Attachment B

Summary Report on Water Distribution System Needs and Recommended Improvements for County Service Area 10A (Cayucos, CA)

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Cayucos, CSA 10A – Summary Report on Water Distribution System Needs and Recommended Improvements

Purpose

The purpose of this report is to summarize recent analysis of the County Service Area (CSA) 10A Water Distribution System (Water System), identify priority Water System needs and recommend Water System Improvements

Background

CSA 10A is located in south Cayucos and has 753 service connections (2007 Water Management Plan Update, Cayucos Area Water Organization). The Water System consists of one 210,000 gallon water storage tank, approximately 30,000 linear feet (LF) of waterline, 46 fire hydrants, and 18 wharfheads.

The source of water for the Water System is Whale Rock Reservoir, east of Cayucos. Raw water from Whale Rock is treated at the Cayucos Water Treatment plant and directed into the 240,000 gallon Clearwell Tank, before being pumped into the 10A Water System.

An analysis was recently performed on the Water System that included the creation of a hydraulic model to analyze the system's existing storage, capacity, and condition. Results of this analysis are discussed herein.

Water System Storage

The CSA 10A Water System, at build out, requires a total water storage capacity of 486,000 gallons. American Water Works Association (AWWA) is the water industry's leading professional organization, and AWWA Standards requires that water storage capacity is based on the addition of the following three water demands:

- Equalization Storage - Equalization storage is required to meet daily water system demands in excess of delivery capability. At build-out, the equalization storage component is 77,800 gallons.
- Fire Storage – Fire storage is required to meet requirements of the Insurance Services Office (ISO) and the California Fire Code (CFC). Fire storage is 1,000 gallons per minute (gpm) for 2 hours at 20 psi, for residential properties, or 120,000 gallons.
- Emergency Storage – Emergency storage provides water during emergency situations, such as pipeline failures, major trunk main failures, equipment failures, electrical-power outages, water treatment facility failures, raw-water supply contamination, or natural disasters. The emergency storage for CSA 10A is 289,000 gallons (1,927 capita at build-out, 50 gallons per person for 3 days).

Currently, the 10A Water System storage consists of a total of 287,000 gallons; 210,000 gallons in the existing 10A Water Storage Tank and 77,000 gallons in the Clearwell Tank at the

Cayucos Water Treatment Plant.

The Water System storage is currently deficient by approximately 200,000 gallons. The construction of a new 200,000 gallon water storage tank is necessary in order for the Water System to meet the required equalization, emergency and fire storage.

Water System Capacity

As part of the Water System analysis, Utilities Engineering staff created a WaterCAD hydraulic model to analyze the Water System capacity in detail. Fire flow required to meet CFC and ISO standards is 1,000 gpm. The model revealed that the existing Water System does not meet these minimum flow requirements.

The WaterCAD model was also utilized to identify minimum improvements necessary to supply the residents of CSA 10A with flows able to meet CFC fire flow requirements. These improvements consist of upsizing selected sections of substandard, undersized 4-inch waterline, totaling approximately 4,075 linear feet, to 8-inch PVC

Water System Operation and Maintenance Needs

The Water System analysis also included identification of facilities in need of repair and/or replacement. Facilities considered in need of repair or replacement include those which physically exhibit deterioration, experience leaks, require excessive maintenance or are beyond their useful life. The analysis revealed the following deficiencies:

- Approximately 23,213 LF of waterline is constructed of asbestos-cement pipe and is beyond its useful life and must be replaced.
- 5,175 LF of pipe is substandard 4-inch pipe and must be replaced.
- Of the 64 hydrants in the Water System, 18 are 4-inch wharfheads, which do not meet CFC required standards and need to be replaced.
- Approximately 20 of the remaining hydrants do not have shutoff valves and are in need of replacement as well.

The existing CSA 10A tank was inspected in 2007 and found to be in need of both interior and exterior coating. The exterior of the tank was recoated in 2009; however, due to the substantial cost for necessary temporary tanks, the coating of the interior was postponed. To keep the existing CSA 10A water storage tank in operable condition, the interior must be recoated and the tank's roof needs to be replaced due to excessive corrosion. It is recommended that the tank be recoated and maintained on a regular basis as determined by inspections conducted every 3 to 5 years to prevent corrosion and the need for additional repair.

Water System Improvements Recommendations

Based on the information presented above, the following is recommended to meet the priority Water System needs:

- Upgrade select waterlines to meet minimum residential flow requirements.
- Recoat the interior and replace the roof of the existing 210,000 gallon CSA10A water storage tank
- Install a new 200,000 gallon water storage tank to meet AWWA and CFC storage requirements
- Establish a Water System maintenance and replacement plan to upgrade all existing 4-in. and asbestos-cement waterlines; replace all wharfheads and valveless fire hydrants with standard, valved fire hydrants; recoat and rehabilitate existing water storage tank at scheduled intervals; and replace existing tank in approximately 24 years.

These recommendations are further described below and are grouped in a manner that accounts for priority and timing constraints.

Waterline Upgrade and Existing Tank Rehabilitation

To meet required fire flow standards and address the most deteriorated facilities in the Water System, two improvement projects have been identified. The first project includes upgrading approximately 4,075 linear feet of the Water System's 4-in. waterlines to 8-in. PVC pipe. The second project consists of replacing the existing 210,000 gallon CSA 10A tank's roof and recoating its interior. Categorical exemptions have been completed for both of these projects and project implementation could begin immediately. The cost for these projects is estimated to be $1,621,000. See Attachment A for Cost Estimate.

New Water Storage Tank

To meet the AWWA and California Fire Code Standards for water storage, a new 200,000 gallon water storage tank must be constructed in the Water System. This tank will provide the required equalization, fire and emergency water storage needed by the community. A Tank Siting Study has identified several potential sites for a new tank.

Neither the CEQA process nor Coastal Commission approval for this project has been completed or granted. It is anticipated that this process will take two years. A significant consideration in determining this project's final scope and schedule will be Coastal Commission approval of a tank site. The cost of this project is estimated to be $1,100,000. See Attachment B for Cost Estimate.

Infrastructure Repair and Replacement Program

In addition to the upsizing of existing waterlines, the rehabilitation of the existing tank and the construction of a new water storage tank, it is necessary to repair and replace the existing Water System's aging facilities on a regular basis to prolong the life of the System. An Infrastructure Repair and Replacement Program has been identified to accomplish these goals. The program would include upgrading approximately 1,100 LF of existing 4-in. waterline, replacing approximately 23,213 LF of aged asbestos-cement pipeline, replacing all wharfheads and valveless fire hydrants with standard, valved fire hydrants, recoating and rehabilitating the existing water storage tank at scheduled intervals and replacing the existing tank in

approximately 24 years. This program would provide for this repair and replacement over the next 40 years at an estimated annual cost of $308,658. See Attachment C for Cost Estimate.

Attachments:

Attachment A – Waterline Upgrade and Existing Tank Rehabilitation – Engineer's Cost Estimate and Description of Cost Items

Attachment B – New Water Storage Tank – Engineer's Cost Estimate and Description of Cost Items

Attachment C – Infrastructure Repair and Replacement Program – Engineer's Cost Estimate and Description of Cost Items

Attachment A

Waterline Upgrade and Existing Tank Rehabilitation - Engineer's Cost Estimate

ITEM NO.	ITEM	COST
PRELIMINARY ENGINEERING, DESIGN, ENVIRONMENTAL & RIGHT OF WAY COSTS		
1	Tank Siting Study	$70,000
2	Water System Modeling and Analysis	$92,000
3	Geologic Feasibility Study	$15,000
4	Fire Flow Test	$5,000
5	County Staff Support/Coordination	$80,000
6	Right of Way	$20,000
7	Environmental Permitting	$15,000
8	Waterline Design	$132,000
9	Tank Design	$70,000
Total Preliminary Costs		**$499,000**
CONSTRUCTION CONTRACT COSTS		
	WATERLINE IMPROVEMENTS	
10	Mobilization	$15,000
11	8" PVC Pipeline	$356,000
12	Fire Hydrants	$45,000
13	Contingency (20%)	$84,000
	TANK REHABILITATION	
14	Mobilization	$15,000
15	Temporary Tanks	$90,000
16	Interior Coating of Tank	$100,000
17	New Tank Roof	$50,000
18	Contingency (20%)	$51,000
Total Construction Contract Costs		**$806,000**
CONSTRUCTION SUPPORT COSTS		
19	Waterline Construction Management	$113,000
20	County Staff Support/Coordination	$30,000
21	Tank Rehab Construction Management	$78,000
22	County Staff Support/Coordination	$20,000
Total Construction Support Costs		**$241,000**
USDA FUNDING APPLICATION COSTS		
23	USDA Engineer's Report	$30,000
24	Bond Counsel	$25,000
25	Other Financial and Legal Costs	$20,000
Total USDA Funding Application Costs		**$75,000**
GRAND TOTAL		**$1,621,000**

Waterline Upgrade and Existing Tank Rehabilitation - Description of Cost Items

PRELIMINARY ENGINEERING, DESIGN, ENVIRONMENTAL & RIGHT OF WAY COSTS

1. Siting Study – A detailed study to identify and evaluate potential new water storage tank sites for Water System modeling. The Study is needed to identify specific Water System piping upgrades required to meet CFC flow requirements.
2. Water System Modeling and Analysis – A WaterCAD hydraulic model was created to evaluate existing and future Water System storage and flow capacity, and identify necessary upgrades.
3. Geologic Feasibility Study – A study to determine the stability and feasibility of potential Tank Sites.
4. Fire Flow Test – A physical flow test was conducted within the Water System, using 25% of the System's hydrants to identify flow throughout the System. This test is necessary to confirm and to calibrate the Water System hydraulic model
5. County Staff Support/Coordination – Staff time associated with Siting Study, modeling and associated preliminary engineering. Estimate based on recent County projects.
6. Right of Way – Estimated cost for County Right of Way staff to assess and/or procure necessary easements for construction of pipeline upgrades. Estimate based on recent projects.
7. Environmental Permitting – Estimated cost for County staff to acquire the necessary environmental permits. Estimate based on recent projects.
8. Waterline Design – Includes engineering, design and project management involved with developing a set of plans, specifications and estimate suitable for bidding. Estimate based on recent projects.
9. Tank Design – Includes engineering, design and some project management involved with developing a set of plans, specifications and estimate suitable for bidding on tank rehabilitation. Estimate based on recent projects.

CONSTRUCTION CONTRACT COSTS

WATERLINE IMPROVEMENTS

10. Mobilization – Estimated construction cost for Contractor to mobilize equipment on site. Estimate based on recent projects.
11. 8" PVC Pipeline – Cost estimate base on similar, recent County contracts ($96/LF).
12. Fire Hydrants – Cost estimate based on recent projects ($5,000/hydrant).
13. Contingency (20%) – Standard contingency for construction contracts. Estimate based on recent projects.

TANK REHABILITATION

14. Mobilization – Estimated construction cost for Contractor to mobilize equipment on site. Estimate based on recent projects.
15. Temporary Tanks – Estimated cost to set up temporary tanks necessary for storage while existing tank is out of service for interior recoating. Includes substantial cost for grading. Estimate based on recent projects.
16. Interior Coating of Tank – Cost estimate based on similar, recent County tank recoating contracts.
17. New Tank Roof – Cost estimate based on contractor quotes.
18. Contingency (20%) - Standard contingency for construction contracts.

CONSTRUCTION SUPPORT COSTS

19. Waterline Construction Management – Estimated cost for resident engineer and operators to administer construction contract. Estimate based on recent projects.

20. County Staff Support/Coordination – Estimated cost for project manager and other County staff to support and coordinate construction contract. Estimate based on recent projects.
21. Tank Rehab Construction Management - Estimated cost for resident engineer and operators to administer construction contracts. Estimate based on recent projects.
22. County Staff Support/Coordination - Estimated cost for project manager and other County staff to support and coordinate construction contract. Estimate based on recent projects.

USDA FUNDING APPLICATION COSTS

23. USDA Engineer's Report – Cost based on estimate from USDA.
24. Bond Counsel – Cost based on recent cost for similar Santa Margarita USDA loan application.
25. Other Financial and Legal Costs – Estimated cost for Tax Treasurer, County Counsel, County Clerk and other support staff.

Attachment B

New Water Storage Tank - Engineer's Cost Estimate

ITEM NO.	ITEM	COST
PRELIMINARY ENGINEERING AND ENVIRONMENTAL COSTS, 2 YEARS		
26	County Staff Support/Coordination	$20,000
27	Environmental Permitting	$100,000
Total Preliminary Costs		**$120,000**
ENGINEERING, DESIGN, AND RIGHT OF WAY COSTS		
28	County Staff Support/Coordination	$4,000
29	Right of Way	$422,000
30	Tank Design	$129,000
Total Preliminary Costs		**$555,000**
CONSTRUCTION CONTRACT COSTS		
31	Mobilization	$20,000
32	8" PVC Pipeline	$36,000
33	200,000 gallon Tank	$174,000
34	Contingency (20%)	$46,000
Total Construction Contract Costs		**$276,000**
CONSTRUCTION SUPPORT COSTS		
35	Construction Management	$86,000
36	County Staff Support/Coordination	$28,000
Total Construction Support Costs		**$114,000**
USDA FUNDING APPLICATION COSTS		
37	USDA Engineer's Report	$5,000
38	Bond Counsel	$25,000
39	Other Financial and Legal Costs	$5,000
Total USDA Funding Application Costs		**$35,000**
GRAND TOTAL		**$1,100,000**

New Water Storage Tank - Description of Cost Items

PRELIMINARY ENGINEERING AND ENVIRONMENTAL COSTS, 2 YEARS

26. County Staff Support/Coordination - Staff time associated with Siting Study and associated preliminary engineering. Estimate based on recent projects.
27. Environmental Permitting - Estimated cost for County staff to acquire the necessary environmental permits. Estimate based on recent projects.

ENGINEERING, DESIGN, AND RIGHT OF WAY COSTS

28. County Staff Support/Coordination - Estimated cost for project manager and other County staff to support and coordinate project. Estimate based on recent projects.
29. Right of Way - Estimated cost for County Right of Way staff to assess and/or procure necessary property and easements for construction of new water storage tank. Estimate based on preliminary staff appraisals.
30. Tank Design - Includes engineering, design and some project management involved with developing a set of plans, specifications and estimate suitable for bidding on tank construction. Estimate based on recent projects.

CONSTRUCTION CONTRACT COSTS

31. Mobilization - Estimated construction cost for Contractor to mobilize equipment on site. Estimate based on recent contracts.
32. 8" PVC Pipeline - Cost estimate base on similar, recent County contracts ($96/LF).
33. 200,000 gallon Tank - Cost estimate base on similar, recent County contracts.
34. Contingency (20%) - Standard contingency for construction contracts.

CONSTRUCTION SUPPORT COSTS

35. Construction Management - Estimated cost for resident engineer and operators to administer construction contracts. Based on recent contracts.
36. County Staff Support/Coordination - Estimated cost for project manager and other County staff to support and coordinate construction contract. Estimate based on recent projects.

USDA FUNDING APPLICATION COSTS

37. USDA Engineer's Report – Cost based on estimate from USDA.
38. Bond Counsel – Cost based on recent cost for similar Santa Margarita USDA loan application.
39. Other Financial and Legal Costs – Estimated cost for Tax Treasurer, County Counsel, County Clerk and other support staff.

Attachment C

Estimate of Costs
INFRASTRUCTURE REAIR AND REPLACEMENT PROGRAM COSTS

An engineer's estimate of probable cost of the proposed improvements is shown in "Table 1 – Engineer's Cost Estimate".

Table 1
Engineer's Cost Estimate

CSA 10A Infrastructure Maintenance Projects	Replacement Schedule[2]						Annual Revenue Need[3]
	8 yrs	16 yrs	24 yrs	32 yrs	40 yrs	Total	
Existing Tank Recoating [1]	$ 314,159	$ 397,967	$ -	$ 638,621	$ 808,985	$ 2,159,732	**$ 47,969**
Upsize 4" substandard Pipeline	$ 139,345	$ 176,518	$ -	$ -	$ -	$ 315,862	**$ 8,785**
Replace AC Pipeline	$ 1,176,221	$ 1,490,002	$ 1,887,490	$ 2,391,016	$ 3,028,867	$ 9,973,597	**$ 223,734**
Replace Hydrants/Wharf Heads	$ 48,137	$ 60,979	$ 77,246	$ 97,853	$ 123,957	$ 408,173	**$ 9,156**
Replace Existing Tank	$ -	$ -	$ 813,118	$ -	$ -	$ 813,118	**$ 19,014**
Total	$ 1,677,862	$ 2,125,466	$ 2,777,854	$ 3,127,490	$ 3,961,810	$ 13,670,482	**$ 308,658**

[1] Includes Temporary Tank Costs

[2] Assumed Inflation Rate = 3%

[3] Assumed Interest Earned = 1.5%

Infrastructure Repair and Replacement Program - Description of Cost Items

- Existing Tank Recoating – Cost to recoat the interior of the existing CSA 10A Water Storage Tank. Estimate based on recent, similar recoating contract costs
- Upsize 4-in. Substandard Pipeline – Cost to replace substandard 4-inch waterline with 8-inch PVC waterline. Estimate based on recent, similar pipeline project costs
- Replace AC Pipeline - Cost to replace substandard asbestos-cement pipeline with 8-inch PVC waterline Estimate based on recent, similar pipeline project costs
- Replace Hydrants/Wharf Heads – Cost to replace substandard, valveless hydrants and 4-inch wharfheads with standard fire hydrants. Estimate based on recent, similar project costs
- Replace Existing Tank – Cost to replace existing 200,000 gallon CSA 10A Water Storage Tank with the same sized tank, after 24 years. Estimate based on current tank construction cost quotes