

TOWN OF CROWLEY
GREEN RESERVE BUSINESS CASE
WATER SYSTEM IMPROVEMENTS PROJECT

A. PURPOSE AND SCOPE

The Town of Crowley has provided central water service to its constituents since it was incorporated in 1921. Since this time, the town has undertaken significant water system improvement projects. In 1980, the town's distribution system was connected to the newly created County Regional Water System, which resulted in the town abandoning its water supply wells and storage tank. In 1982, a major distribution system replacement project was conducted by the town, which resulted in the installation of 9,900 feet of new 8-inch, 6-inch and 4-inch diameter piping. This was followed by an additional water system improvements project in 1994 which resulted in the replacement of approximately 8,100 feet of water mains with new polyvinylchloride (PVC) piping together with water service upgrades including the replacement of meters, meter pits and service lines. The copper service lines installed in 1994 extended from the main to the meter pit and did not contain curb stops.

Since these projects, the town has become painfully aware that the brass meter setters are corroding at the connection to the copper service lines. In addition, the copper service lines have been found to be corroding outside of the meter pits as well. All of this points to the area having aggressive soils to metal piping. In contrast, the 1982 water project incorporated HDPE service line piping. This has reportedly held up and is still in good condition. The leaks coming from the service line piping typically do not rise to the ground surface. This results in leaks going undetected for long periods or not being found at all. As such, the town is losing substantial amounts of water through these leaks.

Given the percentage of water lost, the town has two significant concerns. The first concern is the health and safety of the town's constituents. As a result of the high percentages of water loss connected to the leaking distribution system, there is the possibility for contamination entering the system. The second concern is the cost associated with purchasing the bulk water from the County. This lost water is not used by

the town water customers, but it still requires payment by the town to the County. All water metered at the master connection to the regional system is billed to the town. The monthly water loss in 2009 averaged over 495,000 gallons while in the first four months of 2010, the monthly average water loss was over 350,000 gallons. These losses are too high and unacceptable. The town's desire is to replace the water service lines in pursuing AWWA's goal of 10% or less in-system water losses. The water service lines installed in the 1994 project represent the biggest burden, health and safety concern and cost to the town.

B. BACKGROUND

As previously stated, the town's existing distribution system is in good condition with the exception being the water service lines. The water service lines were installed within two different projects using two different types of piping material. The service lines installed with HDPE pipe have proven to hold up over the years with only a small percentage becoming brittle and needing replacement. In contrast, the service line piping installed with copper tubing has proven to be very problematic. The soils within Crowley have proven to be aggressive to metal piping, which has resulted in numerous leaks and only a few of the leaks surfacing. As a result, the town is experience significant water loss and has to pay the County for all of the unused water.

Annual water losses in 2009 stood at 45% of the water purchased. In the first four months of 2010, they stood at 47%. The town's combined water loss for 2009 and the first four month of 2010 is calculated to be 7,340,000 gallons. The town is also incorporating the installation of new water meters on all of its customers services thereby eliminating errors in meter reading. Although the town has undertaken two significant water projects associated with the distribution system, there is still a slow, steady and constant increase in the water loss. This is largely attributed to the water service lines installed within the 1994 project, with a small portion associated with the 1982 project. The losses are predominately associated with the copper service line piping. These service lines are directly related to the distribution system's water losses. These segments of the water service lines have been programmed for replacement within the proposed project.

C. PROJECT

In order to address the water losses within the distribution system, the town has undertaken a Preliminary Engineering Report (PER) to evaluate the water system. Within the report, the recommendation was made to replace all of the water service lines installed within the 1994 project and replace any known problematic service lines installed in 1982. There are a total of 77 service lines that are programmed to be replaced within the project. This results in approximately 2,000 lineal feet of new water service line to be installed. All of the service lines will be installed using a composite tubing with a copper core encapsulated within HDPE. The lines will be replaced from the water main to inside the meter pit and connected the meter setter.

D. CONCLUSION

Given the high cost associated with water service line replacements, the town will focus its resources on replacing the water service lines starting with those associated with the 1994 project. Should there be enough funds to undertake additional service line replacements, then the problematic HDPE service lines will be replaced. This falls into alignment with what has been identified in the PER. The areas programmed for replacement have been noted as service lines installed in the 1994 water system improvement project. This approach will effectively eliminate the poorest quality water service line piping within the distribution system.

The proposed project has allocated \$70,700 specifically for the replacement of existing service line piping. Out of this amount, construction costs represent \$41,200 while the remaining funds are associated with soft costs and contingencies. This results in the replacement of approximately 2,000 lineal feet of water service line piping. Again, this represents the replacement of the worst service line material within the water system. Given the condition of the recently replaced segments within the town's distribution system, most, if not all, of the water loss is associated with the water service lines. Therefore, the presumption is made that the vast majority of the water loss is coming from the corroded copper service line material dating back to the 1994 water system improvements project. By replacing these service lines, the town is anticipating the water loss to drop from an average of 46% to between 10% to 15%. This represents a reduction

in water loss by over two thirds compared to the existing water loss. Having an average annual water loss of 5,505,000 gallons, the town is anticipating saving at least 3,670,000 gallons of water annually.

E. GREEN PROJECT RESERVE CATEGORY

By replacing the identified water service lines and their impact on water losses, the town requests the project be eligible and qualify for the Green Project Reserve Water Efficiency Section 2.5-2: Distribution pipe replacement or rehabilitation to reduce water loss and prevent water main breaks, as defined in the 2011 Clean Water and Drinking Water SRF 20% Green Project Reserve: Guidance for Determining Project Eligibility. This portion of the project represents \$70,700, which is contained within the total loan request of \$100,000.

TOWN OF CROWLEY
GREEN RESERVE BUSINESS CASE
WATER PRODUCTION vs. WATER BILLED
2009 WATER METER DATA

Month	Production, MG ¹⁾	Sales, MG ¹⁾	Water Loss	
			Gallons	Percentage
January	800,000	430,000	-370,000	-46%
February	760,000	400,000	-360,000	-47%
March	920,000	490,000	-430,000	-47%
April	910,000	490,000	-420,000	-46%
May	1,240,000	760,000	-480,000	-39%
June	1,590,000	1,030,000	-560,000	-35%
July	1,740,000	1,180,000	-560,000	-32%
August	1,710,000	1,120,000	-590,000	-35%
September	1,320,000	780,000	-540,000	-41%
October	940,000	420,000	-520,000	-55%
November	1,000,000	460,000	-540,000	-54%
December	980,000	410,000	-570,000	-58%
Totals	13,90,000	7,970,000	-5,940,000	
Average Annual Water Loss				-45%

2010 WATER METER DATA

Month	Production, MG ¹⁾	Sales, MG ¹⁾	Water Loss	
			Gallons	Percentage
January	910,000	360,000	-550,000	-60%
February	860,000	320,000	-540,000	-63%
March	650,000	400,000	-250,000	-38%
April	540,000	480,000	-60,000	-11%
Totals	2,960,000	1,560,000	-1,400,000	
Average Annual Water Loss				-47%

TOWN OF CROWLEY
WATER SYSTEM IMPROVEMENTS
TOWN OF CROWLEY

Item	Description	Quantity	Unit Cost	Total Cost
1.	Service Vault including 6" turbine meter with remote read, 6" pressure reducing valve with low flow bypass, bypass piping, valves, and concrete vault.	1	LS 24,000	24,000
2.	Fire hydrants including connection to existing main, 6" lateral, lateral valve, and surface restoration			
	a. County Lane 11.5, 1,300 feet north of County Road E.5	1	EA 3,900	3,900
	b. County Lane 11.5, 650 feet north of County Road E.5	1	EA 3,900	3,900
	c. County Road E.5, 600 feet east of County Lane 11.5	1	EA 3,900	3,900
	d. Market and A Streets, northeast corner	1	EA 3,900	3,900
	e. Main and Fifth Streets, northwest corner	1	EA 4,400	4,400
	f. Main and Seventh Streets, northeast corner	1	EA 4,400	4,400
3.	New service lines with 3/4" composite tubing, meter setter and reinstall existing meter	77	EA 500	38,500
	a. Pavement replacement, 3' x 12' average	60	SY 45	2,700
4.	New 1½" service meters with meter pit and meter setter	2	EA 1,200	2,400
5.	Replace existing meters with Priority One service line replacements with radio read meters	77	EA 230	17,710
6.	Replace remaining existing meters with radio read meter including new meter setter, and service line	30	EA 730	21,900
7.	Replace existing fiberglass meter pits with the installation of the new meters and meter setters (Item 6)	30	EA 375	11,250
8.	Radio meter reading system, including hand held unit, software and training	1	LS 12,000	12,000
9.	Davis-Bacon wage increase in cost of labor	1	LS 20,000	20,000
Subtotal Preliminary Cost for Water System Improvements				\$174,860
Project Contingencies				\$23,140
Engineering Related				
1.	Design/Contract Administration			\$32,000
2.	Construction Observation (60 days full and part time)			\$20,000
3.	Other Engineering			\$40,000
4.	Administrative Costs			\$10,000
Total Construction Cost Estimate				\$300,000

TOWN OF CROWLEY
GREEN COMPONENTS FOR THE WATER SERVICE LINE REPLACEMENT FOR THE
WATER SYSTEM IMPROVEMENTS PROJECT

Total Construction Cost				\$174,860
Green Business Case Components - Water Service Lines				
3.	existing meter	77	EA 500	38,500
	a. Pavement replacement, 3' x 12' average	60	SY 45	2,700
Water Service Line Cost				41,200
Percentage Green Represents of Construction Costs				23.6%
Soft Cost Associated with Green Components (23.6% x soft cost component)				
1.	Project Contingencies			\$5,452
2.	Design/Contract Administration			\$7,540
3.	Construction Observation (60 days full and part time)			\$4,712
4.	Other Engineering			\$9,425
5.	Administrative Costs			\$2,356
Total Cost for Water Service Line Green Component				\$70,685
Total Green Business Case Components Cost - Water Service Lines				\$70,700

Item	Description	Quantity	Unit Cost	Total Cost
Green Categorical Components - Water Meters				
1.	Service Vault including 6" turbine meter with remote read, 6" pressure reducing valve with low flow bypass, bypass piping, valves, and concrete vault.	1	LS 24,000	24,000
2.	New 1½" service meters with meter pit and meter setter	2	EA 1,200	2,400
3.	read meters	77	EA 230	17,710
4.	setter, and service line	30	EA 730	21,900
5.	and meter setters (Item 6)	30	EA 375	11,250
6.	Radio meter reading system, including hand held unit, software and training	1	LS 12,000	12,000
7.	Davis-Bacon wage increase in cost of labor	1	LS 20,000	20,000
Water Meter Cost				109,260
Percentage Green Represents of Construction Costs				62.5%
Soft Cost Associated with Green Components (62.5% x soft cost component)				
1.	Soft Cost Associated with Green Components (23.6% x soft cost component)			\$14,459
2.	Design/Contract Administration			\$19,995
3.	Construction Observation (60 days full and part time)			\$12,497
4.	Other Engineering			\$24,994
5.	Administrative Costs			\$6,248
Total Cost for Water Service Line Green Component				\$187,453
Total Green Categorical Cost - Water Meters				\$187,500
Total Green Component Costs				\$258,200