Report

City of Woodland and Yolo County Service Areas Water and Wastewater Regionalization Feasibility Study

Prepared for

City of Woodland

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Section 1

Introduction

The City of Woodland (City) and Yolo County (County) have commissioned this study to evaluate the feasibility of regionalizing water and wastewater systems in Yolo County. The study is intended to be an initial scoping document to outline the various issues and opportunities expected if the various water and wastewater systems were combined and operated by the City of Woodland.

The County operates several Community Service Areas (CSAs) and Community Service Districts (CSDs) in the vicinity of Woodland and Davis. The CSAs and CSDs provide for water service, sewer service and sometimes other services such as community street lighting. The communities considered in this evaluation include:

- Esparto CSD
- Madison CSD
- Wildwings CSA
- North Davis Meadows CSA
- Binning Tract (not currently a CSA but operated by the County)
- Willowbank
- Knights Landing CSD
- West Kentucky (not a CSA)

The potable water systems are generally comprised of wells, pumps, tanks, and a water distribution system. Wastewater systems generally include sewers, pump stations, aerated lagoons , and seasonal disposal (percolation and evaporation) of the treated wastewater. In the case of Wildwings, the community owns and operates a tertiary wastewater treatment plant and the water is used to irrigate the golf course. The operation, maintenance, and administration of these smaller facilities are expensive compared to larger treatment facilities. Many of these communities have experienced significant increases in their water and sewer service fees. Some communities have elevated nitrate and arsenic levels in the wells. Some communities lack redundant wells and cannot meet specified fire flow demands.

The City owns and operates sewers, pump stations, and a Water Pollution Control Facility (WPCF). The WPCF provides year–round tertiary treatment and discharge to a nearby agricultural canal. The plant is currently being upgraded and will have excess capacity to handle flows beyond that generated by full development of its General Plan. The City's potable water system is a series of wells, tanks, and a water distribution system. The City is currently developing a new surface water supply with the City of Davis which will involve a new water

treatment plant and construction of new water transmission mains. While both the City's wastewater and proposed water systems provide a higher level of service than many of the CSAs/CDAs, the City's monthly sewer rates (a combination of operating costs and debt service from capital projects) are lower than these areas due to the economies of scale and efficiencies gained from operating a significantly larger system (on the order of 20,000 EDUs exist within the City compared to several hundred units in each of the individual communities).

Section 2

Study Methodology

This report is intended to be initial scoping document to outline the various issues and opportunities expected if Woodland were to operate, maintain, and, if necessary, construct of regional water and sewer facilities.

The study uses a "triple bottom line methodology" for evaluating and describing the alternatives where economic, social, environmental concerns must all be satisfied for all parties (in this case the County, the CSAs/ CSDs, and the City). This approach is commonly used in business case evaluations (sometimes referred to "people, planet, profit" or the "balanced scorecard") and is considered a metric for whether the solution is both comprehensive and sustainable. Potential economic, social, and environmental drivers and concerns might include the following list:

Economic Drivers/ Concerns

- What are the order of magnitude estimate upfront capital costs and expected operation and maintenance (O&M) costs.
- What are the monthly sewer service charges for wastewater conveyance, treatment, and disposal for each community.
- What are the costs and benefits to Woodland from handling these systems.
- Are low interest or zero interest financing available for low income area and regional sewer or water projects.

Social Drivers and Concerns

- Are there local impacts such as odor generation, pipeline construction impacts, potential for growth inducement from regional facilities.
- Concerns of local control versus being a customer to Woodland.
- Do water rights issues exist.

Environmental Drivers and Concerns

- Future regulatory risks.
- Beneficial use of recycled water versus effluent disposal.
- Expected salinity impacts and possible mitigations.
- Condition of existing facilities and impacts of failure.

Some of these issues cannot be addressed within the context of this initial study but are intended to provide context for further study if desired by the City or County.

The study is organized into the following general sections:

- Description of each water and wastewater system, current fees, and known issues that might impact future water and wastewater system operations and costs.

- Development of a possible concept for how some or all of the systems might be regionalized into Woodland based on initial conversations with County and City Staff. Order of magnitude costs for regional facilities are also provided.

- Report Findings.

Section 3

Description of Yolo County Water and Sewer Systems

Table 1 provides information on each of the community water and wastewater systems. The data was provided by County staff, previous reports, and, in some cases, phone conversations from operators of the CSDs. Figure 1 shows a map of locations of each of these service areas and the cities of Woodland and Davis.

Common issues with each of the smaller systems include:

- Concerns with poor quality potable water. Groundwater in Yolo County can have elevated levels of nitrates and/ or arsenic. Poor quality groundwater is one of the drivers for the cities of Davis and Woodland to pursue a new surface water supply.

- Inability to meet minimum fire flow pressure and flowrates due to a combination of smaller pipes and inadequate storage and pumping.

- With the exception of the Wildwings CSA, each of the areas utilizes aerated ponds for secondary treatment followed by percolation and evaporation ponds. The Regional Water Quality Control Board has increased monitoring and regulation of groundwater salinity, nitrates, and other pollutants making operation of these systems more expensive and system expansion more difficult. Wildwings provides a tertiary level treatment consistent with reuse of the water on the golf course. The higher operating costs of these facilities (Grade IV certified operator(s), additional power, chemicals, and monitoring requirements) over a relatively small rate base is reflected in their current monthly fees-currently $104 for water, $124 for water.

- Limited reserves within each CSA make it difficult to complete condition assessments, preventative maintenance, and development of an on-going capital replacement fund. As a result, the systems tend to be operated until failure. Many of the communities do not have functioning Sewer System Management Plans (SSMPs). SSMPs are required by the State to demonstrate the system has adequate capacity and are being maintained to minimize overflows and system failures.

Section 4

Regional Water and Sewer System Concepts

Two workshops were held with staff from the County and City to discuss what a regional wastewater and/or water system might look like. The following was discussed:

The City of Woodland has available resources (staff, an organizational structure, equipment, etc) that could be leveraged related to the planning, construction, operation, maintenance, and operation of an expanded regional system.

The group discussed that to take advantage of economies of scale and operational efficiencies that the City would want to operate and maintain both the water and sewer systems of each community

The communities near or within the City of Davis service area (El Macero, Binning Tract, North Davis Meadows, Willowbank) are less likely to connect into Woodland given their locations and the fact that some of the communities already connect to the City of Davis for water and/ or sewer service.

Regionalizing sewer service is more straightforward than regionalizing water service due to the planned water supply project. The City does not have surface water rights to extend to these communities. As a result, the communities would likely have to continue to use groundwater. This may be a concern for the City since the wastewater from the outside areas would contain elevated TDS compared to the wastewater generated within the City Limits that will originate from the less saline Sacramento River.

One regional conveyance pipeline route along CR 24 would serve Wildwings, Madison, and Esparto. One regional pipeline route along CR 102 would serve Knights Landing.

The regional sewer concept would likely include 1) a new sewer pump station at each WWTP, 2) ability to direct peak flows into the existing treatment ponds, and 3) a small diameter (6 or 8 inch diameter) forcemain connection into the City's sewer.

The regional water concepts could include several options including 1) no changes to the existing system but facilities operated and maintained by Woodland, 2) interconnection of piping between Madison/ Esparto and possibly Wildwings for improved redundancy, and 3) interconnection of piping and an intertie to Woodland's water system for infrequent use. If arsenic, nitrate, or

salinity reduction was required in the future, wellhead treatment could be added and the brine could be directed to the abandoned wastewater ponds and/or regional sewer system.

PRELIMINARY FINANCIAL ANALYSIS

Order of magnitude costs and monthly sewer rate impacts have been developed for abandoning the individual wastewater treatment plants along CR 24 (Esparto, Madison, and Wildwings) as well as a separate connection from Knights Landing along CR 102.

FINANCING OPTIONS

The State Water Resources Control Board Division of Financial Assistance administers the State Revolving Fund (SRF) program. SRF provides loans and grants to fund construction of sewer and water reclamation systems. Low interest loans are available to qualified regional sewer projects. Grant and loan combinations are also available for small disadvantaged communities (DAC). In certain circumstances, the State has agreed to refinancing of existing debt to make the project more affordable to the community.

For the purposes of this study two financing scenarios have been developed:

1) The projects could be financed with an SRF loan- currently at 1.9 percent interest, 30 – year term. The State will extend financing terms from 20 to 30 years for projects that regionalize wastewater systems.
2) The projects are funded by an SRF loan and grant combination assuming Madison and Knights Landing qualify under the State's Category 1 DAC criteria. The DAC program allows for principal forgiveness (zero interest) loans and in certain circumstances will provide up to $4 million in grants for each DAC community served. The same low interest loan (1.9 percent interest, 30-year terms) would apply for the loan portion. Since the statewide funding needs for DAC exceed the available DAC grant funds, this report has assumed only the zero percent interest terms are available.

In either case, SRF has indicated that Woodland could finance the loan as long as there were repayment agreements in place between the CSAs and the City for the duration of the loan term.

ORDER OF MAGNITUDE COSTS

The following order of magnitude costs have been developed related to combining the sewer systems:

- A new sewer pump station constructed would be constructed at each community WWTP. Based on recent bids of this size, a submersible duplex (one duty, one standby pump) station, emergency generator, and small control building, would cost about $400,000.

- Construction of a 6-inch forcemain into the City of Woodland's sewer system. If constructed along County Roads, the pipeline is estimated to cost $78 per foot to construct.

The City's WPCF has adequate capacity to include these developments, but the City would need to charge the communities the connection fee it charges new homes and businesses to buy into the system. This fee is currently about $5,700 per single family house.

With these assumptions, and allowances for contingencies, planning, design and construction oversight, the following capital costs for new regional facilities have been developed:

- Regional sewer system along CR 24 serving Esparto, Madison, and Wildwings - $15,000,000 capital cost.
- Regional sewer system along CR 24 serving only Wildwings – $4,200,000 capital cost.
- Regional sewer system along CR 102 serving Knights Landing - $5,700,000 capital cost.

EXPECTED SEWER RATE IMPACTS

Sewer rates are a combination of ongoing O&M costs, operating reserves, and annual debt service payments for required improvements (described above). Table 1 provides a perspective on the rates for connecting sewers into the system.

Table 2
Possible Sewer Rate ($ / month / single family home) Implications of Connecting County CSAs and CSDs into Woodland

Regional Sewer Configuration	Units Served	Debt Service on 1.9 % SRF Loan	Debt Service on 0% SRF Loan (1)	Woodland O&M Fee (2)	Total Expected Monthly Fee (3)
Esparto- Madison – Wildwings	1547	$40	$30	$45	$75 – $85
Wildwings Only	337	$50	NA	$45	$95
Knights Landing	317	$73	$55	$45	$100 - $130

(1) Assumes Madison and Knights Landing meet the Disadvantaged Communities criteria.

(2) Approximate O&M fee per EDU in Woodland.

(3) Does not include any existing debt service that may exist in the CSAs and CSDs

The estimates in Table 1 represent sewer rates only. Water rates might be comparable to current rates if no significant upgrades are needed. It is interesting to note that the possible rates of Esparto- Madison-Wildwings $75-$85 per month are more than the current rates of Esparto ($53) and less than the current rates of Wildwings ($104). Knights Landing's higher rates reflect the costs of larger pipeline distance and the relatively small rate base to distribute those costs across.

Section 5

Study Findings

Regionalization of sewer and water systems from several of the CSAs and CSDs in the vicinity of Woodland appears technically feasible. This initial study is intended to identify and describe the various issues so stakeholders- the City of Woodland, the County, and the communities themselves- can make informed decisions going forward. Esparto, Madison, Wildwings, Knights Landing, and Woodland are discussed below in the context of the various social, environmental, and financial issues and benefits.

Esparto and Madison CSD		
	Benefits of Regionalization	**Issues with Regionalization**
Social	• Potential for connecting the two water systems together to improve system redundancy and meet fire flow demands.	• These communities would become a customer of the City of Woodland. The City would want to operate the systems at a similar level of service as the City's system. (This could also be considered a benefit of regionalization). • The communities' future growth plans would need to be coordinated with the City of Woodland.
Environmental	• Current or future issues with groundwater degradation at the pond treatment systems would be eliminated. • With a larger utility's resources, there would be a reduced chance for sewer overflows and system failures.	• No significant environmental issues are apparent.
Financial (Sewer)	• O&M costs per household would decrease by about $10 per month if connected to Woodland. • Future O&M rate increases tempered by the larger rate base with Woodland included. • Madison meets the State's DAC criteria. As a result, grants may be available so that their rates are no more than 2 percent of the median household income.	• Preliminary rate analysis suggests the debt service of regional pipeline construction might represent 30 to 40 dollars per month per household, almost doubling current sewer rates.

Wildwings CSA		
	Benefits of Regionalization	**Issues with Regionalization**
Social	• Potential for connecting the two water systems together to improve redundancy and meet fire flows and pressures.	• The community would become a customer of the City of Woodland. The City would want to operate the system at a similar level of service as the City's system. (This could also be considered a benefit of regionalization.)
Environmental	• Current or future issues with groundwater degradation at the pond treatment systems would be eliminated. • With a larger utility's resources, there would be a reduced chance for sewer overflows and system failures.	• Currently the treated wastewater provides a portion of the irrigation water for the golf course. If regionalized, additional groundwater would need to be pumped to replace this water.
Financial (Sewer)	• Preliminary rate analysis suggests sewer rates could be reduced by $10 to $30 per month per household depending on the financing terms and whether Esparto and Madison were also included. • Future rate O&M increases tempered by a larger rate base with Woodland included.	No significant financial issues are apparent.

Knights Landing CSD		
	Benefits of Regionalization	**Issues with Regionalization**
Social	• None apparent.	• The community would become a customer of the City of Woodland. The City would want to operate the systems at a similar level of service as the City's system. (This could also be considered a benefit of regionalization.) • The community's future growth plans would need to be coordinated with the City of Woodland.
Environmental	• Current or future issues with groundwater degradation at the pond treatment systems would be eliminated. • With a larger utility's resources, there would be a reduced chance for sewer overflows and system failures.	• No significant environmental issues are apparent.
Financial (Sewer)	• Future O&M rate increases tempered by the larger rate base with Woodland included. • Knights Landing meets the State's DAC criteria. As a result, grants may be available to further reduce the debt service and lower rates to something more affordable, potentially so that the rates are no more than 2 percent of the median household income.	• Preliminary rate analysis suggests total monthly charge per household for sewer might be $90 to $130 depending on the financing terms. The longer pipeline distance and small rate base result in relatively high sewer rates. These estimates do not include any DAC grants.

City of Woodland		
	Benefits of Regionalization	**Issues with Regionalization**
Social	• None apparent.	• The community would become a customer of the City of Woodland. The City would want to operate the systems at a similar level of service as the City's system. (This could also be considered a benefit of regionalization.) • The community's future growth plans would need to be coordinated with the City of Woodland.
Environmental	• None apparent	• Esparto, Madison and Wildwings likely have saline groundwater which would produce relatively saline wastewater compared to the less saline water produced after the city constructs its new surface water supply project. While the flow contributions would be relatively small, allowing more saline discharges into the system does undermine the City's salinity reduction efforts.
Financial (Sewer)	• The City would receive sewer connection fees for several hundred and potentially up to 1900 units. This money would be paid to the City upfront as part of SRF loan. • The City would receive water and sewer fees for the operation and maintenance of the systems.	• Non apparent

Table 1.
Yolo County Community Service Agency and District Water and Sewer Systems

	Area	Number of Connected Dwelling Units	Potential Future Growth	Current Monthly Water and Sewer Fees	Current Organization and Staffing	Distance from Woodland Water/ Sewer Systems	Disadvantaged Community Status?	WASTEWATER COLLECTION			WASTEWATER TREATMENT		WATER SYSTEM			Comments
								System Description	Concerns	Approximate Sanitary flows	System Description	Concerns	System Description	Concerns	Metered?	
Yolo County Area	Esparto	974 units	1,500 Units plus 53 acres of commercial available	WW: $40.50 / EDU W: $52 / EDU (flat rate)	Full time staff of 2 in field, 2 in office; CSD Board elected by residents	13.5 miles (along CR 24)	No	All gravity sewers.	SSMP WDR compliance, System age and condition	200,000 gpd	Pump station, screen, aerated ponds and percolation evaporation ponds. Acreage available for expansion	Degradation of local groundwater, increased costs of monitoring	4 wells, hypochlorite disinfection, 500,000 gal storage tank, 3-500 gpm booster pumps	Operator reports that nitrates and arsenic below limits	Yes. 1,000,000 gpd in summer, 500,000 gpd in winter.	Plans to start billing based on water consumption. Plans to build another tank for fire flows
	Madison	237 units (500 year round residents, 480 seasonal workers)	1,500 Units plus 187 acres of commercial available	W & WW: $81 / EDU (flat rate)	Full time staff of one and one part time staff for billing; CSD Board elected by residents	11 miles (along CR 24)	Possibly	All gravity sewers.	SSMP WDR compliance, System age and condition	90,000 gpd	Pump station, 4 aerated ponds, evaporation and percolation ponds	Degradation of local groundwater, increased costs of monitoring	3 wells (one 650 gpm well, one 400 gpm well, one 110 gpm well	Operator reports that nitrates and arsenic below limits; no storage tank, old transite pipes; cannot meet fire flow demands	No	
	Wild Wings	337 units plus a golf clubhouse	Built out	WW: $106 / EDU W: $124/ EDU (average)	The CSA is a dependent special district governed by the Yolo County BOS. A 5 resident WW Advisory Board reports to BOS. California American Water is a contractor for O&M of the water and wastewater systems.	5 miles (along CR 24)	No.	VCP gravity sewers, 1 sewage pump station, 1 sewer forcemain.	SSMP WDR compliance. Wildwings is a gated community.	50,000 gpd	Influent pump station, extended aeration biological package treatment, tertiary filtration, chlorine disinfection, a recycled water storage pond, and irrigation pump station. System rated to treat 101,000 gpd.	Sludge disposal, Costs for tertiary treatment for small rate base	Two sites each equipped with 1 well, . a storage tank, a hydro pneumatic tank, 2 booster pumps, and chlorination facilities	Arsenic, manganese, nitrates in wells.	Yes	
	North Davis Meadows	95 lots plus clubhouse		Information not available.		6.7 miles (along CR 98) 7.5 miles (along CR 102 and CR 29)	No	Individual tanks, grinder pumps, pump into Davis sewer	Individual tanks, grinder pumps, pump into Davis sewer	20,000 gpd	Contract with City of Davis		Two well sites. Well site 1 has a, storage tank, a hydro pneumatic tank, 3 booster pumps, one fire pump.	Well No. 1 has nitrates above 45 mg/L and is not used. No system redundancy. System does not meet fire flow demands.	No	In Davis Sphere of Influence. Current discussions to connect into Davis' water system or complete significant upgrades to system.
	Binning Tract (not a CSA)	30 lots plus church		No fees (individual systems)		6.7 miles (along CR 98) 7.5 miles (along CR 102 and CR 29)	No	Individual septic tanks and leach fields	Failing leach fields	10,000 gpd	Individual septic tanks and leach fields	Failing leach fields	Individual wells on each lot	Nitrates and arsenic levels likely high.	No	In Davis Sphere of Influence
	Knights Landing	317 units	1,400 units plus 51 acres of commercial available	Information not available.	CSD Board elected by residents	9 miles (along CR102)	Possibly			80,000 gpd	30 acres of aerated ponds, evaporation and percolation ponds		Three wells	System cannot meet fire flow demands, water is untreated.	Partially metered	
	Willow Bank	100 lots	Built out	WW: None- Septic W: $100/ EDU (possible average, 2017)	Contract with City of Davis	11 miles (along CR102)	No	Individual Septic Systems	In Davis Sphere of Influence		Individual Septic Systems		Contract with County	High water rates reflect Davis WW compliance with salinity limits.	Yes	

Table 1.
Yolo County Community Service Agency and District Water and Sewer Systems

Area		Number of Connected Dwelling Units	Potential Future Growth	Current Monthly Water and Sewer Fees	Current Organization and Staffing	Distance from Woodland Water/ Sewer Systems	Disadvantaged Community Status?	WASTEWATER COLLECTION			WASTEWATER TREATMENT		WATER SYSTEM			Comments
								System Description	Concerns	Approximate Sanitary flows	System Description	Concerns	System Description	Concerns	Metered?	
	El Macero	410 lots, 37 condos, & clubhouse (467 EDUs total)	Built out	WW: $52.20 / EDU (2013) W: $100/ EDU (possible average, 2017)	Contract with City of Davis	10 miles (along CR102)	No	Gravity Sewer	SSMP WDR compliance.		Contract with County		Contract with County		Yes	In Davis Sphere of Influence
	West Kentucky							Septic tanks					Private water system			
	City of Woodland	22,000	30,000 (Current General Plan Buildout)	WW: $45 / EDU W: $70/ EDU (possible average rate in 2017)	City of Woodland Water and Wastewater Utilities Department	N/A	No. But certain areas of town could quality	Gravity sewers. One pump station serving south area.		5,500,000 gpd	Tertiary wastewater treatment plant with nitrogen removal, discharge to local canal	Surface water discharge permit requires upgrades to meet new state and federal regulations	Currently a series of wells, tanks, and water distribution system. By 2017 City will build a new surface water treatment plant with Davis	The City has acquired water rights for its service area.	Yes	

Figure 1.
Service Area Map