

**CA Wastewater Needs Assessment
Solutions and Cost Assessment
Executive Summary for April 2025 Advisory Group Meeting**

Solutions and Cost Assessment

Overview

Following the Inadequacy and Risk Assessment, the Wastewater Needs Assessment (WWNA) is developing a framework to model high-level solutions and estimate associated costs for facilities designated as inadequate, as well as to consider opportunities for feasible onsite wastewater treatment system (OWTS) conversions. The methodology will be used to estimate a statewide cost to address inadequate wastewater facilities and OWTS conversion opportunities. As in the Drinking Water Needs Assessment (DWNA), the framework is not designed to be used to determine community- or site level decisions and does not replace the preliminary engineering report process. This Executive Summary introduces the types of solutions being considered for inadequate facilities and OWTS conversion. It also discusses proposed approaches and anticipated challenges in assigning solutions.

Methodology and Potential Solutions

Inadequate Facilities

Potential solutions will only be considered for facilities determined to be inadequate by the WWNA's methodology. A facilities list was developed in previous phases of the WWNA and consists of facilities with National Pollutant Discharge Elimination System (NPDES) permits, Waste Discharge Requirements (WDRs), or enrollment in the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems General Order (SSS General Order) that primarily treat domestic wastewater. The WWNA team examined the inadequacy criteria and the associated CIWQS violations to identify the common causes and corrective actions correlated with each. Generally, each inadequacy criterion can be attributed to one or more operational, infrastructure, or administrative deficiencies. The project team is developing solutions for the treatment systems (NPDES permitted & WDR facilities) and the collection systems (facilities enrolled in the SSS General Order) determined to be inadequate. To inform choices of potential solutions, the project team is reviewing engineering reports for wastewater projects submitted to the State Water Board's Division of Financial Assistance (DFA) and applying engineering judgment based on team experience and the insight of State Water Board staff.

Identifying solutions for inadequate wastewater facilities is challenging for a variety of reasons. Without site specific data, it is difficult to determine whether the issue can be solved by (1) adjusting process operations or repairing/replacing equipment, or (2) whether major rehabilitation is needed. The same type of violation could be caused by a variety of factors and/or inadequate components. Finally, it is difficult to identify solutions for facilities with inadequate administrative capacity as granular solution information is not readily available. This type of inadequacy often reflects broader constraints on the facility and community. That being said, the WWNA team was commissioned to develop high-level potential solutions, which are shown below.

Table 1 presents four categories of solutions selected for treatment plants (facilities with NPDES permits and WDRs)— rehabilitation/repair, upgrade, connection to another treatment facility, and administrative support— and examples of alternative solutions.

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Table 1. Proposed Solution categories and alternatives for treatment facilities

Solution Category	Description	Solution Alternative Examples
Repairs and Rehabilitation	<ul style="list-style-type: none"> Replace broken equipment Fix bottlenecks and chokepoints in existing treatment plant Modify existing equipment to improve operation 	<ul style="list-style-type: none"> Repairing aeration system to provide adequate treatment in an activated sludge system Removing algae from a pond system to reduce total suspended solids (TSS) in effluent
Upgrades	<ul style="list-style-type: none"> Additional treatment capability Additional hydraulic capacity 	<ul style="list-style-type: none"> Adding nitrogen removal to standard secondary treatment plant Add effluent filtration to remove TSS
Facility to Facility (F2F) Connection	<ul style="list-style-type: none"> Wastewater is diverted to another wastewater treatment facility (WWTF) with sufficient capacity 	<ul style="list-style-type: none"> Effluent from inadequate WWTF redirected to regional WWTF Decommission inadequate WWTF and divert wastewater to nearby WWTF with sufficient capacity
Administrative Support	<ul style="list-style-type: none"> Addressing issues associated with limited staff or managerial capacity 	<ul style="list-style-type: none"> Managerial consolidation Remote Monitoring Technical assistance (circuit riders)

Table 2 summarizes proposed solution categories and examples for collection systems permitted under the SSS General Order.

Table 2. Proposed solution categories and alternatives for collection systems.

Solution Category	Description	Example Alternatives
Repairs and Rehabilitation	<ul style="list-style-type: none"> Targeted approach to fix problematic sections of infrastructure 	<ul style="list-style-type: none"> Targeted pipe replacement based on frequency of sanitary sewer overflows (SSOs) or age Lining pipes Pump Station Repairs
Replacement	<ul style="list-style-type: none"> Replacement of a significant portion of a collection system's infrastructure 	<ul style="list-style-type: none"> System wide pipe replacement plan Regrading system and constructing additional pump stations
Operations	<ul style="list-style-type: none"> Additional resources to aid in operation of collection system 	<ul style="list-style-type: none"> Spill response cleaning and equipment Cleaning and inspection equipment Cooperative agreements to share maintenance or clean-up equipment
Administrative Support	<ul style="list-style-type: none"> Addressing issues associated with limited staff or managerial capacity 	<ul style="list-style-type: none"> Shared Management Agreement Remote Monitoring Technical assistance (circuit riders)

OWTS

The OWTS portion of the solution and cost assessment is intended to identify opportunities for connecting septic to existing sewer (S2S) (Figure 1) or connecting septic to a community cluster system (S2CC) (Figure 2). See Table 3 for a description of each. The end goal is approximating the cost of connecting OWTS across the state (where feasible) to a treatment facility operated by a Responsible Management Entity

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(RME). Feasibility of connections will be determined by spatial grouping and network analysis. For this assessment, replacement and upgrade of (individual) OWTS is not currently being considered due to the excessively high unit cost of small-scale and site-specific solutions.

Table 3. Proposed solution categories and alternatives for OWTS

Solution Category	Description	Alternatives
Septic to Existing Sewer Connection (S2S)	<ul style="list-style-type: none"> Household waste directed to an existing sewer, rather than an onsite septic system Wastewater is treated by centralized treatment facility 	<ul style="list-style-type: none"> Bypass and decommission existing septic tank Add pumping equipment where needed
Septic to New Community Cluster Systems (S2CC)	<ul style="list-style-type: none"> Household wastewater collected from multiple properties and sent to a new community system rather than individual septic systems. This could be an advanced communal septic tank, small package plant, or other treatment system. Effluent disposal could be subsurface via leach field or surface disposal. The community system would be managed by a Responsible Management Entity (RME), such as a homeowner's association or utility district 	<ul style="list-style-type: none"> Individual septic tanks/pump stations connected to new local communal treatment system New local collection systems connected to an existing local community treatment system

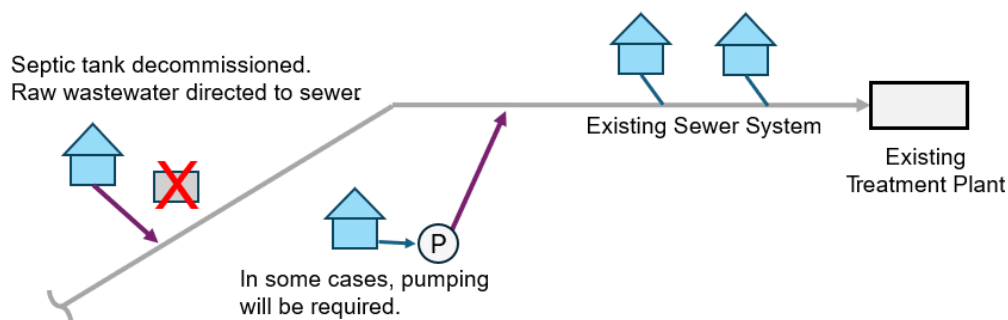


Figure 1. Diagram of septic to sewer (S2S) connection showing two potential options: septic tank abandonment and direct connection of residence to sewer and connection of the septic tank to the sewer system

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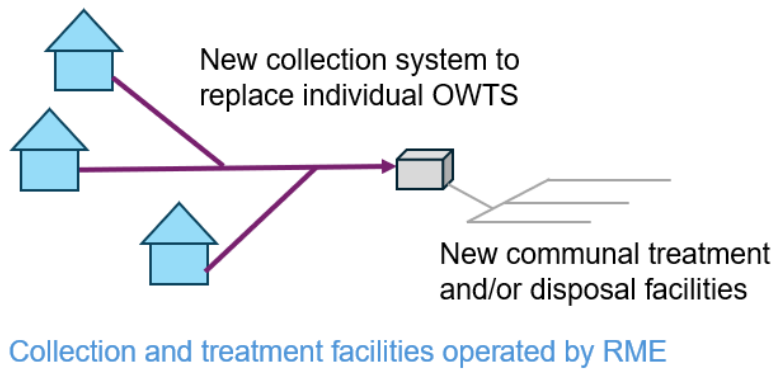


Figure 2. Diagram of septic to community cluster system (S2CC) connection.

Conclusion and Next Steps

WWNA's solutions and cost assessment are intended to approximate solutions and costs for inadequate facilities as determined by the project's Inadequacy and At-Risk Assessments. Cost estimates for feasible opportunities to connect OWTS to existing sewer (S2S) or community cluster systems (S2CC) will also be included. The results will provide high-level insights to support the Water Boards' statewide planning efforts and can also help inform local discussions, particularly in communities seeking reliable sanitation and infrastructure solutions..

The team will continue to develop potential solutions, specifically those that address administrative deficiencies. A methodology to select potential solutions for inadequate facilities will be developed. The team anticipates challenges in determining solutions for inadequate systems due to limited data availability and the inherent nuances in wastewater treatment. In parallel, real cost data associated with similar projects will be extracted from DFA engineering reports and used to develop unit cost estimates for each solution. Additional sources will be sought where sufficient cost data is not found in engineering reports. The team expects this process to be iterative and for the methodology to be refined following the completion of the risk and inadequacy assessment.