

ASSESSING CENTRALIZED TREATMENT UPGRADES AND POU/POE TREATMENT FOR SMALL SYSTEM COMPLIANCE TO THE SDWA

A Sustainability Comparison Study

As an independent research organization, WQRF's research helps provide potential direction for SDWA compliance by providing real-world scenarios faced today by small systems.

WQRF set out to examine the sustainability of treatment upgrades needed at existing small centralized systems and compare that to implementing point-of-use (POU) and point-of-entry (POE) devices for Safe Drinking Water Act (SDWA) compliance.

This case study leveraged real-world data from four community water systems (CWS) and incorporated federal and state regulations to conduct a triple bottom line analysis. The researchers worked closely with CWS Operators and State Administrators to select treatment improvements that were feasible options for removing the contaminant of concern for each CWS. In some cases, the upgrades selected for the centralized treatment allowed for very small modifications to the infrastructure that was already in place.

The study used a 30-year timeframe for the triple bottom line analysis, which consisted of:



- a life cycle analysis to examine environmental impacts (**Planet**)



- a life cycle costing analysis to examine economic impacts (**Profit**)



- an exposure assessment to evaluate human health impacts (**People**)

FINDINGS

POU/POE are viable solutions for drinking water compliance in all case studies and tend to be more protective of public health and of the planet in comparison to the centralized upgrade considered. **Individual state regulatory requirements largely impact whether POU/POE is economically feasible for existing small systems over a 30-year timeline, in comparison to an upgrade to their existing infrastructure;** a newly built system was not a consideration for the purposes of this study.

A REVIEW OF THE BARRIERS TO POU/POE IMPLEMENTATION

Our case studies reside in different EPA regions throughout the country, all offering a unique perspective pertaining to compliance. **Here's a look at the featured locations:**

**Region 1
New Hampshire**

**POU for:
People, Planet, Profit**

24 connections

**Region 5
Illinois**

POE for People

Centralized treatment favors environmental and economic impacts

221 connections

**Region 7
Nebraska**

POU for Planet

Centralized treatment favors human health and economic impacts

75 connections

**Region 9
California**

POU for Planet + People

Centralized treatment favors economic impact

29 connections

The research identifies regulatory burdens placed on alternative solutions like POU and POE for compliance to the Safe Drinking Water Act, are a key factor in each case study's comparative cost analysis.

MANPOWER COSTS

- On-going sampling is **required when using POU and POE treatment**. With this comes additional labor expenses that aren't accounted for in the centralized treatment upgrade's cost as the manpower cost is "baked in" to its operation.
- Some states have provisions that allow for a lower sampling frequency after the first year. However, other states still require the CWS to sample 100% of the households after the first year.
- Per the study, "while all states we worked with required sampling of 100% of the households in the first year of POU/POE device operation (USEPA, 2006b), whether a state can reduce sampling requirements (and therefore lab analysis costs) is state- and contaminant-specific."
- The research shows that Region 5's lab analysis costs could decrease by \$50,000 over 30 years if sampling requirements were decreased for POU/POE systems who have earned NSF/ANSI certifications.

PUBLIC EDUCATION COSTS

- The need for **required, on-going public education** for those utilizing POU and POE treatment options **generates additional expenses** for development and dissemination of educational materials.
- This is another area where CWSs may be able to reduce their overall expenses related to SDWA compliance activities. For example:
 - The Region 1 case study was able to decrease educational costs by distributing materials through virtual means of communication.
 - Additionally, free educational resources are available through the Water Quality Research Foundation, Water Quality Association, and other organizations.

SOLUTIONS: RECOMMENDATIONS FOR FUTURE

WHEELS OF FULL COMPLIANCE MOVE SLOWLY

- Exposure assessment results revealed the importance of the **relationship between the removal efficiency of a treatment solution and the number of years until a solution could feasibly be expected to be implemented** in a community water system.
- While the installation time of POU/POE devices is expected to be quicker than a centralized improvement in many cases, **the planning time (including state approvals, device selection, 100% community participation, etc.) could contribute significantly to how quickly POU/POE devices can be implemented as a compliance solution.**

RECOMMEND CHANGE AT STATE LEVEL

- The researchers suggest that state administrators consider reducing costs by ***"...reviewing the sampling requirements for POU/POE device compliance over time to verify whether the sampling program is both cost effective for the community and whether the POU/POE device is adequately removing the contaminant of concern at a representative number of households within the CWS."***
- Additionally, ***"the state should document the steps taken to approve the POU/POE solution to aid future CWSs interested in using POU/POE devices as a solution and promote knowledge sharing."***
- Consider expanding the options of POU/POE as an approved and accepted compliance option at the state-level.

CONSIDER ADDITIONAL BENEFITS OFFERED BY POU/POE

- While the POU/POE may in practice remove multiple contaminants, **the context around studying implementation and monitoring has been focused only on removal of and compliance with a single contaminant studied.**
- **Using a POU/POE device that is certified to remove more than one contaminant may provide additional benefits to public health and further reduce the need for additional treatment upgrades at the centralized system,** depending on the CWS's specific compliance needs.

MANUFACTURERS CAN HELP

- Include clear information on manufacturer (or trade association) websites that can be used not only by homeowners, but also by CWS managers to understand the appropriateness of POU/POE devices as a SDWA compliance solution.
- Collaborate with state agencies to demonstrate device performance to reduce the overall time required to implement treatment.

TAKE-AWAY FROM THE INDUSTRY

*This study focused on the steps and activities necessary to use POU/POE devices for compliance to the SDWA. The study demonstrates that while homeowners can implement a final barrier solution in their home quickly, regulatory burdens can significantly increase the cost and delay the timeline when these same solutions are used for compliance to the SDWA. Even with the regulatory burdens, most POU/POE options can be installed much quicker providing risk reduction to the community in an expedited fashion. **POU/POE offers additional human health safeguards in that it frequently offers protection against additional and emerging contaminants which should be considered as a long-term tool in the SDWA toolbox for community water systems.***