIATION
WATER SYSTEM IMPROVEMENTS*

1. GENERAL

In January 2011, the Sierra Los Pinos Property Owners Association (SLPPOA) contracted Medina Consulting, LLC to prepare a preliminary cost assessment for their existing water system. The purpose of this Assessment is to evaluate the costs associated with the rehabilitation, upgrades, and replacement of the water system for the Sierra Los Pinos subdivision. As such, the assessment will serve as the basis for funding needed for the identified water system improvements.

The project includes increasing the water storage capacity by building two new water storage tanks; installation of 29,000 linear feet of 4" waterlines; and installing individual meters on all existing service connections. The expansion of the water storage capacity will allow for two day storage capacity matching peak day demands estimates. Further, the installation of meters throughout the water system will provide needed upgrades to assist in tracking water usage, conserving water, and provide for household leak detection.

Over the last couple of years the community has begun to experience a series of system failures. Base on the water system asset inventory records, it can be concluded that the Sierra Los Pinos (SLP) water system infrastructure is in need of rehabilitation or replacement. In addition, many of the existing water system components have aged, and need to be rehabilitated in order to continue providing a safe and reliable drinking water supply for the community. Some examples are discussed below:

- The existing water system does not have the water storage capacity to meet current peak-day demands, and allow for system maintenance. It's standard practice to allow for 2-day storage in the event system maintenance is required on the wells and/or disinfection systems. During maintenance or repair, these facilities will be out of service for at least 24 to 36 hours.
- The existing water system needs household meters to allow proper water usage tracking, and service line isolation. Meters are an industry standard, which allows the water system to compare total water pumped from the supply well to total water consumed. This comparison is essential for maintaining a proper water balance and tracking water line leakage.
- Other water system deficiencies include undersized piping, deteriorating piping, and lacks of proper waterline bury depth.

These costs associated with these deficiencies are detailed below.

2. Cost Assessment

A. System Design Criteria

At this point in time, the Sierra Los Pinos subdivision is evaluating the costs associated with the rehabilitation of their existing water system. As such, the community has decided that its highest priority is the distribution system. As such, the community is considering the installation of meters based on industry standards and practices.

The design criteria for the water system were developed by Medina Consulting utilizing design criteria from industry standard principles, NMED regulatory guidelines and AWWA Standards.

The main objectives for the operation of the Sierra Los Pinos water system are:

- Provide a safe, continuous, adequate, and reliable water supply for the community.
- Design financially sustainable systems.
- Provide a water system designed to support realistic community growth.
- Provide adequate and reliable water supply.

1. Water Demand

The sizing of the system components is dependent upon water demand that the water system will experience at various times of operation. Water demand is measured in three categories or time scales, Average Daily Demand, Peak Daily Demand, and Peak Hourly Demand. These terms are defined below:

- **Average Daily Demand (ADD)** is the estimated average water consumption for each person by the system on an annual basis. The average daily demand is typically used to determine the annual water usage requirements and the system water rights requirements.
- **Peak Daily Demand (PDD)** is the maximum daily consumption estimated over a one year period. Peak daily demand is used to determine the maximum daily capacity needed of the water source, and disinfection system. The PDD is typically measured as a ratio of the average daily demand.
- **Peak Hourly Demand** is the maximum hourly consumption for the service area estimated on an annual basis. Peak hourly demand is used for determining the appropriate water storage tank size and the transmission and distribution system lines for a particular system. Peak hourly demand is typically measured as a ratio to the average daily demand, as well.

Based on these measurements, Median Consulting has determined projected design per capita demands for the Sierra Los Pinos water system. The design per capita demands used for the Sierra Los Pinos water system are shown below. The average daily demand is based on

existing operational demands extrapolated from New Mexico Office of the State Engineer well records and census data (2000) for Jemez Springs (2.37 people per household).

The peak day demand ratio is based on peak demands experienced with seasonal demand changes. The peak hour ratios were based on industry standard practices and are shown below.

Terms:

- Gallons per capita day = gpcd
- Gallon per minute = gpm
- Peaking Factor = PF

- Average Daily Demand: 120 gpcd
- Peak Daily Demand: 240 gpcd (2.0 times Average Day Demand)
- Peak Hour Demand: 480 gpcd (4 times Average Day Demand)

Assumptions:

- 2.37 people per dwelling
- 149 existing dwellings or service connections with the water system
 - 89 existing service connections for System 1
 - 66 existing service connections for System 2
- 164 developable lots or service connections
 - 92 future service connections for System 1
 - 72 future service connections for System 2

Table 1: 2011 SLPPOA Projected Water Demands Base on full build-out conditions		
Average Daily Demand (ADDx2.37x # of Conn.)	System 1	System 2
	26,165 gpd	20,477 gpd
Peak Daily Demand (ADDxPF)	52,330 gpd	40,954 gpd
Peak Hour Demand (ADD x PF)	72.7 gpm	41 gpm

2. Water Storage Analysis

The water storage analysis will evaluate recommendations for water storage based on the average daily demands and peak daily demands previously established in the system design criteria section. The main factor of this analysis includes equalizing storage. These are discussed below:

- Equalizing Storage is the volume required for proper operation of the well pumps and to meet the demands of the Peak Daily Demand.

Recommended Storage

The proposed water storage capacity needs to meet the current and future peak daily demand. As such, the water storage calculations are based on the projected population to be served by the water system and the average daily demands defined in Table 1. These storage requirements are shown in Table 2.

Table 2 Water Storage Requirements		
Storage Requirement	System 1	System 2
Recommended Storage	54,000 gallons	42,000 gallons

B. Option Descriptions

The Sierra Los Pinos Property Owners Association is considering the cost associated with the rehabilitation of their existing water system. These options include the Water System Rehabilitation as Private Entity (Option 1) and Water System Rehabilitation as Public Entity (Option 2). Each of these options is described in further detail in the following sections.

1. Option 1 – Water System Rehabilitation as Private Entity

The probable construction cost estimates for Option 1 improvements are shown in Table 3 & Table 4. These preliminary estimates are based on current material and labor costs realized by similar project improvements. Table 3 illustrates the probable construction costs associated with the selected improvements. Table 4 summarizes construction costs with probable “soft costs” or professional services required to complete the project. The following preliminary cost assessment is based on rehabilitating the existing water system in its current configuration. In addition, the cost assessment assumes the existing wells are in good condition, and do not need replacing. The quantities identified in Table 3 were determined based on the mapping provided by the SLPPOA. The assessment includes a 10% contingency for potential unforeseen items usually identified during the design phase.

Table 3: Sierra Los Pinos Property Owners Association Water System

PRELIMINARY ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

ITEM	DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL
System 1					
1	54,000 On Grade, Welded Steel Reservoir	LS	1	\$ 74,000.00	\$ 74,000.00
2	Concrete Ringwall	LS	1	\$ 5,000.00	\$ 5,000.00
3	Site Grading	CY	2000	\$ 2.50	\$ 5,000.00
4	Natural Gravel Surfacing, 4" thick	SY	2000	\$ 7.00	\$ 14,000.00
5	Site Clearing and Grubbing	AC	1.00	\$ 1,500.00	\$ 1,500.00
6	2" Waterline Pipe including fittings	LF	4500	\$ 12.00	\$ 54,000.00
7	4" Waterline Pipe including fittings	LF	12200	\$ 16.00	\$ 195,200.00
8	2" Gate Valve	EA	10	\$ 450.00	\$ 4,500.00
9	4" Gate Valve	EA	20	\$ 900.00	\$ 18,000.00
10	2" Flush Hydrant	EA	20	\$ 1,500.00	\$ 30,000.00
11	3/4" Single Meter	EA	97	\$ 1,800.00	\$ 174,600.00
12	3/4" HDPE Waterline	LF	4850	\$ 9.25	\$ 44,862.50
13	Road Crossing w/ Steel Sleeve	LF	50	\$ 100.00	\$ 5,000.00
	Subtotal				\$ 625,662.50
System 2					
14	32,000 On Grade, Welded Steel Reservoir	LS	1	\$ 48,000.00	\$ 48,000.00
15	Concrete Ringwall	LS	1	\$ 5,000.00	\$ 5,000.00
16	Site Grading	CY	2000	\$ 2.50	\$ 5,000.00
17	Natural Gravel Surfacing, 4" thick	SY	2000	\$ 7.00	\$ 14,000.00
18	Site Clearing and Grubbing	AC	1.00	\$ 1,500.00	\$ 1,500.00
19	4" Waterline Pipe including fittings	LF	12300	\$ 16.00	\$ 196,800.00
20	4" Gate Valve	EA	15	\$ 900.00	\$ 13,500.00
21	2" Flush Hydrant	EA	8	\$ 1,500.00	\$ 12,000.00
22	3/4" Single Meter	EA	52	\$ 1,800.00	\$ 93,600.00
23	3/4" HDPE Waterline	LF	2600	\$ 9.25	\$ 24,050.00
24	Road Crossing w/ Steel Sleeve	LF	50	\$ 100.00	\$ 5,000.00
25	Booster Station	LS	1	\$ 25,000.00	\$ 25,000.00
	Subtotal				\$ 443,450.00
Construction Activities					
26	Construction Staking	%		1.4%	\$ 14,967.58
27	Construction Surveying	%		1.3%	\$ 13,898.46
28	Construction Mobilization	%		4.0%	\$ 42,764.50
	Construction Contingency @ 10%				\$ 114,074.30
	TOTAL CONSTRUCTION COST				\$1,254,817.34
	NMGRT @ 7.3125%				\$ 91,758.52
	PROJECT TOTAL				\$ 1,346,575.86

This estimate of construction cost is only an opinion. Medina Consulting cannot and does not guarantee that proposals, bids, or actual Construction Costs will not vary from this opinion. These prices are based on tabulated bids for similar projects overseen by Medina Consulting, recorded prices for New Mexico Department of Transportation projects, and City of Albuquerque projects.

Note: Not all items listed in this opinion will be included in the Basic Distribution System Replacement Plan or the final design while additional items may have to be added.

TABLE 4: OPTION 1 COST SUMMARY	
TOTAL CONSTRUCTION COST	\$ 1,346,575.86
Engineering @ 7.5%	\$ 100,993.19
*Other Professional Services @ 3.5%	\$ 47,130.16
Legal Fees @ 0.75%	\$ 10,099.32
Inspection @ 4.5%	\$ 60,595.91
NMGRT @ 7.0%	\$ 15,317.30
PROJECT TOTAL	\$ 1,580,711.74
Annual Loan Payment (20-yr Term @ 3.0%)	\$105,199.11

*Other Professional Services include surveying, soils testing, etc.

2. Option 2 – Water System Rehabilitation as Public Entity

The probable construction cost estimates for Option 2 are shown in Table 3 & Table 5. These preliminary estimates are based on current material and labor costs realized by similar project improvements. Table 3 illustrates the probable construction costs associated with the selected improvements. Table 5 summarizes construction costs with the probable “soft costs”. The itemized costs for Option 2 are the same. The additional costs will be inquired with the additional professional services, such as a Preliminary Engineering Report and Environmental Assessment meeting state and federal requirements. In addition, the construction cost will be approximately 5.0% higher due to state and federal wage rate requirements.

TABLE 5: OPTION #2 COST SUMMARY	
Public Construction Process (5.0%)	\$ 1,346,575.86
TOTAL CONSTRUCTION COST	\$ 1,413,904.65
Preliminary Engineering Report	\$ 30,000.00
Environmental Assessment	\$ 25,000.00
Engineering @ 7.5%	\$ 106,042.85
Other Professional Services @ 3.5%	\$ 49,486.66
Legal Fees @ 0.75%	\$ 10,604.28
Inspection @ 4.5%	\$ 63,625.71
NMGRT @ 7.0%	\$ 19,933.17
PROJECT TOTAL	\$ 1,718,597.32
Annual Loan Payment (20-yr Term @ 3.0%)	\$114,375.63

*Other Professional Services include surveying, soils testing, etc.

The annual loan payments illustrated in Table 4 and Table 5 are based on typical loans offered by the New Mexico Environment Department Rural Infrastructure Program (RIP) and

the New Mexico Finance Authority. As a public entity, grant funding is available to those communities whose median household income is below \$31,526.

3. Recommendation

The cost to rehabilitate the Sierra Los Pinos water system is approximately 1.5 million dollars to 1.75 million dollars depending on the selected option. Utilizing the public option is beneficial when the median house household (MHI) is below \$31,526. Since both the Jemez Springs census tract MHI, Sandoval County MHI, and the Sierra Los Pinos subdivision MHI all exceed this threshold, there is no financial benefit to pursuing a public project as a MDWCA. All funding agencies utilize the MHI to determine potential grant funding availability. In addition, the public option typically requires 2 years until construction of water system improvements commences.

Therefore, Medina Consulting recommends establishing a monthly rate and/or annual assessments to finance the needed water system improvements in a phased approach. The phased approach would establish smaller projects around \$500,000 to rehabilitate the critical water system components first. The projects can also be financed through the NMED, NMFA, or USDA Rural Development. These smaller projects will also ease the construction feasibility given the extended winter conditions experienced in the Jemez Springs region. The phased approach will allow critical water system component to be replaced or rehabilitated this year (2011).