PREPARED FOR
HAWAII STATE DEPARTMENT OF HEALTH

CESSPOOL CONVERSION FINANCE RESEARCH SUMMARY REPORT

FINAL | JANUARY 2021

Prepared by

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in association with

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State of Hawai`i Department of Health

CESSPOOL CONVERSIONS FINANCE RESEARCH
Summary Report

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Introduction

Act 125 requires the conversion of all cesspools in Hawai'i to approved wastewater treatment systems by 2050. The purpose of this study is to assist the Department of Health (DOH) with the evaluation of the funding, financing, and affordability of cesspool conversions.

LEGISLATIVE ACTIONS TO BAN CESSPOOLS IN HAWAI'I

Throughout the State of Hawai'i, there are approximately 88,000 cesspools, releasing an estimated 53 million gallons per day (mgd) of wastewater to the environment. Most of the existing cesspools provide wastewater disposal for single family residences, as opposed to large-capacity systems serving multiple residences or commercial areas. Given that over 90 percent of the State's drinking water supplies are from groundwater sources, cesspools pose a potential environmental and public health risk.

In 2017, the Hawai'i State Legislature passed Act 125, which mandates that by January 1, 2050, all cesspools in the State, unless granted exemption, shall upgrade or convert to a septic or aerobic treatment unit, or connect to a sewer system (Act 125, 2017). The Legislature subsequently passed Act 132 in 2018, which established a Cesspool Conversion Working Group (Working Group) to develop a long range, comprehensive plan and commission a statewide study of sewage contamination in nearshore marine areas (Act 132, 2018).

As a result of Act 125, homeowners will be required to upgrade their existing cesspools to a wastewater technology that complies with environmental and public health regulations. Historical costs of cesspool upgrades to approved systems range widely from approximately $9,000 to $60,000 or more depending on the wastewater system capacity (based on bedroom count), technology, and location or site constraints.[1] Assuming an average conversion cost of $23,000, the potential magnitude of the financial burden to convert all 88,000 cesspools is over two billion dollars.[2] Cesspool conversion costs will likely be a financial burden to many residential owners in a state where the cost of living is already high. The Legislature tasked the Working Group to develop a strategy to aid the funding and financing of the cesspool upgrades.

Assuming an average conversion cost of $23,000, the potential magnitude of the financial burden to convert all 88,000 cesspools is approximately two billion dollars.

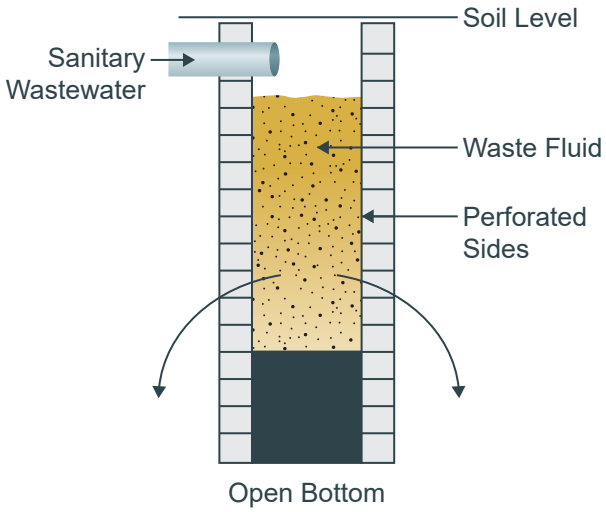


FIGURE 1. Cesspool Schematic
Cesspools are underground excavations that receive sanitary wastewater from bathrooms, kitchens, and washers. The structure usually has an open bottom and perforated walls. Domestic wastewater flows into the structure and the solid waste collects at the bottom of the cesspool. The liquid waste flows out of the perforations and percolates into the subsurface.

1. Based on cost data from DOH.
2. Costs shown in 2020 dollars.

SCOPE OF FINANCIAL EVALUATION OF CESSPOOLS CONVERSIONS

The scope of this study is primarily focused on the funding and affordability challenges associated with cesspool conversions using new or upgraded, single family onsite treatment and disposal systems. Although conversions can also take place via the construction of a new decentralized system, handling wastewater from multiple homes, or connection to an existing treatment plant, the specific financing of these approaches was beyond the scope of this effort.

Given the magnitude of the potential financial burden of cesspool conversions, this report includes the following information to support future planning and considerations for the Working Group:

- Preliminary affordability analysis.
- Potential funding and financing options.
- Lessons learned from conversion programs in other states.
- Other factors which may inhibit cesspool conversions in Hawai'i.

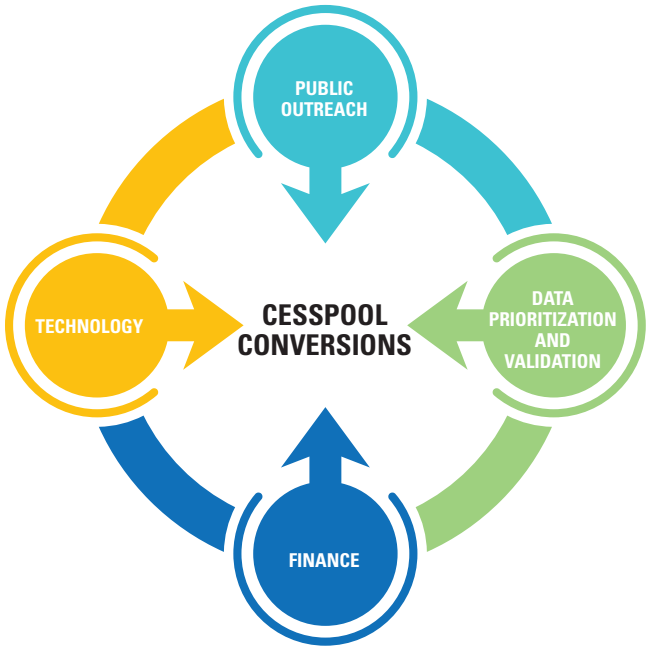


FIGURE 2. Four Aspects of Cesspool Conversion
The working group is engaged in four aspects of cesspool conversions—conversion technologies, finance and funding needs, data prioritization and validation , and public outreach and education.

The details of this effort were presented in a series of the following previously prepared technical memoranda (TMs):

- TM 1 – Cesspool Conversion Funding Mechanisms
- TM 2 – Affordability Evaluation for Cesspool Conversions

Each of these TMs are presented in their entirety in Appendices A and B of this report.

Besides financial considerations, it should be noted that the Working Group is engaged in other areas critical to the success of cesspool conversions, including evaluation of onsite system technologies, public outreach and education, and data validation and prioritization.

LIMITATIONS

The cesspool conversion financial evaluation summarized in this report was prepared specifically for use by the Working Group and was completed based on publicly available information.

Factors that may impact the affordability evaluation include exemptions to cesspool conversion, or changes to the priority areas. Granting exemptions to cesspool conversions are at the discretion of the DOH per Act 125. Ongoing efforts are underway to study available cesspool data validation and prioritization and that new information may result in a new prioritization or even exemption. If new information or guidance results from either of these two efforts, the affordability evaluation should be revisited.

Affordability Evaluation

Homeowners will need to invest significant funds to upgrade their cesspools and maintain their new onsite systems. This study provides a high-level evaluation of the affordability of cesspool conversions for homeowners.

METHODOLOGY

"Affordability" refers to the ability of a household to pay for wastewater services without facing economic hardship. For example, costs would be considered unaffordable, or the household "financially burdened", if they had to consider forgoing medically necessary prescriptions or doctors' visits, sacrifice meals, face the inability to pay for child care, energy bills, or rent/mortgage to pay for a cesspool conversion (Raucher et al, 2019).

A preliminary affordability analysis was performed to estimate the potential financial impacts of cesspool conversions on homeowners. The analysis compared estimated average conversion costs to commonly used measures of affordability, including federal poverty and median household income levels. Figure 3 presents a summary of the approach to affordability used in this study.

Data Sources and Analysis

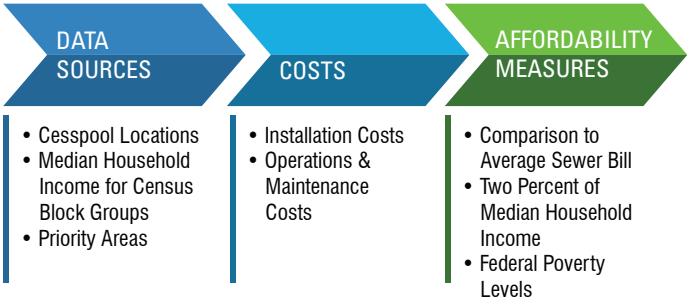


FIGURE 3. Data Sources, Cost, and Affordability Measures Included in Affordability Analysis

The primary data sources for the affordability analysis included:

- Maps of cesspool locations gathered from the Hawai'i Statewide Geographic Information System (GIS) Program.
- Median household income data from the United States Census Bureau (U.S. Census Bureau, 2018).
- Priority areas for cesspool conversions based on environmental and public health risks (DOH, 2018).

KEY AFFORDABILITY QUESTIONS

The affordability analysis aimed to answer some of the following key questions of the Working Group:

- What percent of income should a typical household be expected to spend on cesspool conversion?
- How likely is it that a cesspool owner either lives below the poverty level or is significantly income-constrained?
- How much financial aid is required for those who are financially burdened so a cesspool conversion is affordable?
- How does the conversion cost compare to the monthly sewer bill for existing county sewered areas?

A geospatial analysis of the Hawai'i cesspool locations was performed to assign economic and prioritization data to each cesspool site. For each household with a cesspool, a corresponding median household income was assigned using the median household income data from the United States Census Bureau (U.S. Census Bureau, 2018). Cesspool conversion priority levels were based on those identified in the 2018 Legislative Report and are defined as follows, with Priority 1 being the highest priority and Priority 4 being the lowest.

- **Priority 1:** Significant risk of human health impacts, drinking water impacts, or draining to sensitive waters.
- **Priority 2:** Potential to impact drinking water.
- **Priority 3:** Potential impacts on sensitive waters.
- **Priority 4:** Impacts not identified.

Table 1 summarizes the current priority areas by geographic regions. DOH may revisit the cesspool prioritization methods, and as a result, priority areas could be revised.

TABLE 1. Initial Priority Upgrade Areas Established by DOH Wastewater Branch (DOH, 2018)

GEOGRAPHIC AREA	PRIORITY LEVEL ASSIGNED	NUMBER OF CESSPOOLS	ESTIMATED EFFLUENT DISCHARGE (MGD)
Upcountry area of Maui	1	7,400	4.40
Kahalu'u area of O'ahu	1	740	0.44
Kea'au area of Hawai'i Island	2	9,300	4.90
Kapa'a/Wailua area of Kaua'i	2	2,900	2.20
Poipu/Koloa area of Kaua'i	2	3,600	2.60
Hilo Bay area of Hawai'i Island	3	8,700	5.60
Coastal Kailua/Kona area of Hawai'i Island	3	6,500	3.90
Puako area of Hawai'i Island	3	150	0.60
Kapoho area of Hawai'i Island	3	220	0.12
Hanalei Bay area of Kaua'i	3	270	0.13
Diamond Head area of O'ahu	3	240	0.17
'Ewa area of O'ahu	3	1,100	0.71
Waialua area of O'ahu	3	1,080	0.75
Waimanalo area of O'ahu	3	530	0.35
	TOTAL ASSIGNED	42,730	26.87
Hawai'i Island Un-Assigned	NA	24,430	12.18
Kaua'i Un-Assigned	NA	6,930	4.57
Maui Un-Assigned	NA	4,800	3.50
O'ahu Un-Assigned	NA	7,610	5.08
Moloka'i Un-Assigned	NA	1,400	0.80
	TOTAL UN-ASSIGNED	45,170	26.13
	OVERALL TOTALS	87,900	53.00

Cost Impact of Cesspool Conversions on Homeowners

Depending on the financing source and onsite system required, conversion costs could range from approximately $94 to $339 per month as shown in the Table 2. The table summarizes the potential costs to homeowners for a range of cesspool upgrade options. The "low" scenario represents the simplest and most straightforward upgrade. The "average" and "high" scenarios represent typical and more complex cesspool upgrades, respectively for the purposes of this analysis. More complex onsite systems may be required if a higher level of treatment is needed due to the potential risks to the environment or human health or if individual site conditions such as size and topography warrant a more complex system.

TABLE 2. Summary of Potential Monthly Financial Impacts to Homeowners

COST DESCRIPTION	CESSPOOL CONVERSION COST SCENARIOS		
	LOW	AVERAGE	HIGH
Installation Cost[1]	$10,000	$23,000	$38,000
Monthly Installation Repayment Cost[2]	$61	$139	$230
Monthly O&M Cost[3]	$33	$71	$109
Estimated Total Monthly Cost	$94	$210	$339

Notes:
(1) Installation costs are based on historical costs for septic tank and aerobic treatment unit treatment and disposal systems from DOH. The low costs represent the 10th percentile, and the high costs represent the 90th percentile. All conversion costs are site specific and these costs may not be representative for more complex sites/installations.
(2) Assumes a 20-year loan at 4.0 annual interest rate.
(3) Assumed monthly operations and maintenance (O&M) costs for different levels of onsite treatment.

It is important to note that the costs shown in Table 2 are based on a limited data set of historical costs. Actual conversion costs for homeowners could be greater or less than the scenarios shown. Homeowners, or entities implementing cesspool conversions, should contact a licensed engineer or contractor for a site-specific estimate or price quote.

Affordability Measures

Median Household Income and Federal Poverty Levels

Historically, affordability for water and wastewater service has been benchmarked as a percentage of median household income. The United States Environmental Protection Agency (USEPA) has advanced this metric in the past, stating that wastewater service should be less than 2 percent of income to be considered "affordable" for customers (USEPA, 1997).

Shortcomings of using median household income data from the U.S. Census and federal poverty level data are that the data do not differentiate between renters and homeowners, which may provide further levels of income stratification. The income data used for this analysis is that of the "resident." Renters may report income that is then reflected in the census data but ultimately, they may not be directly paying for the cesspool conversion. However, considering the available information, median household income was considered the best data available for the affordability analysis.

Comparison to Local Sewer Rates

Many communities across the United States are served by centralized wastewater collection and treatment systems. While these are less prevalent in Hawai'i compared to other states, there are county owned and operated wastewater systems across the State that can offer a comparative monthly cost for residential households. While comparing cesspool conversion costs with county sewer service charges does not measure affordability (as the monthly sewer bills may exceed 2 percent of income for some customers), it does provide a local benchmark for sewer utility costs.

AFFORDABILITY RESULTS

Assuming the estimated average monthly cost to convert a cesspool to an onsite wastewater treatment system is $210 and a homeowner is financially burdened if this cost exceeds 2 percent of their annual income, homeowners with an annual income of less than $126,000 would realize a financial hardship by the cost to convert. If a hypothetical $10,000 rebate for the conversion were provided to homeowners, the estimated average monthly cost to convert would drop to $150, and homeowners with an annual income of less than $90,000 per year would be financially burdened.

Statewide Affordability

Figure 4 summarizes the household income for all residents with cesspools across the State. Approximately 97 percent of all residents with cesspools have an income less than $126,000 and thus would be financially burdened by the cost to convert. If a $10,000 rebate were provided to each household, approximately 85 percent would be financially burdened.

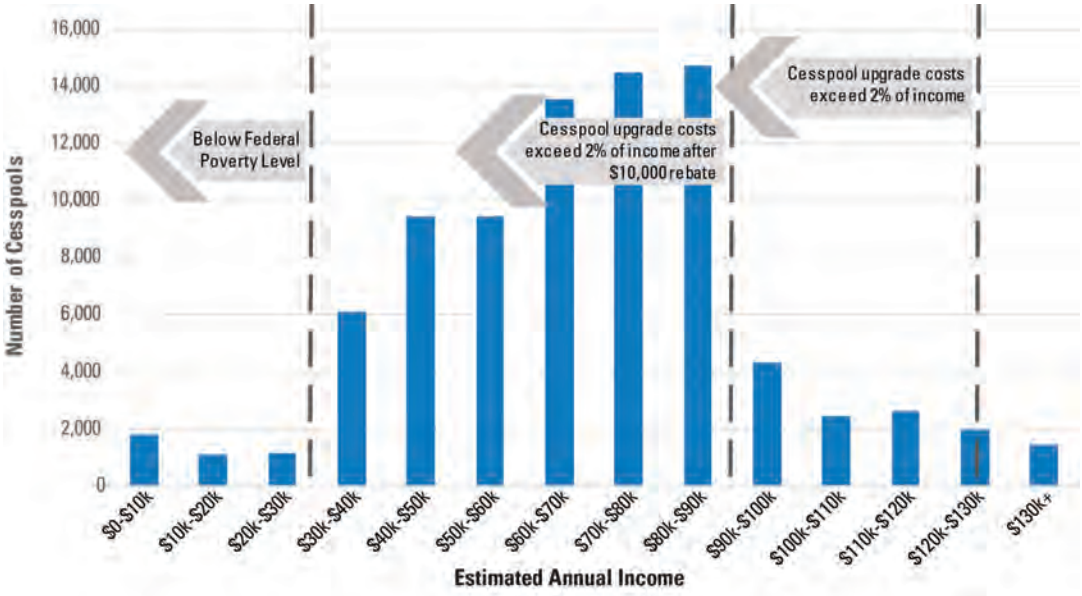


FIGURE 4. State of Hawai'i Annual Estimated Household Income Levels for Residents with Cesspools [1]

Notes:
(1) Assumes average cesspool conversion cost of $210 per month.
(2) Assumes $10,000 rebate reduces average cesspool conversion cost to $150 per month.
(3) Estimated annual income is based on the census block median household income.

County-by-County Affordability

The data were also evaluated at the county level to determine if certain counties or areas of counties were financially burdened more than others. Figure 5 summarizes the household income for all residents with cesspools across the State by county.

The County of Hawai'i has the largest number of cesspools and the most residents that would be financially burdened by the cesspool conversion cost.

The following sections summarize the affordability results determined for each county. The results include:

- Maps that indicate the location and associated relative median household income of each cesspool, as well as priority areas for cesspool upgrades.
- Graphs summarizing the annual estimated household income levels for residents with cesspools.
- Discussion of the fraction of households who would be financially burdened by cesspool upgrade costs and the fraction of cesspools that are a high priority to upgrade (those classified as Priority Levels 1, 2, or 3).

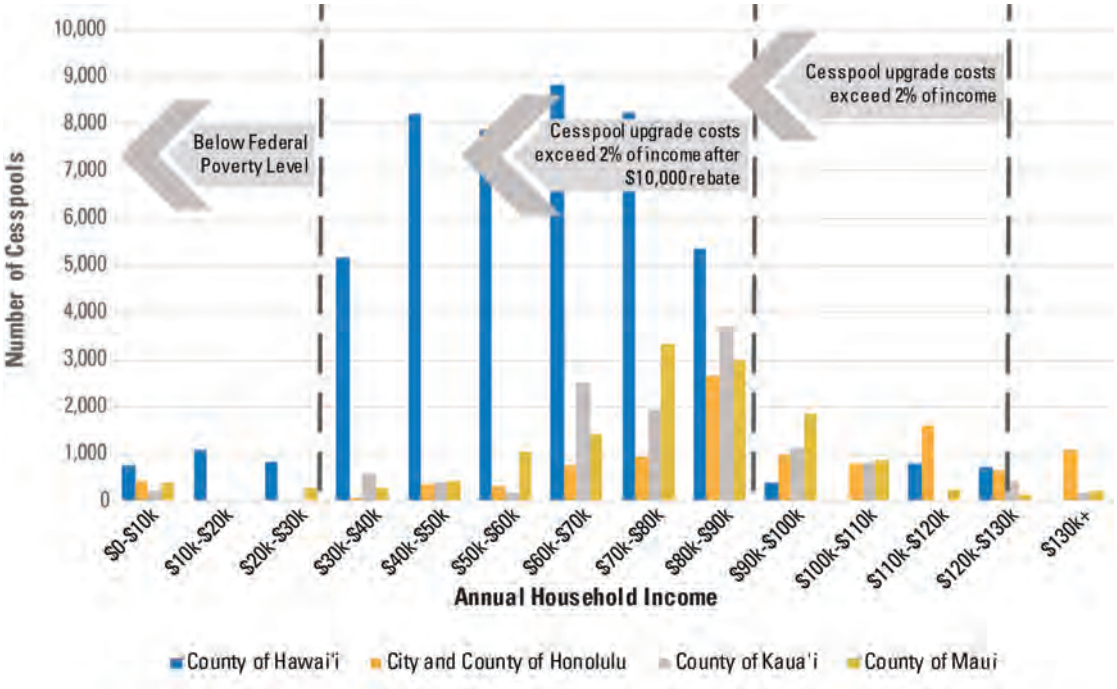


FIGURE 5. Annual Median Household Income of Residents with Cesspools Across the State

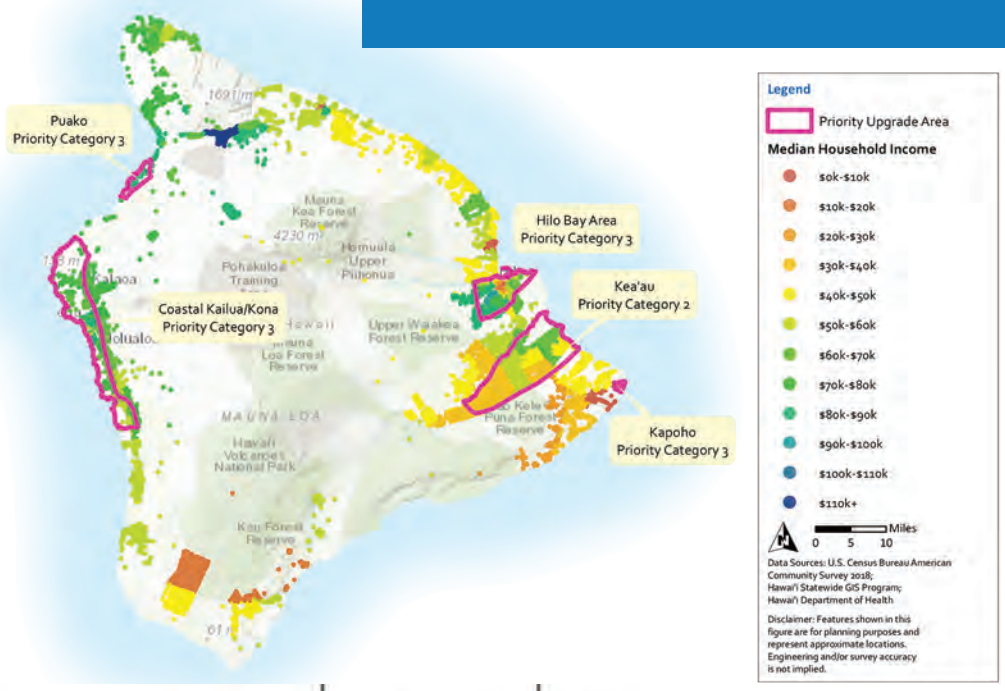
Notes:
(1) Assumes average cesspool conversion cost scenario of $210 per month.
(2) Assumes $10,000 rebate reduces average cesspool conversion cost to $150 per month.
(3) Estimated annual income is based on the census block median household income.

97 percent of households with cesspools would be financially burdened by the cost to convert their cesspool to an onsite wastewater treatment system.

County of Hawai'i

The County of Hawai'i has the largest number cesspools with 48,303, including approximately 9,300 categorized as Priority 2 with potential impacts to drinking water, and 15,570 Priority 3 cesspools with potential impacts to sensitive waters. Hawai'i County also has the most residents facing affordability challenges. Hawai'i County also has the greatest proportion of households without centralized sewers than any other county (71 percent), indicating that connection to a centralized sewer system is unlikely to be available for most properties. Without options to connect to an existing sewer, the only option for many cesspool owners in Hawai'i County is likely the installation of an approved onsite system.

Hawai'i County has the greatest affordability challenges, the most cesspools of all counties, and a large proportion with potential impacts to drinking water and sensitive coastal waters.



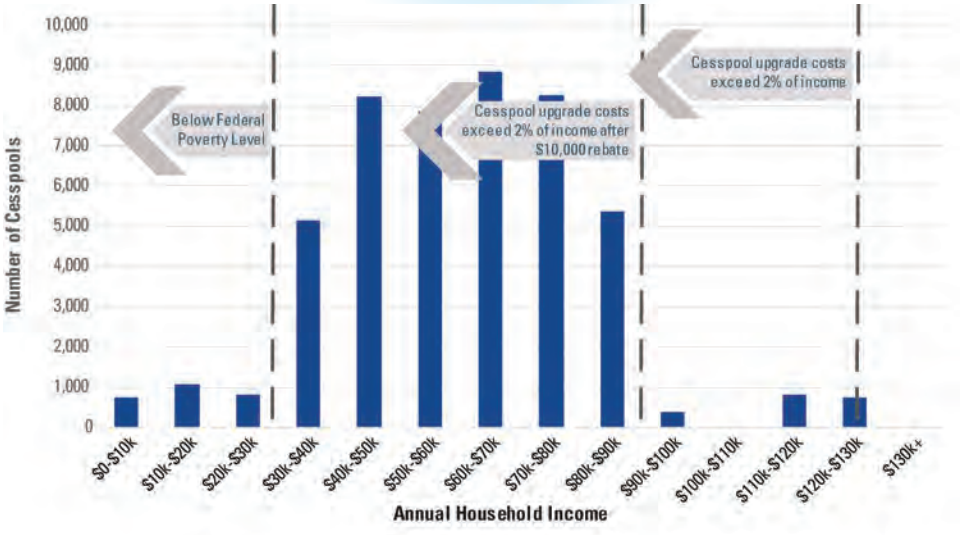


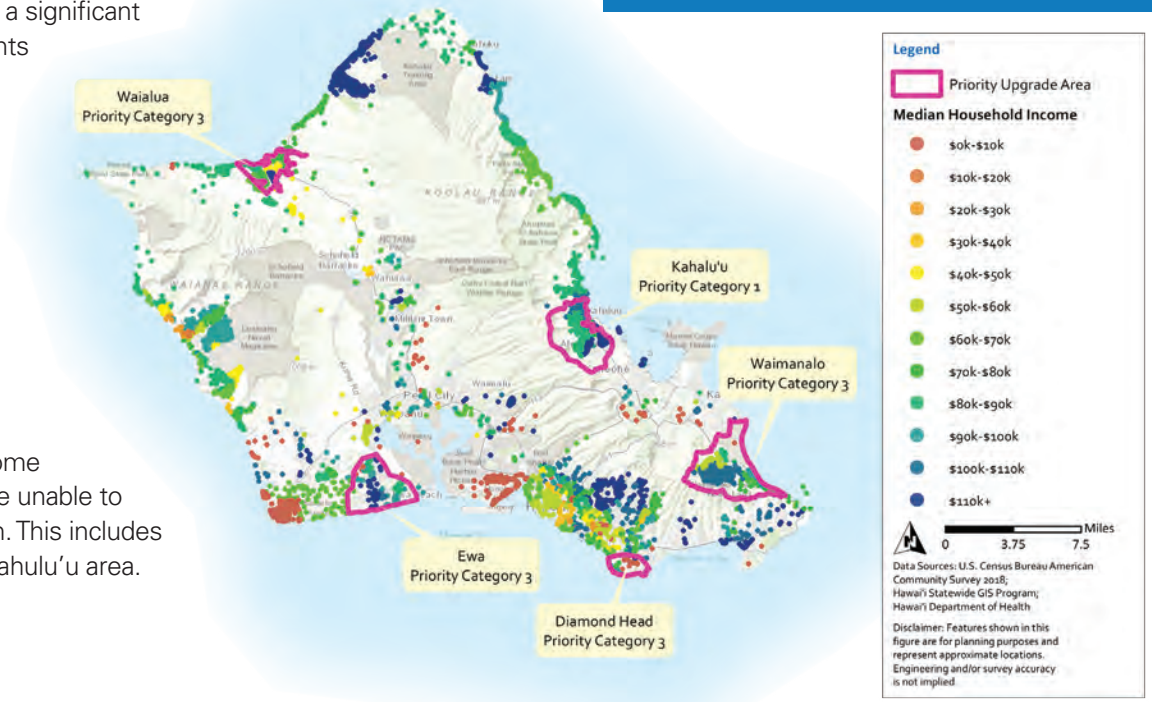
FIGURE 6. Hawai'i County Cesspools and Estimated Household Income Levels

Notes:
(1) Assumes average cesspool conversion cost scenario of $210 per month.
(2) Federal Poverty Level: $30,718 annual income or less.
(3) Cesspool upgrade costs exceed 2 percent of income if the annual household income is less than $126,000.
(4) If a household is provided a $10,000 rebate, cesspool upgrade costs exceed 2 percent of income if the annual household income is less than $90,000.

City and County of Honolulu

The City and County of Honolulu has 10,749 cesspools. This includes 740 in the Kahulu'u area that are categorized as Priority 1 with significant risk to public health and the environment, and approximately 2,910 Priority 3 cesspools with potential impacts to sensitive waters. Most homeowners are connected to a regional sewer system. As a result, the City and County of Honolulu has the lowest percentage of households with a cesspool at 3 percent. Honolulu's residents have a higher income on average compared to the other counties, but Honolulu also has a significant number of residents with incomes below $10,000 per year. Therefore, while the county as a whole may not have the same broad affordability challenges as other counties, some households will be unable to pay for conversion. This includes residents in the Kahulu'u area.

The City and County of Honolulu has 740 Priority 1 cesspools in the Kahulu'u area, many of which will require financial assistance for conversions.



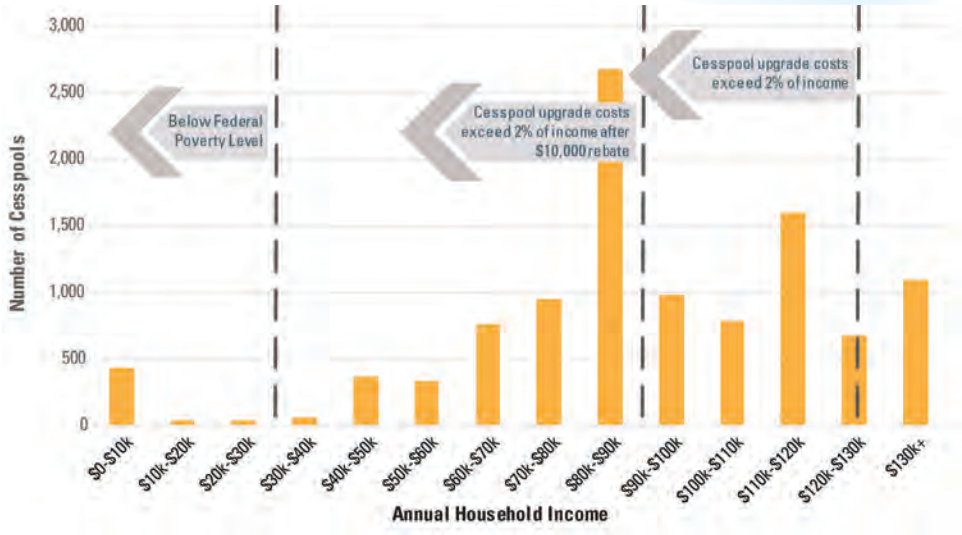


FIGURE 7. City and County of Honolulu Cesspools and Estimated Household Income Levels

Notes:
(1) Assumes average cesspool conversion cost scenario of $210 per month.
(2) Federal Poverty Level: $30,718 annual income or less.
(3) Cesspool upgrade costs exceed 2 percent of income if the annual household income is less than $126,000.
(4) If a household is provided a $10,000 rebate, cesspool upgrade costs exceed 2 percent of income if the annual household income is less than $90,000.

County of Kaua'i

The County of Kaua'i has 12,085 cesspools, including 5,211 categorized as Priority 2 with potential impacts to drinking water, and 160 Priority 3 cesspools with potential impacts to sensitive waters. Approximately 54 percent of all households on Kaua'i have cesspools. More than 11,000 households located in Kaua'i County, or 95 percent, are expected to face affordability challenges for cesspool conversions without some form of financial assistance.

The County of Kaua'i has 12,085 cesspools. Approximately 11,507 households in Kaua'i County, or 95 percent, are expected to face affordability challenges with conversions.

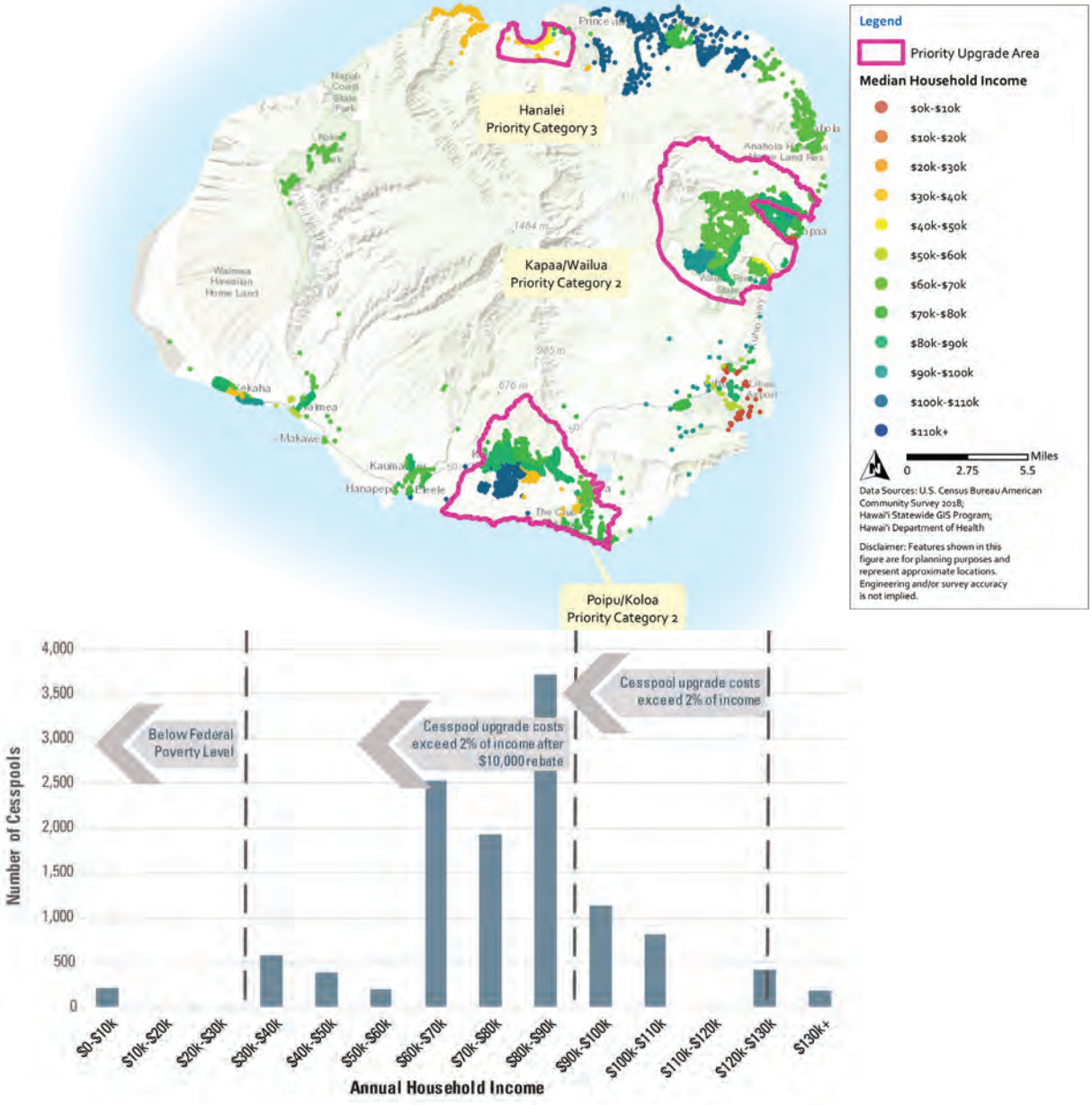


FIGURE 8. County of Kaua'i Cesspools and Estimated Household Income Levels

Notes:
(1) Assumes average cesspool conversion cost scenario of $210 per month.
(2) Federal Poverty Level: $30,718 annual income or less.
(3) Cesspool upgrade costs exceed 2 percent of income if the annual household income is less than $126,000.
(4) If a household is provided a $10,000 rebate, cesspool upgrade costs exceed 2 percent of income if the annual household income is less than $90,000.

County of Maui

The County of Maui has 12,085 cesspools on the island of Maui, and 1,439 cesspools on the island of Moloka'i. The Upcountry Maui region has the most Priority 1 cesspools in the State, with 5,777 that are predicted to have significant impacts to public health. Approximately 22 percent of all households in Maui County have cesspools. About 98 percent of Maui cesspool homeowners (11,888), and 100 percent of Moloka'i cesspool homeowners will be challenged to afford cesspool conversions without financial assistance.

Upcountry Maui has the most Priority 1 cesspools in the State. Approximately 98 percent of Maui cesspool homeowners (11,888), and 100 percent of Moloka'i cesspool homeowners will be challenged to afford cesspool conversions without financial assistance.

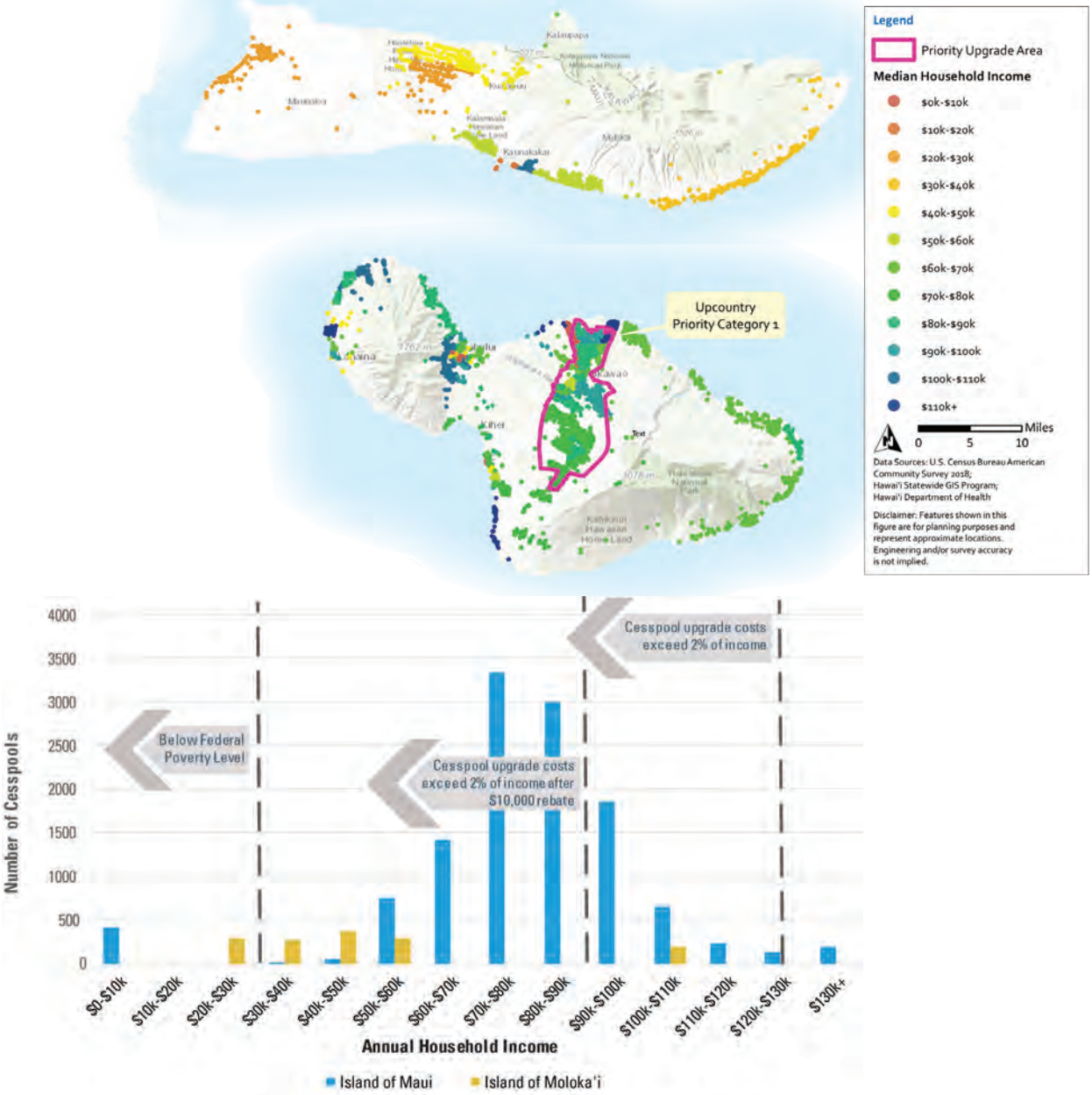


FIGURE 9. Island of Maui and Island of Moloka'i Cesspools and Estimated Household Income Levels

Notes:
(1) Assumes average cesspool conversion cost scenario of $210 per month.
(2) Federal Poverty Level: $30,718 annual income or less.
(3) Cesspool upgrade costs exceed 2 percent of income if the annual household income is less than $126,000.
(4) If a household is provided a $10,000 rebate, cesspool upgrade costs exceed 2 percent of income if the annual household income is less than $90,000.

Comparison to Local Sewer Rates

Figure 6 shows typical average monthly sewer service charges for wastewater collection and treatment for the various counties compared to the monthly cost for cesspool conversion for the low, average, and high cost conversion scenarios. In general, monthly conversion costs are estimated to be higher than monthly sewer bills. Hawai'i County has the lowest monthly wastewater bill at $40 per month on average, while the City and County of Honolulu has the highest at $111 per month. As a percent of median household income for each county, the monthly wastewater bills range from 0.8 percent (Hawai'i County) to 1.6 percent (City and County of Honolulu). Given monthly conversion costs are estimated to be higher than monthly sewer bills, and in some cases substantially higher, it is reasonable to assume that additional funding will be required to make conversions affordable for most residents.

On average, monthly cesspool conversion costs are estimated to be higher than monthly sewer bills.

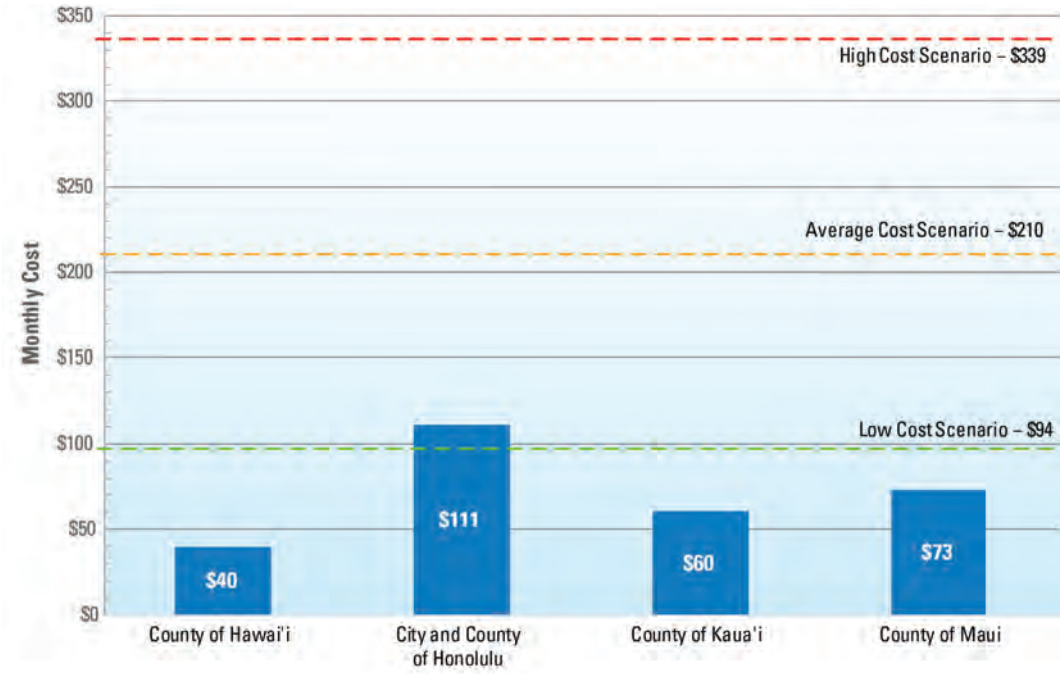


FIGURE 10. Typical Monthly Sewer Bill Compared to Monthly Cesspool Conversion Costs for Low, Medium, and High Cost Scenarios

Notes:
(1) County of Hawai'i – single family monthly flat rate of $40.00.
(2) City and County of Honolulu – based on estimated single family water usage of 9,000 gal/month. Wastewater bill is 80 percent of water usage$4.63/kgal + base fee of $77.55 = $110.89.*
(3) County of Kaua'i – single family monthly flat rate of $60.09.
(4) County of Maui – based on estimated single family water usage of 9,000 gal/month. Wastewater bill is based on all water usage up to 9,000 gals at $4.50/kgal + base fee of $32.50 = $73.00.

Cost and Affordability Relative to Priority Levels

With limited funds available to directly support conversions, the State may need to prioritize how available financial assistance is allocated. Table 3 presents the estimated cost to upgrade all cesspools in the State broken down by priority area and affordability based on two percent of the median household income. The average conversion cost of $23,000 was assumed to estimate the total funding required for complete conversions.

To fully fund all cesspool conversions for those who are financially burdened, an estimated $1.9 billion in funding is required.

TABLE 3. Estimated Cost to Convert All Cesspools by Priority Level and Median Household Income

PRIORITY LEVEL	NUMBER OF CESSPOOLS	TOTAL CONVERSION COST ($ MILLIONS)[1]
Replacement Costs are Considered Affordable (Costs are Less than 2 percent of Estimated Household Income[2])		
1	98	$2.3
2	179	$4.1
3	589	$13.5
4	1,427	$32.8
SUBTOTAL	2,293	$52.7
Replacement Costs are Considered Unaffordable (Costs are Greater than 2 percent of Estimated Household Income[3])		
1	8,434	$194.0
2	14,321	$329.4
3	17,717	$407.5
4	41,952	$964.9
SUBTOTAL	82,424	$1,895.8
TOTAL	84,717[4]	$1,948.5

Notes:
(1) Based on average conversion cost of $23,000.
(2) Includes residents who may be able to afford cesspool conversions without financial assistance.
(3) Includes residents who are financially burdened by cesspool conversion costs and may require financial assistance.
(4) Total number of cesspools by Priority Level comes from the Hawai'i Statewide GIS Program. Note this is slightly lower than the 87,900 estimate from the Legislative Report (DOH, 2018).

Private Financing and What Can Be Afforded

Another way to determine the amount of financial assistance needed is to consider the portion of the cesspool conversions costs that can be afforded by homeowners. With the exception of those with estimated annual income below the FPL, it was assumed that households could afford to privately finance an amount that results in a monthly payment less than or equal to 2 percent of their estimated monthly income less the average monthly maintenance cost for the selected replacement technology. If that amount is less than the average of conversion costs, it is assumed the difference would require financial aid.

Table 4 summarizes the estimated amount of conversion costs that can be afforded or privately financed versus the amount of financial aid that may be required. It is anticipated that more than $1 billion in financial aid is required to support cesspool conversions for homeowners who are financially burdened.

TABLE 4. Estimated Private Financing and Financial Aid Required for Cesspool Conversions[1]

PRIORITY	TOTAL PRIVATE FINANCING[2] ($ MILLION)	TOTAL FINANCIAL AID REQUIRED[3] ($ MILLION)
1	$89.8	$106.5
2	$94.2	$239.3
3	$164.7	$256.3
4	$312.4	$685.3
TOTAL	$661.1	$1,287.4

Notes:
(1) Based on average conversion cost of $23,000.
(2) Assumes residents can afford up to 2 percent of estimated household income for cesspool conversions, financed at 4 percent interest over 20 years.
3) Assumes cesspool conversion costs in excess of 2 percent of estimated household income will require financial aid. Residents with income levels below the federal poverty limit are assumed to require financial support for all conversion costs.

Cesspool Conversion Funding Mechanisms

There are a limited number of financing mechanisms available to achieve the level of funding necessary to make all cesspool conversions affordable.

CESSPOOL CONVERSION FUNDING CHALLENGES

There are several challenges associated with identifying viable funding mechanisms for Hawai'i's cesspool conversion program. First, the magnitude of the potential amount of funding that the program requires is significant, whereas, based on the average cost of cesspool conversions, it is estimated that the total cost of the conversions within the State is on the order of $2 billion, this cost may range from $880 million to more than $5.3 billion.[2] While there are low interest loan and grant funding opportunities from federal, state, and local financing sources, all of these combined fall significantly short of that required to fully fund all conversions. In addition, most of the financing programs are available only to government entities such as the state or counties, or non-profit organizations, and are not targeted at private, residential property owners. This is further complicated by the fact that the State and the counties do not currently have the staff or the administrative capabilities to receive grant or loan funds, review and process individual applications, disperse the funds to homeowners, and, in the case of loans, conduct follow-up payment collection. Lastly, most of these financing programs provide a reimbursement for incurred cost, requiring the individual homeowners to first pay upfront the cost associated with planning, design, and construction of the new onsite wastewater treatment system, and then be reimbursed.

Due to the varying demographics, socio economics, implementation timeline, and system costs, there is not a "one size fits all solution" for the financing mechanism across all counties in Hawai'i.

The ideal cesspool conversion funding program will need to meet several objectives.

KEY OBJECTIVES OF THE CESSPOOL CONVERSION FUNDING PROGRAM

- Consider equitability and affordability issues.
- Incentivize individual homeowners to convert existing cesspools.
- Provide funding support for upfront cesspool conversion costs.
- Consider the funding recipient (e.g., cesspool homeowner, agency, etc.)
- Balance the need for immediate-, near-, and long-term expenditures.
- Potentially fund a variety of onsite wastewater treatment technology options.
- Minimize the administrative burden on the DOH while leveraging support from existing or new local agencies to administer cesspool conversion funding responsiblities.

There is a need to identify or develop a mechanism that can funnel federal, state, or other funding or incentives to individual homeowners through existing or new organizations such as the counties, non-profits, or financial institutions. The proposed financing program will also likely need additional funding for state and/or local governments to administer and fund the program options.

2. Historical cesspool replacement costs range from $9,000 to $60,000 per conversion. The range shown is for conversion of all 88,000 cesspools in Hawai'i.

FINANCING OPTIONS

Financing options may include tax credits or rebates, federal, state, or county grants, and private/mortgage loans. A notable difference between grants and loans are that grants do not need to be repaid, while loans are borrowed funds that require repayment, typically with interest. These financing options and potential funding agencies are summarized below.

Private/Mortgage Loans

It will be a challenge and likely infeasible for financial support to be provided to all cesspool owners for the conversions. Thus, it will likely be necessary for homeowners to seek private or mortgage loans to finance the conversions. There are several private financing options available to homeowners including: personal loans, home equity loans, or the use of personal savings. Given the economic turmoil caused by the global COVID-19 pandemic in 2020, the current, low interest rates provided by private lending options may be an economical option for some residents.

State Tax Credits or Rebate Programs

The State of Hawai'i's temporary tax credit program (Act 120), which provides up to $10,000 in incentives for individual homeowners to convert cesspools to septic systems or aerobic treatment units, is set to expire on December 31, 2020. Legislation which would extend the term of the credits did not pass in the most recent legislative session. Given that less than 100 applications have been filed for this credit to date, tax credits may have limited appeal and application and there may be a need to re-evaluate the tax credit mechanism and identify opportunities to make the program more enticing. A rebate program may have broader appeal and applicability for cesspool conversions.

Grants and Loans

Federal, state, and local grant and loan funding sources should also be considered as potential funding mechanisms. While these sources do not provide a reliable long-term solution for financing cesspool upgrades, they can help with the implementation of portions of the program.

Funding agencies with potential financing mechanisms include:

- United States Environmental Protection Agency
- United States Department of Interior, Bureau of Reclamation
- United States Department of Agriculture
- United States Department of Housing and Urban Development
- United States Department of Commerce - Economic Development Administration
- State of Hawai'i Clean Water State Revolving Fund (CWSRF)
- State of Hawai'i - Non-Point Source (319) (NPS) Grants
- State of Hawai'i Rural Community Assistance Corporation
- State of Hawai'i Rural Water Association
- Proposed – Hawai'i Cesspool Remediation and Conversion Loan Program

Potential CWSRF Funding Mechanisms

There may be opportunities within the State of Hawai'i's CWSRF program for non-profits or public entities to pursue funding or to create a pilot program to provide loans or grants to residential homeowners. The CWSRF program provides low interest loans for a wide range of water quality infrastructure projects. Loans to finance non-point source projects, including cesspool conversions, can be provided through several funding mechanisms, depending on type of project, repayment source, and on agreement by the state program.[3] Typically, CWSRF funding can only be provided to public entities, however the State of Hawai'i's program allows for funding to be provided to individuals for cesspool conversions or can be provided via the counties, other federal/state agencies, non-profits, or financial institutions. These institutions can act as the broker to make sub-loans to individual homeowners for the cesspool upgrades.

In a survey of other cesspool funding programs, funding is provided by the state or the CWSRF program to a local intermediary agency that is then fiscally responsible for the loan and the overall administration, thereby reducing the burden on the CWSRF staff. Cesspool financing programs in other states, have been funded with CWSRF funds, USEPA grants, state bonds, legislative funding or other state funding sources. Mechanisms that have been utilized successfully include: Conduit Lending (Pass Through), Linked Deposits, Sub-state Revolving Funding, and Direct Loans.

It is estimated that $5 million per year is the maximum financing that can currently be obtained through the CWSRF program. This level of funding represents less than 10 percent of the average annual cost of all conversions to meet the 2050 deadline.

3. A non-point source is a source of pollution that originates from widely distributed elements (such as runoff from agricultural or residential areas) as opposed to a single point source (such as a wastewater treatment plant or a factory). In the 2015-2020 Hawai'i Nonpoint Source Management Plan, cesspool wastewater runoff was identified as a non-point source impacting the State's resources and therefore may be eligible for NPS Grant funding.

Other Funding Models and Partnerships

Funding approaches and partnerships employed by the energy sector or other utilities may serve as a model. While other utilities have different drivers and payback periods, some of their funding models may be applicable to funding a portion of cesspool conversions.

On-Bill Financing Program – Example: Hawai'i Green Infrastructure Authority

Two funding models previously utilized in Hawai'i are on-bill financing and on-bill repayment programs. On-bill financing allows the electric utility (e.g., Hawaiian Electric, Maui Electric, or Hawai'i Electric Light) to incur the cost of a clean energy upgrade to a home, which is then repaid by the homeowner through their monthly utility bill. Upfront capital is provided by a third party, by the Hawai'i Green Infrastructure Authority, not the electric utility. In some on-bill repayment programs, the loan is transferable to the next owner of the home, building, or property. The idea of an on-bill financing program could be adapted to finance cesspool conversions with the assistance of county or local agencies (e.g. water or wastewater utilities) that could assist in the billing administration function similar to electric utilities.

An on-bill financing model that currently exists in Hawai'i is the Green Energy Money $aver On-bill (GEM$) program whose purpose is to deploy clean infrastructure. The program enables ratepayers to finance clean energy improvements through an on-bill financing model that spreads the initial capital costs of installing green infrastructure up to 20 years.

Property Assessments – Example: Property Assessed Clean Energy Program

Another energy-based funding model that could be adapted to finance cesspool conversions is the Property Assessed Clean Energy (PACE) program. This is a mechanism used by local governments to allow property owners to finance the up-front cost of energy efficiency and renewable energy improvements (such as solar) and then pay the costs back over time through a voluntary assessment. A PACE program could be modified as a viable financing option for cesspool conversion to allow a property owner to pay back costs over time at an agreed upon interest rate and length of loan term. Funding would occur through private lenders, e.g., private banks, or the issuance of municipal bonds.

Property Assessments – Example: Community Facilities District and Special Improvement Districts

The use of Community Facilities Districts or Special Improvement Districts, which are independent, local special-purpose financing districts that levy taxes and assessments and issue bonds to provide infrastructure to develop communities of all types, could be another mechanism by which to fund cesspool conversions. A special improvement district specifically created to address the USEPA's requirement to close large-capacity cesspools is the Lono Kona Sewer Improvement District in North Kona in the County of Hawai'i. This program funds the connection of 110 parcels to the county wastewater system. A similar funding mechanism could be applied to the funding of onsite systems for a neighborhood of current cesspool owners.

Public Private Partnerships

Another potential funding mechanism is the development of Public-Private Partnerships (P3s) that encourage private investment in public infrastructure projects. P3s are contractual arrangements in which governments or public entities form partnerships with the private sector to design, finance, build, and operate and/or maintain infrastructure such as toll roads, water supply facilities, and wastewater treatment plants. Public agencies are in charge of financing and theoretically pass risks related to operating costs and project revenues to the private partner. However, P3s also have some negative aspects including potential local opposition, loss of public control and flexibility, potential need for in-house expertise or outside consultants, complicated contracts and complex negotiations, as well as significant effort to enforce and monitor contracts.

LESSONS FROM FUNDING OF CESSPOOL CONVERSIONS IN OTHER STATES

Cesspool conversion mechanisms used in eleven other states were reviewed with the focus on those with programs funding the conversion of cesspools with onsite systems. These states incentivized individual residential or commercial owners to convert failing systems by providing financial support, in the form of loans, grants or incentives, to defray the costs associated with the implementation of the new technology.

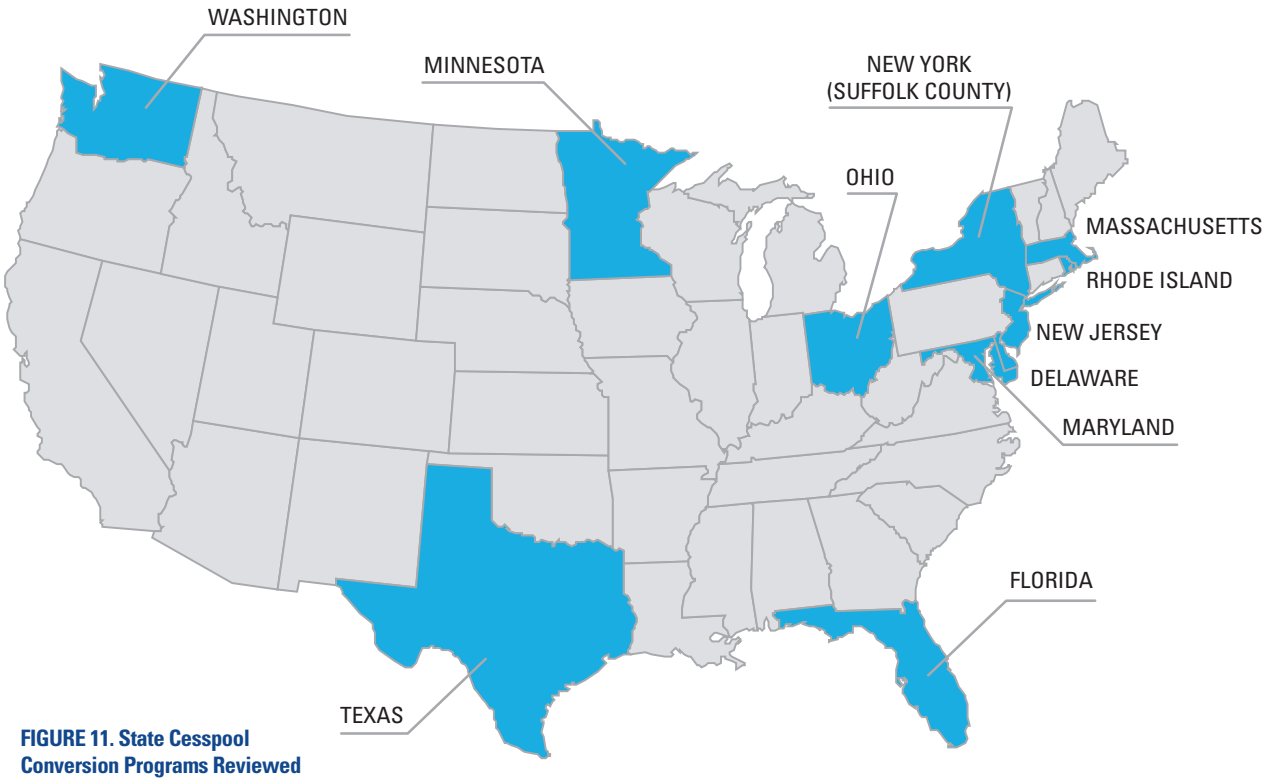


FIGURE 11. State Cesspool Conversion Programs Reviewed

Each state's cesspool conversion financing mechanism varies and is adapted to the individual state's demographics, technologies, and needs. However, there are lessons to be learned from each program as to what has worked and what has needed improvement. Some key takeaways from other states include:

Long-term Effort. The conversion process is a long-term effort that is generally slow moving. This requires all aspects of the program to be sustainable for an extended period of time (over 20 – 30 years), including but not limited to public outreach, funding, and administration.

Funding. Cesspool financing programs were funded through state funding, CWSRF, and the USEPA, with CWSRF funding being the primary source.

- Maryland's Bay Restoration Fund is unique in that they charge an annual user fee for onsite wastewater treatment systems and a monthly sewer connection fee to cover the program administration and grant costs.

Financing. Given the long implementation timeline, a suite of sustainable long-term financing mechanisms are required.

- While the financing programs of each state varied, most provided low interest loans to individual homeowners utilizing CWSRF or other state funds through a conduit/pass through mechanism. Utilizing this approach, the CWSRF programs funnel funding to individual homeowners through a "conduit" or intermediate agency which assumed responsibility for the loan and all administrative activities – thereby reducing administrative demands on the CWSRF program. Conduit agencies included other state programs, financial institutions or non-profit organizations.
- In addition to low interest loans, some states offer grants. New York, Maryland, and Rhode Island offer grants to individual homeowners, while Texas provides competitive grants to support applied research of onsite wastewater treatment systems.
- Massachusetts provides an ongoing tax credit program to cesspool homeowners if they convert/upgrade their cesspool.
- Washington provides a regional loan program (RPL) managed by Craft3 (a non-profit financial institution) to manage lending activities for onsite sewage system repair or replacement.

WASHINGTON'S REGIONAL ONSITE SEWAGE SYSTEM LOAN PROGRAM

- Partnership between state and local agencies and Craft3 (a non-profit third-part lender).
- Established in 1990.
- $15 million in CWSRF funding provided since establishment.
- Craft3 provides program management, approves or denies loan requests, and manages all loan disbursement and activity tracking.
- Craft3 assumes financial risk associated with lending and is obligated to repay the CWSRF funds.
- CWSRF loans provided to both residential and commerical owners to replace failing onsite sewage systems or to connect to existing sewer systems.
- 15-year loans with interest rates ranging from 1.99 to 4.99 percent dependent on household income.

Common Upgrade/Conversion Mechanisms. The most common upgrade and conversion mechanisms instituted by states were the requirements that the upgrade occur at the time of the property sale or property transfer, if the system failed during inspections, or as required by a blanket cesspool phase-out program (as is being implemented in Hawai'i).

Eligibility. Project costs eligible for financing included planning, design, implementation/construction, and permitting costs associated with converting failing or existing cesspool system or connecting to a sewer system. Additional financing eligibility requirements are as follows:

- Although there is no minimum income requirement, individual homeowners are required to have good standing credit and the loan must be secured by a mortgage lien or some other similar mechanism. Two programs provided alternative funding for applicants who could not qualify due to credit issues.
- Individual homeowners are required to secure approval of the proposed onsite system and design prior to start of construction in order to be eligible for financing. Approval was typically provided by the county or local permitting agency.

Homeowner Loans. Individual homeowner loans ranged from $1,000 to $35,000, with interest rates ranging from zero interest to low interest (3 to 6 percent), and loan periods ranging from 10-20 years or the useful life of the system.

- Several programs provided incentives for disadvantaged communities, low income households, or the elderly.
- There was no pre-payment penalty for programs reviewed.
- In several programs the homeowner was required to repay the loan upon sale or transfer of property.
- Loan repayment mechanisms included, but were not limited to: monthly payments, interest only/balloon payment, deferred payment, annual payment, and charge on property tax bill.

Disbursements. Most programs required construction to be completed prior to the disbursement of funds, therefore homeowners were required to pay the project costs upfront and then be reimbursed.

- Method of monetary disbursements varied, with most programs directly compensating the homeowner. In two programs, the states directly compensated the contractor for construction costs.
- Repayment mechanisms included monthly payments or annual line item in property tax bill.

Program Administration. Program administration efforts need to be covered with a sustainable financing mechanism.

- Most programs recovered administrative costs through the interest rate on the loan; while one state program utilized state funds to cover administrative costs.
- Several programs have established partnerships with non-profits, counties, or financial institutions to serve as a conduit agency responsible for administrative loan activities.

Public Outreach. States with successful programs had implemented extensive public outreach programs to educate residents on the public health and water quality benefits of converting cesspools and provided information on incentives and state programs homeowners could leverage to help cover the conversion cost.

As the Working Group develops a recommended approach to financing the cesspool conversions, its is recommended that discussions be conducted with various funding agencies as well as the lessons learned from other statewide mechanisms be investigated further, especially programs in New York, Washington, Maryland, and Massachusetts.

Other Factors Inhibiting Cesspool Conversions

Besides affordability and funding challenges, there are other obstacles to cesspool conversions in Hawai'i.

OVERVIEW AND OBJECTIVES

Previous discussion presented herein highlighted the affordability and funding challenges associated with the implementation of a program of this magnitude in the State. In this section, other factors which may inhibit the conversion of cesspools to a more appropriate technology and/or jeopardize the long-term success of the program are explored. In many cases, these factors were identified based on the experiences from conversion programs implemented in other states. Additional insight was gained from stakeholder input received as part of the Investigation of Cesspool Upgrade Alternatives in Upcountry Maui (Babcock et al, 2019).

PUBLIC ACCEPTANCE AND EDUCATION

Successful cesspool conversion programs implemented in other states have all included an aggressive public outreach and education effort. Getting homeowners to invest tens of thousands of dollars to upgrade their onsite system without a direct and visible benefit will be difficult. As a result, providing education and examples of tangible benefits such as reducing pollution and preserving sensitive ecosystems will be important for long-term success. Efforts should initially focus on public understanding and acceptance of the key underlying premise of the problem and the basis of area prioritizations. Subsequent and on-going outreach plans can be designed to inform the public of methods of conversion, available technical and financial resources, as well long-term operations, maintenance, and/or reporting requirements for onsite systems. Consideration should be given to the development of a centralized program-focused website along with other diverse methods of communication tailored to a public audience.

PERCEPTION OF INEQUITY

As presented previously, the cost of cesspool conversions can vary widely based on specific site conditions and level of treatment needed. In addition, it is expected that the cost of conversion to a more advanced onsite technology will generally exceed that paid by those currently connected to a county-owned wastewater collection system and treatment plant. These differences give rise to the potential perceptions of inequity between various homeowners within a given county or within the state as whole. Questions such as: Why should I pay more for sewer service than my neighbors?; Why should I have to pay more just because I don't have the good fortune to be connected to the county sewer system?; have been raised in previous stakeholder settings. Concerns have also been expressed that groundwater quality in some areas has been significantly impacted by legacy sources such as agriculture and that these past operations should also contribute their fair share to the solution of the problem. These issues of potential inequity should be clearly addressed to assist in gaining public acceptance and support.

NEAR-TERM INCENTIVES

Act 125 requires the conversion of all 88,000 in the State by 2050, or an average conversion rate of about 3,000 per year. Of the conversion programs evaluated in other states, most moved at a very slow pace, converting about 2,000 or less cesspools per year. Therefore, Hawai'i will to need to move at an aggressive pace compared to other states to meet the 2050 deadline required by the Act. Should the pace of near-term conversions lag, the task to convert all cesspools by 2050 becomes even more challenging. Development of an effective plan to identify and implement incentives to homeowners for complete conversions in the near-term would greatly assist in meeting program goals. The plan should consider the benefits of focusing incentives on the highest priority areas.

AVAILABLE WORKFORCE AND RESOURCES

It has been estimated that the overall conversion program will cost about $2 billion to implement. This represents an average annual cost of about $70 million. It is unknown if there is adequate qualified engineering, materials supply chains, and construction contractors currently available to meet program needs. If the number of conversions becomes more concentrated in the later part of the compliance period, workforce and resource concerns could dramatically increase. An assessment of available resources within the State should be performed to determine if this will be a factor which will inhibit cesspool conversions.

RESPONSIBLE MANAGEMENT ENTITY

Successful programs implemented by other states identified a single management entity to be responsible for obtaining, organizing, and managing the large amount of data required to assess ecosystem impacts, inventory and permit onsite systems, and conduct follow-up inspections and reporting. The role of this entity may also include the development of comprehensive regional or watershed management plans which outline strategies and implementation measures to insure compliance with water quality objectives through proper management, inspection, and regulatory enforcement. Without a single management entity, with a comprehensive long-term management approach, the overall effectiveness of the cesspool conversion program could suffer and ultimately negatively impact water quality improvement goals. This effort requires a source of significant ongoing funding for staff time and support services.

STABLE SOURCE OF REVENUE

Municipal water and wastewater programs rely on a stable source of revenue in the form of user fees or general taxing authority to fund system capital and on-going operations and maintenance (O&M) efforts. However, many major non-traditional projects, such as the cesspool conversion program, lack a reliable, dedicated revenue stream to cover the long-term costs associated with project implementation such as special financial assistance plans, data gathering, permitting, monitoring, regulatory enforcement, and general program administration. Consideration should be given to leveraging existing available and potential new revenue sources to assist with the financing of the conversion program. An example of such a program is the Bay Area Restoration Fund created by the State of Maryland which charges a fee of $2.50 to $5.00 per month to all municipal sewer customers and $60 per year to all those served by an onsite system. Resulting revenue is used to assist with the conversion of onsite systems, finance wastewater treatment plant upgrades, and cover on-going administrative costs.

Findings and Recommendations

As the State continues to develop the cesspool conversion strategy, there are several issues that warrant further investigation. This section summarizes findings, recommendations, and identifies the need for future studies and other early actions.

THE BURDEN OF AFFORDABILITY

Significant affordability challenges are anticipated for cesspool conversions across the State. It is projected that 97 percent of cesspool homeowners will pay more than 2 percent of their income for the conversions. As a result, there is likely to be a significant financial burden at the household level. Measures of poverty and income constraints show that most homeowners have little room in their household budgets for such a significant expense.

The affordability analysis breaks down the cesspools by priority levels and households with the greatest financial needs. Considering the limited potential funding available, homeowners with cesspools in priority areas and with the greatest financial need should be targeted.

THE FUNDING GAP

Because of the magnitude of the funding needs (an estimated total of about $2 billion), the State will likely need to develop a suite of funding sources to support cesspool conversions. While there are low interest loan and grant funding opportunities from federal, state, and local financing sources, the combination of these falls significantly short of what is required to fully fund all conversions. The example presented in Figure 12 illustrates that the potential funding gap could be as large as $1.1 billion given certain funding option assumptions.

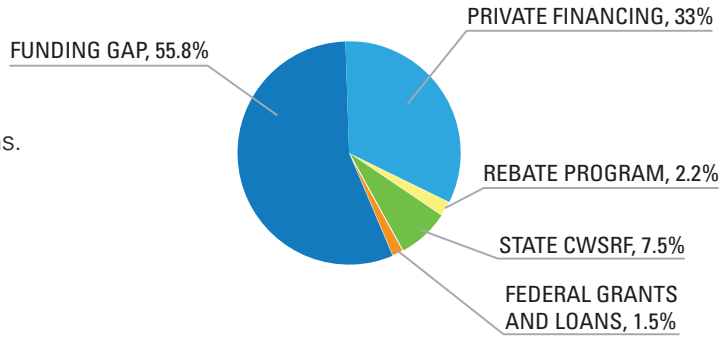


FIGURE 12. Hypothetical Distribution of Funding Sources and Potential Funding Gap.

DEFINING THE PIECES OF THE CESSPOOL CONVERSION "FUNDING PIE"

Figure 12 is a hypothetical financing scenario to estimate the remaining funding gap for cesspool conversions in Hawai'i.

ASSUMPTIONS:

- Total Conversion Cost: $2 billion
- Federal Grants/Loans: $30 million (@$1 million per year for 30 years)
- State CWSRF: $150M (@$5 million per year for 30 years)
- Rebate Program: $43 million ($10,000 rebate for those below the federal poverty level)
- Private Financing: $661 million (Based on households paying up to 2 percent of estimated monthly income)
- **Remaining Funding Gap: $1.1 billion**

RECOMMENDATIONS AND POTENTIAL NEXT STEPS

Recommendations and potential next steps to support cesspool conversions include:

Coordinate state legislative efforts to establish and facilitate a cesspool conversion program. Potential efforts include:

- Create a rebate program to incentivize conversions.
- Create legislation to require that cesspools are disclosed as part of real estate property inspections/ transactions.
- Evaluate legislation for establishment and funding of a cesspool conversion financing program.
- Evaluate potential federal legislative actions.

Identify viable financing mechanisms. Potential actions include:

- Conduct additional research into preferred options identified by the Working Group.
- Conduct outreach to federal and state funding programs to confirm applicability, program requirements, and timing.
- Follow-up with other states' financing programs to discuss program details to understand the "nuts and bolts" of the programs. Identify lessons learned, successes and failures, and what program elements could work in Hawai'i.

Identify administrative resources. Identify and contact potential agencies, non-profits, and financial institutions within the State to determine technical expertise, ability and willingness to conduct administrative activities, what financial mechanisms they could help implement, and other functions they can perform (e.g., technical support, permitting, etc).

FIGURE 13. Cesspool Upgrades.
Most homeowners will need significant financial support to upgrade their cesspools.

Coordinate with and leverage federal, state, and local entities. Conduct discussions with the following entities to assess and understand available resources (staff/financial), technical expertise, level of engagement/responsibility desired, and resource requirements:

- State
- Private lenders
- CWSRF Administrators
- U.S. Department of Housing and Urban Development
- U.S. Department of Agriculture
- USEPA
- Other identified agencies/non-profits

Determine distribution of financial aid. Distribution of financial aid should consider both the homeowner's ability to pay and the priority area of the cesspool to ensure funding is allocated to the highest needs.

Conduct public outreach. Work with the public outreach subgroup to establish comprehensive and extensive public outreach. Public outreach should be conducted to:

- Gain public understanding and acceptance of the key underlying issues and need for cesspool conversions.
- Inform the public of available conversion methods, technical information, financial resources, and long-term O&M and/or reporting requirements for their upgraded onsite wastewater system.
- Inform the public through various communication mediums including a program-focused website.

Overcome other factors inhibiting cesspool conversions. In addition to gaining public acceptance and educating cesspool owners through public outreach these include:

- Address perception of inequity. Clearly address these perceptions to gain public acceptance and support.
- Implement near-term incentives. Implement incentives that encourage homeowners to convert their cesspools in the near term, with a focus on homeowners within the highest priority areas.
- Identify available workforce resources and shortfalls. Assess available resources to implement the program (administration, engineering, construction, etc.) to determine if resource limitations will be an issue. If resources are limited, work to identify and/or develop additional workforce resources.
- Establish responsible management entity. Establish a single management entity to be responsible for comprehensive long-term implementation of the program so efforts are well coordinated and effective. Given this requires significant staff time and support services, identify an on-going source of funding for this entity.
- Establish stable source of revenue. Consider leveraging existing available and potential new revenue sources to provide a stable, long-term source of revenue to support the program.

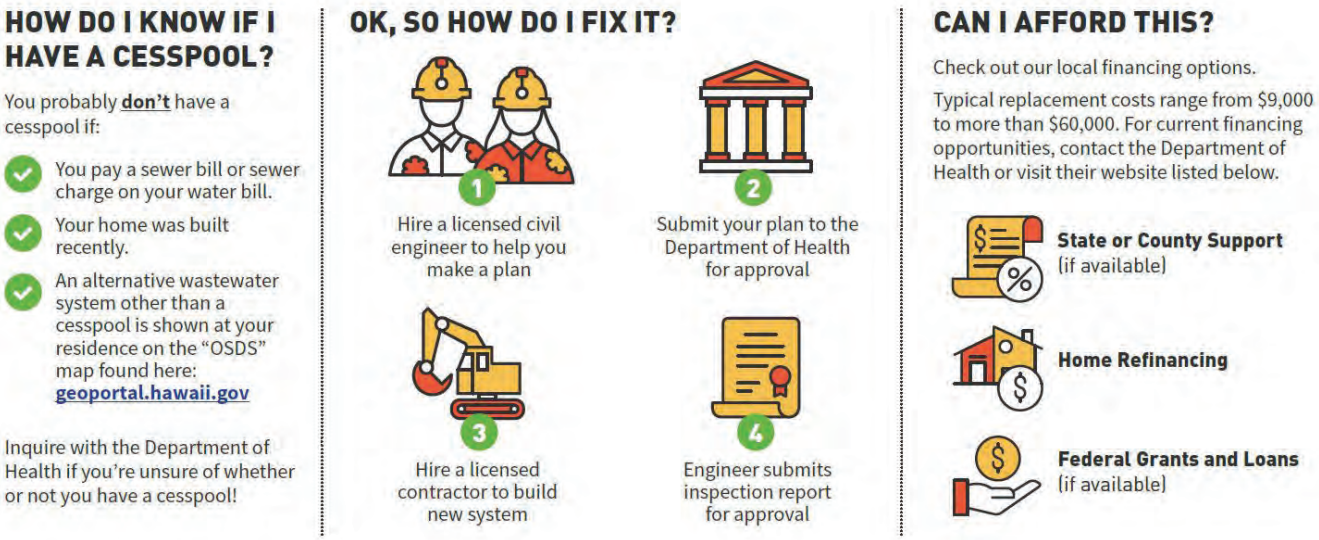


FIGURE 14. Example Public Outreach Handout
See Appendix C for the full page example handout.

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Appendix A

Technical Memorandum 1:
CESSPOOL CONVERSION FUNDING MECHANISMS
(October 2020)

Hawai'i State Department of Health
Cesspool Conversion Finance Research

Technical Memorandum 1
CESSPOOL CONVERSION FUNDING MECHANISMS

FINAL | August 2020

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Hawai‘i State Department of Health
Cesspool Conversion Finance Research

Technical Memorandum 1
CESSPOOL CONVERSION FUNDING MECHANISMS

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Abbreviations

AIE	alternative, innovative, or emerging
ATU	aerobic treatment unit
AWIA	America's Water Infrastructure Act
BMAP	Basin Management Action Plan
BRF	Bay Restoration Fund
Carollo	Carollo Engineers, Inc.
CCWG	Cesspool Conversion Working Group
CDBG	Community Development Block Grants
CFD	Community Facilities District
C-PACE	Commercial Property Assessed Clean Energy properties
CSSLP	State of Rhode Island Community Septic System Loan Program
CWCA	Clean Water Commerce Act
CWMP	Cooperative Watershed Management Program
CWSRF	State of Hawaiʻi Clean Water State Revolving Fund
DAC	disadvantaged community
DBEDT	Department of Business, Economic Development and Tourism
DBOM	design-build-operate-maintain
DCA	Department of Community Affairs
DEM	Rhode Island Department of Environmental Management
DEP	Department of Environmental Protection
DNREC	Delaware Department of Natural Resources and Environmental Control
DOE	Department of Energy
DOH	Department of Health
EDA	Department of Commerce Economic Development Administration
EFC	New York Environmental Facilities Corporation
EPA	United States Environmental Protection Agency
FFY	federal fiscal year
FHA	Federal Housing Administration
FSCAA	First State Community Action Agency
FY	fiscal year
GEM$	Green Energy Money $aver On-bill Program
GO	general obligation (bonds)
gpd	gallons per day
HCF	Hawaii Community Foundation
HELOC	home equity line of credit
HGIA	Hawaiʻi Green Infrastructure Authority
HRS	Hawaiʻi Revised Statutes

HUD	U.S. Department of Housing and Urban Development
Hui	Hanalei Watershed Hui
HVAC	heating, ventilation, and air conditioning systems
ID	Lono Kona Sewer Improvement District
LCC	large capacity cesspool
LDP	linked deposit program
LHD	Local Health District
LLP	Local Loan Program
MACOG	Missouri Association of Councils of Government
MDA	Maryland Department of Agriculture
MDE	Maryland Department of Environment
mgd	million gallons per day
MGP	New Jersey Municipal Grant Program
NEPA	National Environmental Policy Act
NJDEP	New Jersey Department of Environmental Protection
NJWB	New Jersey Water Bank
NPDES	National Pollutant Discharge Elimination System
NPS	nonpoint sources
OHA	Office of Hawaiian Affairs
OSWT	Onsite wastewater treatment
OSSF	on-site sewage facility
P3	Public-Private Partnership
PACE	Property Assessed Clean Energy
PAYGO	pay-as-you-go
PCA	Minnesota Pollution Control Agency
PFA	Minnesota Public Facilities Authority
PPL	Project Priority List
PRC	Polluted Runoff Control
Program	Septic Upgrade Incentive Program
RCAC	Hawai'i Rural Community Assistance Corporation
RI Housing	Rhode Island Housing and Mortgage Financing Corporation
RI-I	Rhode Island Infrastructure
RLF	Revolving Loan Funds
RLP	Regional On-site Sewage System Loan Program
R-PACE	Residential Property Assessed Clean Energy properties
RWLF	Rural Water Loan Fund
S.A.F.E.	Save, Accelerate, Fill and Expedite
SCADA	supervisory control and data acquisition
SEFO	Septic Extended Funding Option

SEP	Supplemental Environmental Project
SID	Special Improvement District
SRF	State Revolving Fund
SRLP	Septic Rehabilitation Loan Program
SSTS	Subsurface sewage treatment systems
STILF	Sewer Tie-in Loan Fund Program
TM01	Technical Memorandum 1
TM02	Technical Memorandum 2
TOGP	Texas On-site Sewage Facility Grant Program
Trust	New Jersey Environmental Infrastructure Trust
Ulupono	Ulupono Initiative
USBR	United States Department of Interior, Bureau of Reclamation
USDA	United States Department of Agriculture
VA	Veterans Affairs
WIFA	Water Infrastructure Finance Authority
WIFIA	Water Infrastructure Finance and Innovation Act
WIIN	Water Infrastructure Improvements for the Nation
WPCLF	Ohio Water Pollution Control Loan Fund
WQFA	Water Qualify Financing Administration
WQT	Maryland Water Quality Trading Program
WRRDA	2014 Water Resources Reform and Development Act
WRRSP	Ohio Water Resource Restoration Sponsor Program

Technical Memorandum 1

EXECUTIVE SUMMARY

ES.1 Introduction

Throughout Hawaiʻi, there are approximately 88,000 cesspools that release an estimated 53 million gallons per day (mgd) of wastewater to the environment. Most of the existing cesspools provide wastewater disposal for single-family residences, versus large-capacity systems serving multiple residences or commercial areas. Given that over 90 percent of the state's drinking water supplies are from groundwater sources, it was recognized that cesspools pose an environmental and public health risk.

In 2017, the Hawaiʻi State Legislature passed Act 125, which states that by January 1, 2050 all cesspools in the state, unless granted exemption, shall upgrade or convert to a septic or aerobic treatment unit (ATU), or connect to a sewer system (ACT 125, 2017). Act 132 was passed in 2018 to establish a Cesspool Conversion Working Group (CCWG) to develop a long range, comprehensive plan and commission a statewide study of sewage contamination in nearshore marine areas (ACT 132, 2018). The CCWG retained Carollo Engineers, Inc., (Carollo) to provide expertise on onsite wastewater treatment (OSWT) technologies and cesspool conversion funding and finance options.

As a result of Act 125, homeowners will be required to upgrade their existing cesspools to approved OSWT technologies. The cost associated with cesspool conversions will likely be a financial burden to most residential owners and in a state where the cost of living is already high, many homeowners will be challenged to afford the costs to upgrade. One of the complex challenges tasked to the CCWG is to develop a strategy to aid the funding and financing of the cesspool upgrades. The purpose of this technical memorandum (TM01) is to summarize potential funding mechanisms that may be available to provide financial support to homeowners. A subsequent technical memorandum (TM02) will evaluate affordability issues.

ES.2 Summary of Funding Mechanisms

There are several challenges associated with identifying viable funding mechanisms for Hawaiʻi's cesspool conversion program. First, and likely the most important, is the magnitude of the potential total amount of financing that the program may require. It is estimated that the total cost of the cesspool conversions within the state may range from $880 million to more than $5.3 billion[1]. While there are low interest loan and grant funding opportunities from federal, state, and local financing sources, all of these combined fall significantly short of that required to fully fund all conversions. In addition, most of the financing programs are available only to government entities such as the state or counties, or non-profit organizations, and are not targeted to private, residential property owners. This is further complicated by the fact that the state and the counties do not currently have the staff or the administrative capabilities to receive grant or loan funds, review and process individual applications, disperse the funds to homeowners, and, in the case of loans, conduct follow-up payment collection. Lastly, most of these financing programs provide a reimbursement for incurred cost,

[1] Historical cesspool replacement costs range from $9,000 to $60,000 per conversion. The range shown is for conversion of all 88,000 cesspools in Hawaiʻi.

requiring the individual homeowners to first pay upfront the cost associated with planning, design, and construction of the new OSWT system, and then be reimbursed.

Due to the varying demographics, socio economics, implementation timeline, and geographical terrain, there is not a "one size fits all solution" for both the conversion technology as well as the financing mechanism across all counties in Hawaiʻi. As a result, financing mechanisms implemented for the cesspool upgrades will need to:

1. Consider equitability and affordability issues.
2. Incentivize individual homeowners to convert existing cesspools.
3. Provide funding support for upfront cesspool conversion costs.
4. Consider the funding recipient.
5. Balance the need for immediate, near-, and long-term expenditures.
6. Potentially fund a variety of OSWT technology options.
7. Minimize the administrative burden on Department of Health (DOH) while providing support to existing or new local agencies.

Key to the successful implementation of the program will be to identify or develop a mechanism that can funnel federal and state funding or incentives to the individual homeowner through the DOH or other organizations, such as the counties, non-profits, or financial institutions. The financing program will necessitate additional funding for state and/or local government to administer the program and will likely consist of a mixture of funding options. This may include incentives (e.g. tax credits or rebates), existing federal and state grants/low interest loans, and/or the establishment of a state or county financing program (including funding legislation) targeted at individual cesspool conversions.

ES.2.1 Financing Options

Financing options may include tax credits or rebates, federal, state, or county grants, and private/mortgage loans. A notable difference between grants and loans are that grants do not need to be repaid, while loans are borrowed funds that need to be repaid, typically with interest. These financing options are summarized below.

ES.2.1.1 Private/Mortgage Loans

A subsequent TM will evaluate the relative affordability of cesspool conversions. It will be a challenge and likely infeasible for financial support to be provided to all cesspool owners. Thus, it will be necessary for homeowners to seek private or mortgage loans to pay for the cost of cesspool conversions. Given the economic turmoil caused by the global pandemic (COVID-19) in 2020, the current, low interest rates provided by private lending options may be an economical option for some residents.

ES.2.1.2 State Tax Credits or Rebate Programs

The state of Hawaiʻi's temporary tax credit program (Act 120), which provides up to $10,000 in incentives for individual homeowners to convert cesspools to septic systems or ATUs, is set to expire on December 31, 2020. Legislation which would extend the term of the credits did not pass in 2020. Given that only 47 applications have been filed for this credit to date, this incentive with its current structure, may have limited appeal and application and there may be a need to re-evaluate the tax credit mechanism to identify opportunities to make the program more enticing. A rebate program may have broader appeal and applicability for cesspool conversions.

ES.2.1.3 Grants and Loans

Federal, state, and local grant and loan funding sources should also be considered as potential funding mechanisms. While these sources do not provide a long-term solution for financing cesspool upgrades, they can help with the implementation of portions of the program. While most programs require a public entity or agency as the applicant, there are mechanisms by which money is secured by a public entity, non-profit, or financial institution who act as the broker to make sub-loans to individual homeowners for the cesspool upgrades. Funding agencies with potential financing mechanisms identified in this TM include:

- United States Environmental Protection Agency (EPA)
- United States Department of Interior, Bureau of Reclamation (USBR)
- United States Department of Agriculture (USDA)
- United States Department of Housing and Urban Development (HUD)
- United States Department of Commerce - Economic Development Administration (EDA)
- State of Hawaiʻi - Non-Point Source (319) (NPS) Grants
- State of Hawaiʻi Rural Community Assistance Corporation (RCAC)
- State of Hawaiʻi Rural Water Association
- Proposed – Hawaiʻi Cesspool Remediation and Conversion Loan Program

ES.2.1.4 Potential CWSRF Funding Mechanisms

There may be opportunities within the state of Hawaiʻi's Clean Water State Revolving Fund (CWSRF) program for non-profits or public entities to pursue funding or to create a pilot program to provide loans or grants to residential homeowners.

The CWSRF program provides low interest loans for a wide range of water quality infrastructure projects. Loans to finance non-point source projects can be provided through several funding mechanisms, depending on type of project, repayment source, and on agreement by the state program. Per statute, CWSRF funding can only be provided to public entities, however the state's CWSRF program can funnel funding to individual or private entities via the counties, other federal/state agencies, non-profits, or financial institutions. Typically, funding is provided by the state or the CWSRF program to a local intermediary agency that is then fiscally responsible for the loan and the overall loan administration, thereby reducing the burden on the CWSRF staff. Cesspool financing programs in other states, have been funded with CWSRF funds, EPA grants, state bonds, legislative funding or other state funding sources. Mechanisms that have been utilized successfully include: Conduit Lending (Pass Through), Linked Deposits, Sub-state Revolving Funding, and Direct Loans.

It is estimated that $5 million per year is the maximum financing that can currently be obtained through the CWSRF program. This level of funding represents less than 10 percent of the average annual cost of all conversions over the 30-year period.

ES.3 Lessons from Cesspools Funding Mechanisms in Other States

Cesspool conversion mechanisms used in ten other states were reviewed with the focus on those with programs funding the replacement of cesspools with OSWT systems. These states incentivized individual residential or commercial owners to convert failing systems by providing financial support to defray the

costs associated with the implementation of the new technology. Some key "lessons learned" from other programs include:

- Financial Programs:
  - Eight states have created robust financial programs which provide low to no interest loans and incentives to ease the high cost of upgrading cesspools to alternative, innovative, and emerging (AIE) technologies.
  - The states of New York, Maryland, and Rhode Island offer grants and low interest loans to individual homeowners.
  - Massachusetts provides an ongoing tax credit program as an incentive.
  - Texas provides competitive grants to support applied research of OSWT systems, which is funded from a fee collected for each permit issued.
  - In most states, homeowners are required to upgrade the OSWT system upon sale or property transfer.
- Funding Mechanisms for Cesspool Conversion Financing Programs:
  - Cesspool financing programs were funded through EPA, CWSRF or state funds, with CWSRF funding being the primary source.
    - The primary CWSRF mechanisms utilized to fund individual homeowner programs were Conduit Lending or Linked Deposits.
    - Most CWSRF programs utilize a pass-through entity (e.g. county, local governing body, financial institution or approved non-profit) to administer the loans from loan application to loan repayment.
    - The pass-through entity was ultimately responsible for the loan repayment to the CWSRF program but had mechanisms established to recover loans if there was a default.
  - Maryland's Bay Restoration Fund is unique in that they charge an annual user fee to OSWT systems and a monthly sewer connection fee to cover the program administration and grant costs.
- Program Administration:
  - Several programs have established partnerships with non-profits, counties, or financial institutions to serve as the conduit agency responsible for the administrative loan activities, thereby reducing the administrative burden on the states' CWSRF program.
  - The long timeline for program implementation also required that states establish a sustainable financing mechanism including sources and revenue streams to cover program administration and other costs. Most programs recovered costs through the interest rate on the loan; one program utilized state funds to cover the administrative costs of the program.
- Eligible Project Costs
  - Eligible project costs include converting failing or existing cesspool systems or connecting to sewer systems.
  - Eligible costs include planning, design, implementation/construction, and permit costs.
  - Funding was not applicable to new developments.
- Project Eligibility Criteria
  - All programs required that the applicant have good standing credit and that the loan be secured by a mortgage lien or some other similar mechanism. Two programs provided alternative funding for applicants who could not qualify due to credit issues.
  - Individual homeowners were required to secure approval of proposed AIE technology and design prior to start of construction in order to be eligible to receive financing. Approval was typically provided by the county or local permitting agency.

  - Most programs did not have an income requirement; however, several provided incentives for disadvantaged communities (DACs), low income households, or the elderly.
- Program Funding:
  - Individual homeowner loans ranged from $1,000 to $35,000.
  - Interest rates ranged from no interest loan to low interest (3-6 percent) to individual homeowners.
  - Loan periods ranged from 10-20 years or the useful life of the system.
  - There was no pre-payment penalty for any program.
  - In several programs the homeowner was required to repay the loan upon sale or transfer of property.
- Disbursements:
  - Key issues included the timing of disbursements as well as method of disbursement.
  - The majority of programs required construction to be completed prior to the disbursement of funds, therefore homeowners were required to pay the project costs upfront and then be reimbursed.
  - Method of monetary disbursements varied with most programs directly compensating the homeowner. In two programs, the states directly compensated the contractor for construction costs.
  - Repayment mechanisms included monthly payments or annual line item in property tax bill.

Each state's cesspool conversion financing mechanism varies and is adapted to the individual state's demographics, technologies, and needs. However, there are lessons to be learned from each program as to what has worked and what has needed improvement. As the CCWG develops its recommended approach to financing the program, it is recommended that further outreach be conducted and vetting of identified state-wide funding mechanisms - especially programs in the states of Delaware, New York (Suffolk County), Washington, Maryland, and Massachusetts.

ES.4 Other Funding Models and Partnerships

In addition to evaluating cesspool funding mechanisms in other states, models used by other infrastructure systems were reviewed and are summarized in the following sections.

ES.4.1 On-Bill Financing Program – Example: Hawai'i Green Infrastructure Authority

Two funding models utilized in Hawai'i are on-bill financing and on-bill repayment programs. On-bill financing allows the electric utility (e.g., Hawaiian Electric, Maui Electric, or Hawaiian Electric Light), to incur the cost of a clean energy upgrade to a home, which is then repaid by the homeowner through their monthly utility bill. Upfront capital is provided by a third party, not the electric utility. In some on-bill repayment programs, the loan is transferable to the next owner of the home, building, or property. The idea of an on-bill financing program could be adapted to finance cesspool conversions with the assistance of county or local agencies (e.g. water or wastewater utilities) that could assist in the billing administration function similar to electric utilities.

An on-bill financing model that currently exists in Hawai'i is the Green Energy Money $aver On-bill (GEM$) program whose purpose is to deploy clean infrastructure. The program enables ratepayers to finance clean energy improvements through an on-bill financing model that spreads the initial capital costs of installing green infrastructure of up to 20 years, thus providing an affordable way to invest in green infrastructure that will reduce monthly energy costs.

ES.4.2 Property Assessments – Example: Property Assessed Clean Energy Program

Another energy-based funding model that could be adapted to finance cesspool conversions is the Property Assessed Clean Energy (PACE) program. This is a mechanism used by local governments to allow property owners to finance the up-front cost of energy efficiency and renewable energy improvements (such as solar) and then pay the costs back over time through a voluntary assessment. A PACE program could be modified as a viable financing option for cesspool conversion to allow a property owner to pay back the costs of their cesspool remediation over time at an agreed upon interest rate and length of loan term. Funding would occur through private lenders, e.g., private banks, or the issuance of municipal bonds.

ES.4.3 Property Assessments – Example: Community Facilities District and Special Improvement Districts

The use of Community Facilities Districts (CFDs) or Special Improvement Districts (SIDs), which are independent, local special-purpose financing districts that levy taxes and assessments and issue bonds to provide infrastructure to develop communities of all types, could be another mechanism by which to fund cesspool conversions. An improvement district specifically created to address the EPA's requirement to close large-capacity cesspools is the Lono Kona Sewer Improvement District (ID) in North Kona in the County of Hawaiʻi. This ID funds the connection of 110 parcels to the county wastewater system. A similar funding mechanism could be applied to the funding of on-site treatment systems for a subdivision of current cesspool owners.

ES.4.4 Public Private Partnerships

Another potential funding mechanism is the development of Public-Private Partnerships (P3s) that encourage private investment in public infrastructure projects. P3s are contractual arrangements in which governments or public entities form partnerships with the private sector to design, finance, build, and operate and/or maintain infrastructure such as toll roads, water supply facilities, and wastewater treatment plants. Public agencies are in charge of financing and theoretically pass all the risks related to operating costs and project revenues to the private partner. However, P3s also have some negatives including local opposition,, loss of public control and flexibility, potential need for in-house expertise or outside consultants, complicated contracts and complex negotiations, as well as significant effort to enforce and monitor contracts.

ES.5 Legislative Efforts

Legislative efforts, both at the state and county levels, may help to address cesspool conversion funding options. Political coordination on legislative efforts would help provide consistent and clear messaging to stakeholders and decision makers. This will be particularly important with economic recovery plans during and following the COVID-19 pandemic.

ES.6 Recommendations and Next Steps

Financing options for the cesspool conversions to approved OSWT systems will likely be comprised of a hybrid of financing options depending on several factors including: affordability, overall cesspool identification and prioritization, cost of preferred technologies, funding recipient (individual versus a subdivision versus homeowners' association), financing sources/restrictions, available staffing resources, stakeholder feedback, and other factors that still need to be identified and assessed.

Identification of stable revenue sources will be helpful to fund the cesspool conversion program. Potential revenue sources may include:

- Developer fees.

- Nutrient impact fees.
- Permit fees.
- Property taxes.
- Recreational or license fees.
- Resort taxes/fees.
- General excise tax.
- Special assessments.
- User fees.

The next steps in the initial evaluation of potential funding mechanisms that are within the scope of this study includes:

1. Evaluate affordability issues as well as the equitable distribution of funds (TM02).
2. Present funding options to DOH to solicit input, identify preliminary list of preferred financing mechanism, and identify considerations/concerns.

Recommendations and potential next steps to support cesspool conversions include:

1. Coordination of legislative efforts, such as:
   a. Extension of Act 120 tax credits beyond 2020 or creation of a potential rebate program.
   b. Creation of legislation to require that cesspools are disclosed as part of real estate property inspections/transactions.
   c. Evaluation of legislation for establishment and funding of a cesspool conversion financing program.
   d. Evaluation of potential federal legislative actions.
2. Work towards the identification of potential viable financial mechanism through the following actions:
   a. Conduct additional research into preferred options identified by the CCWG.
   b. Outreach to federal and state funding programs to confirm applicability and program requirements, timing, etc.
   c. Follow-up with financing programs to discuss program details to understand the "nuts and bolts" of the programs. As well as identify lessons learned, successes and failures, and what program elements could work in Hawai'i.
3. Identify and contact potential agencies, non-profits and financial institutions within the state to determine technical expertise, ability and willingness to conduct administrative activities, what financial mechanisms they could help implement, and other functions they can perform.
4. Conduct discussions with DOH, private lenders, CWSRF, counties, HUD, USDA, and other identified agencies/non-profits to assess and understand available resources (staff/financial), technical expertise, level of engagement/responsibility desired, and resource requirements.
5. Link preferred funding options to affordability and equitability distribution considerations to provide a complete picture of options and affordability mitigation measures.
6. Work with public outreach subgroup to develop strategies for presenting technology and financing options to groups of affected cesspool owners to solicit input.

Technical Memorandum 1

CESSPOOL CONVERSION FUNDING MECHANISMS

1.1 Introduction & Background

The 2004 *Clean Watersheds Needs Survey Report to Congress* found that in the state of Hawaiʻi, 62 percent of the residents are served by centralized wastewater treatment facilities and the remaining 38 percent are served by decentralized or OSWT systems. There are approximately 110,000 OSWT systems, including 88,000 cesspools and over 21,000 septic systems in Hawaiʻi. A cesspool is defined by the EPA as an underground excavation that receives sanitary wastewater from bathrooms, kitchens, and washers. Cesspools are not designed to treat wastewater but rather capture solids. The structure usually has an open bottom and perforated sides. Domestic wastewater flows into the structure and the solid waste collects at the bottom and the liquid waste flows out to percolate into the subsurface that may be hydraulically connected to groundwater and surface water.

The majority of the cesspools in Hawaiʻi serve single-family, residential units and are spread out throughout the islands. Table 1.1 summarizes the estimated number of cesspools by island, as well as the estimated total wastewater discharge. Of these, 43,000 cesspools have been identified as posing a risk to the state's water resources of which 31,000 are located within the perennial watersheds on the islands of Hawaiʻi, Kauaʻi, Maui, and Molokaʻi.

Table 1.1 Estimate of Cesspools and Total Anticipated Discharge by Island(1)

Island	Housing Units	Number of Cesspools	Cesspool Effluent (mgd)
Hawaiʻi	82,000	49,300	27.3
Kauaʻi	29,800	13,700	9.5
Maui	65,200	12,200	7.9
Oʻahu	336,900	11,300	7.5
Molokaʻi	3,700	1,400	0.8
Total	**517,600**	**87,900**	**53.0**

Notes:
(1) Confirmation of the actual number of cesspools, locations, and priorities is being conducted under a separate task of the CCWG.

In total, these cesspools are estimated to discharge 53 mgd of untreated sewage to the groundwater system and coastal waters. Untreated wastewater from cesspools contain nutrients (nitrogen and phosphorous) and pathogens such as bacteria, protozoa and viruses which can have an impact on the quality of drinking water, general water quality, the health of the state's reefs and the health of Hawaiʻi's residents and visitors.

To incentivize "early adopter" cesspool conversion, the state of Hawaiʻi established a temporary tax credit program in 2016 (Act 120). Act 120 provided a $10,000 tax credit to homeowners for the upgrade of qualifying cesspools and is set to expire on December 31, 2020.

In 2017, the Hawaiʻi State Legislature passed Act 125, which states that by January 1, 2050 all cesspools in the state of Hawaiʻi, unless granted exemption, shall upgrade or convert to a septic system or aerobic treatment unit, or connect to a sewer system (ACT 125, 2017).

Act 132 was then passed in 2018 to establish the CCWG to develop a long range, comprehensive plan and commission a statewide study of sewage contamination in nearshore marine areas (ACT 132, 2018). Act 132 directed the DOH to evaluate residential cesspools in the state, develop a report to the legislature that includes a prioritization method for cesspool upgrades, and work with the Department of Taxation on possible funding mechanisms to reduce the financial burden on homeowners. The CCWG retained Carollo to provide expertise on OSWT technologies and cesspool conversion funding and finance options.

As a result of Act 125, homeowners will be required to upgrade their existing cesspools to more appropriate technologies. The CCWG recognized that the cost associated with the conversion of these onsite sewage disposal systems will be a significant financial burden to individual residential owners. One of the complex challenges tasked to the CCWG is to develop a strategy to aid the funding and financing of the cesspool upgrades.

Figure 1.1 shows a stepwise approach to guiding homeowners with cesspools through the conversion process. The CCWG and key advisors are developing the overall strategy to the cesspool conversion program, including public outreach, treatment technologies, data validation and prioritization, and finance research. The information on funding mechanisms provided in this TM is to support step #5 shown in Figure 1.1. However, there is a significant amount of strategy, planning, and coordination that will be completed by the CCWG and other over the next few years.

Figure 1.1 Stepwise Approach to Cesspool Conversions for Homeowners

It is estimated that the cost to convert a cesspool to an OSWT system (e.g. septic system or identified AIE technologies) ranges widely from $9,000 to $60,000 or more depending on system capacity, technology, location and size of dwelling unit–a cost that many homeowners cannot afford (Babcock, 2019). With 88,000 cesspools requiring upgrades, total upgrade costs could range between $880 million to more than $5.3 billion[2].

While there are low interest loan and grant funding opportunities from federal, state, and local financing sources, all of these sources combined fall significantly short of that required to fully fund all conversions. In addition, most of the financing programs are available only to government entities, such as state agencies or counties, and are not targeted to private, residential property owners. This is further complicated by the fact that state agencies and the counties do not currently have the staff or the administrative capabilities to receive grant or loan funds, review and process individual applications, disperse the funds to the homeowners, and, in the case of loans, conduct follow-up payment collection.

Motivating residents to implement the conversion of existing cesspools will be challenging. Despite the benefits of improving public health and the environment and the state mandates contained in Act 125, there are few financial incentives for homeowners to convert or upgrade their systems. The cost of cesspools is

[2] Historical cesspool replacement costs range from $9,000 to $60,000 per conversion. The range shown is for conversion of all 88,000 cesspools in Hawai'i.

low and there are minimal maintenance requirements. A major challenge to the successful conversion of the state's cesspools is the identification of individual residential incentives, as well as the identification of a funding mechanisms for the financing of both the capital expenditures and the long-term costs associated with the maintenance and management of OSWT systems and overall program administration. In addition to financial incentives, there is a need to identify and quantify the benefits (e.g. economic, environmental, water quality, etc.) to be gained from converting cesspools that can be communicated to individual homeowners to further incentivize the homeowners to convert.

1.1.1 Method of Cesspool Conversion and Funding Needs

There are generally three options for cesspool conversions including:

- **Connection to existing or new centralized sewer systems.** In the large municipal areas of Hawai'i, homes and businesses are connected to county or privately owned, sewer collection and treatment systems, where the wastewater flows to a centralized treatment facility for treatment and disposal. Centralized sewer collection and treatment systems are generally cost efficient because of economies of scale, treating the water either for discharge or for water reuse applications (e.g., golf course irrigation). However, there are significant capital investments required by counties or private developers, and connections to centralized systems may not be feasible for many cesspool conversions.
- **Connection to decentralized sewer systems.** Decentralized sewer systems (also "cluster" wastewater systems) are similar to centralized sewer systems, but typically have a smaller collection system service area and wastewater treatment facility. Decentralized treatment can range from passive treatment with soil dispersal to more sophisticated, mechanical treatment, such as membrane bioreactors. Within the rural portions of Hawai'i, which are extensive, the costs to excavate and construct long sewer systems from remote locations to a centralized treatment facility are substantial.
- **Conversion of cesspools to approved OSWT and disposal systems.** A 1999 survey conducted by DOH showed that approximately 19 percent of the households in Hawai'i had OSWT and disposal systems, including cesspools. Since many of the cesspools are located in rural areas without centralized wastewater systems, conversion to OSWT and disposal may be the most cost-effective option for some homeowners.

The focus of both the technology and finance research efforts are on technology and finance options for OSWT systems. Thus, this TM is focused on identifying funding mechanisms assuming existing cesspools will be upgraded to OSWT systems.

1.1.2 Purpose

The magnitude of the potential total amount of financing required for the conversions is a challenge and likely infeasible for financial support to be provided to all cesspool owners. The cost to convert all 88,000 cesspools by 2050 will require a consortium of financing solutions including self-financing, state and county incentives, individual loans from financial institutions, federal, state and local financing sources, and potentially establishing a cesspool financing program.

Federal, state, and local financing options, such as grants and low-interest loans were identified as a potential source of financing, however these programs are limited in their funding capacity, with program funding allocated amongst a variety of project types. There are other challenges for these programs including funding program purpose/priority which may limit the programs ability to fund cesspool conversions, other demands/needs on the program, the requirement for repayment, and most require a

public entity be the recipient of the funding and are not targeted to private, residential property owners. Lastly, most of these financing programs provide a reimbursement for incurred cost, requiring the individual homeowners to first pay upfront the cost associated with planning, design, and construction of the approved OSWT system, and then being reimbursed.

The establishment of financing programs requires staff or the administrative capabilities to receive grant or loan funds, review and process individual applications, disperse the funds to homeowners, ensure implementation of projects and, in the case of loans, conduct follow-up payment collection. With a clearer understanding of the economic impacts to convert 88,000 cesspools, identification of responsibilities, and the affordability of these conversions, the CCWG should consider further the establishment of a financing program to incentivize homeowners to convert their system (e.g. financial assistance for planning, design and construction). The funding program must:

1. Be sustainable and address the required governance structure/institutional requirements.
2. Identify and provide mechanisms to fund the program (e.g. CWSRF, EPA, bonds, governmental bill, fees, etc.).
3. Provide equitable distribution of financing to homeowners considering priority, income level, etc.
4. Outline administrative requirements (e.g. DOH, county, other agency or a hybrid) governance, and financing provided.

Other states with similar mandates to convert cesspools have implemented programs with varying degrees of success. Successful implementation of these programs has required agency partnerships, participation of local cities/counties/other government entities to support program implementation/oversight, and allocation of dedicated funding sources. Where staffing resources are limited, some states have partnered with outside lending institutions for overall program administration, however, the interest rates are typically much higher. These financing programs are often complemented with other sources of funding including state incentives, other program financing, and individual resident financing.

The focus of this effort is on identifying potential funding sources and financing mechanisms that are available to private, residential OSWTs. There may be additional source of funding for centralized options or options sponsored by public entities. Funding options to connect to a county or private wastewater system are not included in the scope of this TM. However, a summary of traditional funding mechanisms typically applied to decentralized or centralized sewer options is provided in the following section. Other treatment options will have differing financing mechanisms due to the nature of the borrower, especially if it is a public entity. One of the major challenges in financing the conversion of cesspools will be balancing affordability impacts. The topic of affordability will be explored in a separate, forthcoming technical memorandum (TM02).

This TM also provides an assessment of financial mechanisms used in other states for the funding of cesspool conversion projects; summarizes potential federal and state funding programs, including state of Hawai'i funding options, that could be utilized to pay for cesspool conversions; provides a summary of recommendations; and identifies potential next steps.

1.2 Traditional Funding Mechanisms

There are two types of costs associated with cesspool conversions: 1) capital costs required to plan, design, and convert the cesspool to an OSWT system; and 2) re-occurring operational costs required to maintain, operate, and repair the new OSWT system. For projects that connect to centralized systems or decentralized systems, capital costs for the cesspool connection to a sewer or a decentralized system may be funded through a variety of sources that range from traditional funding options, such as revenues from internal user

charges and bond financing, to non-traditional funding sources such as grants, low interest loans, and market-based programs. Operating revenues remaining after operating expenses and debt service obligations have been met can be a significant source of funding for capital expenses or placed in reserves for future projects. In addition, operation and maintenance costs are typically funded through user rates and other recurring annual sources of revenue. Mechanisms available to public utilities include:

- **Pay-as-you-go (PAYGO) financing —** Depending on an agency's existing capital reserves, it can potentially build up its financial capacity to fund expenditures in peak users. Funds are raised through upfront payment of project costs from revenues of existing and new users for future capital improvement projects. It is common for utilities to fund major capital expansions through other methods, particularly bond financing, to avoid the burden that PAYGO's high upfront cash requirement places on rate or reserve funds.
- **Debt financing —** acquisition of funds through borrowing mechanisms (e.g. debt issuance) which enable an agency to lessen the rate payer's upfront burden.
- **Grants and loans —** alternate sources of funds from public agencies at no or minimal interest cost. Examples include federal, state, and local programs that provide funding at zero interest for projects that meet select criteria.
- **Other Mechanisms —** refers to financing through funds obtained from tax credits, purchase agreements, voluntary programs, and trading and offset programs.

Appendix A includes a discussion of each of these mechanisms that traditionally fund centralized or decentralized wastewater treatment systems. Most of these traditional funding mechanisms cannot be used to finance individual residential conversion of cesspools to new OSWT and disposal systems for a variety of reasons including: project fit; eligibility of funding recipient (pubic vs private entity); lack of a dedicated revenue stream; administrative challenges; and state restrictions. However, two traditional mechanisms may potentially be applicable for OSWT systems include: 1) assessment district bonds (if an assessment district can be formed); and 2) federal and state grants and low interest loans (if a mechanism to funnel monies to individual homeowners is established).

1.3 Private Financing Options

It will be a challenge and likely infeasible for financial support to be provided to all cesspool owners for the conversions. Thus, it may be necessary for homeowners to seek private or mortgage loans to pay for the cost of cesspool conversions. There are several private financing options available to homeowners including: personal loans, home equity loans, or the use of personal savings. Given the economic turmoil caused by the global pandemic (COVID-19) in 2020, the current, low interest rates provided by private lending options may be an economical finance mechanism for some cesspool owners. Figure 1.2 shows the historical 30-year fixed rate mortgage interest rate in the United States from April 2, 1971 through July 2, 2020. The lowest interest rate on record is 3.07 percent as of July 2, 2020[3]. The gray shaded areas of the graph indicate U.S. recessions with the latest due to COVID-19. If mortgage rates remain relatively low (in the 3-4 percent range), private loan options are well within the low interest loan (0-6 percent) range of other financing options discussed later in this TM. As there is an increase in private financing options for cesspool conversions, financial institutions may consider developing a specific financing plan for conversions as well as a streamlined application process, as seen with the solar programs. Given the number of cesspools to be converted, financial institutions will need to consider the fiscal ability, as well as staffing needed to issue and manage private loans.

[3] https://fred.stlouisfed.org/series/MORTGAGE30US

Table 1.2 is a summary of the different types of private/mortgage loans that may be used by homeowners to finance their cesspool upgrade costs. The maximum loan amounts and interest rates are subject to change.

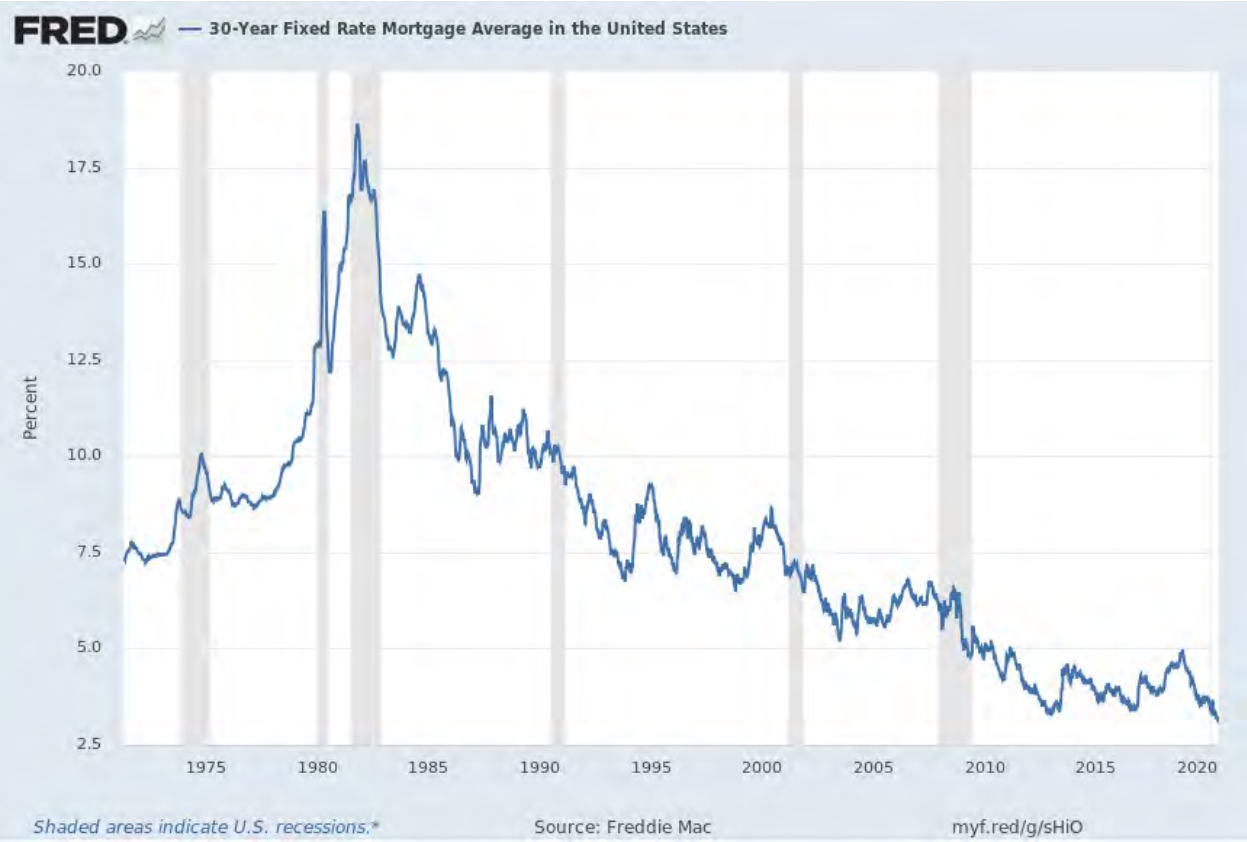

Figure 1.2 30-Year Fixed Rate Mortgage Average in the United States

Table 1.2 Summary of Private Lending Options

Loan Product	Borrowing Power	Notes
Federal Housing Administration (FHA) 203b – Cash out Refinance	Refinance Loan to Value 85%	Rates range from 3.25% - 4.0%
FHA 203K – Rehabilitation	Finance up to $35,000 in Home Rehabilitation	Rates range from 3.25% - 4.0%
FHA 247 – Cash out Refinance Hawaiian Homelands	Up to 85% with documented proposals for work	Rates range from 3.25% - 4.0%
U.S. Department of Housing and Urban Development (HUD) 184a – Cash out Refinance Hawaiian Homelands	Up to 85% no documentation required for proposed work	Rates range from 3.25% - 4.0%
RD- Refinance for Site Work	Restrictions such as income, County lending limits, and type of refinance	Rates range from 3.375% - 4.125%
Veterans Affairs (VA) – Cash out Refinance	Up to 100% of the value	Rates range from 3.25% - 4.0%

Loan Product	Borrowing Power	Notes
Fannie Mae/Freddie Mac – Conventional Cash out Refinance	Up to 80% of the value	Rates range from 3.50% - 4.25%
Lender's Portfolio Cash out Refinance	Up to 80% of the value	Rates range from 3.75% - 4.50%
Home Equity Line of Credit	Up to 85% of the value if a first mortgage is in place. Line Size varies	Interest only for a fixed period of 10 or 15 years with Introductory Rate offered for 2, 3, or 4 years. Rates range from 2.70% - 3.85% for the Introductory Period
Home Equity Loan	Up to 85% of the value if a first mortgage is in place. Line Size varies	Fixed Rate Loan Option Rate 4.50%
Personal Unsecured Loan	Amounts vary depending on Institutions offerings. $35,000 average loan size	Payment depends on Term 36 months with Rates ranging from 7.0% - 14.0% depending upon Credit Score
Personal Flex	Varies by Institution with Line Sizes up to $30,000	Rates range from 11.0% -14.0%
401K Loan	$30,000 - $50,000 with repayment being auto deducted from employee's payroll	Rates range from 4.25% - 5.25% with Loan Terms up to 5 years

1.4 Cesspool Funding Mechanisms in Other States

A review was conducted of funding mechanisms that have been successfully utilized in other states facing similar issues. The ten state programs reviewed were selected based on work previously authorized by the CCWG, identified program successes, as well as in coordination with the Cesspool Conversion Technologies Research. Information was gathered from publicly available, online resources for each state. While each state evaluated maintains websites with pertinent information, it is possible that some information is out of date.

Appendix B includes a discussion of each of the ten states and their funding programs. Table 1.3 summarizes the highlights of the cesspool conversion funding mechanisms of six of these states.

Table 1.3 Summary of State Programs

Program Feature	Delaware	Washington	Rhode Island	New York	Maryland	Massachusetts
Funding Mechanism	Direct Lending	Conduit Lending/Pass Through	Sub-State Revolving Loan	Conduit Lending/Pass Through	Credit and Linked Deposit	Pass Through Lending, Direct Loans and Tax Credits
Type of Financing Assistance Provided	Low Interest Loan	Low-Interest Loan	Low Interest Loans	Grant	Grants and Low Interest Loans	Low interest loans and Tax Credits
Funding Program(s)	• Septic Rehabilitation Loan Program (SRLP) • Septic Extended Funding Option (SEFO) (*if denied SRLP*)	• Local Loan Program (LLP) • Regional On-site Sewage System Loan Program (RLP)	• Community Septic System Loan Program (CSSLP) • Sewer Tie-in Loan Fund (STILF) • (0% interest loans for local sewer connection)	• Septic System Replacement Fund • Counties may have additional programs (e.g. Suffolk County provides an additional grant of $20,000 and low interest loans)	• Bay Restoration Fund (BRF) – Grant • Linked Deposit Program (LDP) – low interest loan	• Community Septic Management Program • Homeowner Septic Loan Program • Tax Credits
Funding Priority/Purpose	<u>Both Programs:</u> Repair or Replace of privately-owned decentralized wastewater treatment systems	• LLP: Repair or replace failing onsite sewage systems • RLP: Abandon septic and connect to sewer	<u>Both Programs:</u> Repair or replacement of substandard or failing septic systems or to replace cesspools with septic systems	Replacement of cesspool with a septic system; installation/ replacement/upgrade of a septic system; or installation of enhanced treatment technologies.	• BRF – WWTP Upgrades to the best available technology for nitrogen removal or to connect to existing public sewer • LDP – Low interest loans for capital improvements to reduce nutrient delivery to the Chesapeake Bay	• Community Septic Management Program Repair, replacement, or upgrade of failed septic systems or the connection to an existing sewer • Homeowner Septic Loan Program Home septic system repairs. • Tax Credits: Septic systems and cesspool upgrades and repairs after January 1997
Funding Source	• Both Programs: – CWSRF Funds – CWSRF Allocation (1% fee charged on CWSRF loans)	• Both Programs: – CWSRF (loan financing) – Centennial Clean Water Fund (administrative costs/loan losses and grants)	Rhode Island Infrastructure Bank (RI Bank) utilizes funds from recycled CWSRF loans	State of New York's State's Clean Water Infrastructure Act 2017 *(including $75 million for Septic System Replacement Fund)*	• BRF – Dedicated fund from Municipal Fees ($2.50 or $5/month); User Fees for OSWT ($60 annual fee) • LDP – Maryland DEP	• Community Septic Management Program CWSRF offers 0% interest via MA Water Pollution Abatement Trust. Trust then provides $5 million a year to municipalities • Homeowner Septic Loan Program Massachusetts DEP
Financial Responsibility	Department of Natural Resources and Environmental Control	• LLP: Program: County serves as Pass Through Entity • RLP: Craft 3	Municipal Agencies apply for a Lending Facility from the RI bank from which to make direct loans to homeowners	New York Environmental Facilities Corporation (EFC) provides funding to Counties/County Health Departments	LDP: Maryland DEP provides participating lender a below-market rate of interest agreement	• Community Septic Management Program Communities are responsible for loans • Homeowner Septic Loan Program Massachusetts DEP
Fund Administrator	First State Community Action Agency	• LLP: County or Local Health Department • RLP: Craft3	Rhode Island Housing and Mortgage Financing Corporation (RI Housing).	Counties/County Health Departments	• BRF: Maryland Water Quality Financing Administration • LDP: Financing Lender executes loans with individual entities and are responsible for administration of program including risk of default	• Community Septic Management Program Local board of Health to local homeowners through Betterment Agreement • Homeowner Septic Loan Program Massachusetts Housing Program

Program Feature	Delaware	Washington	Rhode Island	New York	Maryland	Massachusetts
Amount of Funding	• $1,000 to $35,000 (homeowner) • $250,000 (mobile home parks)	Loan can cover full cost of the conversion project	Maximum of $25,000	50% of cost or maximum of $10,000 per resident	• BRF: Grant of up to $20,000 per household • LDP: Pending financial institution	• Community Septic Management Program – $200,000 to communities to develop Community Inspection Plan/Septic Management Plan – $20,000 grant to first time communities for administrative costs • Homeowner Septic Loan Program $1,000 to $25,000 • Tax Credits: Commonwealth provides a tax credit of up to $6000 over 4 years
Eligibility Requirements	• Residential Owners • Low to moderate income households • Good financial standing/credit (no judgements, collections or serious delinquencies) • Not in bankruptcy • Debt: Income ratio greater than or equal to 41% • New construction on vacant lots are not eligible	• Residential and Commercial owners • New construction on vacant lots are not eligible	• Residential Owners and Non-owner Occupants – Prerequisite: – Approved On-Site Wastewater Management Plan – Municipality is on Project Priority List – Certificate of Approval • Debt: Income ratio greater than or equal to 45% • New construction on vacant lots are not eligible	• Located in participating county/ within a priority geographic area. • Single family, two family and small businesses (design sewage flow < 1,000 gallons per day (gpd) and seasonal or secondary homes may be eligible. • Cannot have any outstanding or open real property tax liens. • New construction on vacant lots are not eligible	• Residential Owners • Credit worthiness of application per lenders underwriting criterion. • New construction on vacant lots are not eligible	• Community Septic Management Program Project on a community's priority list – Prioritized based on environmental/public health impacts, income and funding needs. • Homeowner Septic Loan Program Residential owner with up to 4 family homes
Secured by	Mortgage lien on property	Upon transfer or sale of property, loan to be repaid or transferred to new owner.	Mortgage lien on property	N/A	Bank assumes all risk of default/State and MDE is not liable to reimburse bank for loses or expenses associated with program	• Betterment Agreement with homeowner • Municipal lien on property if default

Program Feature	Delaware	Washington	Rhode Island	New York	Maryland	Massachusetts
Financial Loan Terms	• SRLP: • 20 years loan term • Interest ranges 3%-6% (based on income) • SEFO • 20-year loan • 0% interest rate • No monthly payments.	• 15-year loan term • Interest rate 1.99%-4.99% • Payment options include: No monthly payment, monthly interest only or monthly principal plus interest (based on income and occupancy)	• 10-year loan term • $300 loan origination fee • 1% annual serving fee on outstanding balance	• Grants provided on a reimbursement basis • Property owners are initially responsible for the total cost of their septic system project.	• BRF: – Grants provided on a reimbursement basis – Property owners are initially responsible for the total cost of their septic system project. • LDP: – Terms based on financial lending agency requirements. – Lending institution passes the below-market rate of interest to the borrower; may add fees to cover costs	• Community Septic Management Program – Interest rate ranges between 3% -5% based on affordability – 15-20-year loan term – Repaid through the Community's tax collection (property tax bill line item) – If the property is sold, the payments is assumable by the buyer of a property. • Homeowner Septic Loan Program – 3-20-year loan – Interest rates between 3%-5% based on family size, income and market area. – Min. monthly payment is $27 – Due in full upon sale, transfer or refinancing of the first mortgage
Pre-Payment Penalty	No	No	No	No	No	No
Reimbursement Program	Yes	Yes	Yes	Yes	Yes	Yes
Eligible Costs	Site evaluations, design, permits, impact and connection fees, electrical construction costs, abandonment of septic systems and closing/ recording costs.	Design, permitting, installation of new septic system, maintenance and reserve for ongoing inspections and repairs.	Engineering and system replacement costs	Engineering, construction and system costs	Capital facility, user connection, master plumbing charges, and the purchase of cost-effective nitrogen, phosphorus, or sediment loading reductions	Engineering, Construction and System Costs
Income Requirement	Moderate to low income homeowners,	• No income restrictions • Favorable rates/terms for lower income households	No income restrictions	No income restrictions	• BRF: No income restrictions • LDP: No income restrictions	• Community Septic Management Program No income restrictions • Homeowner Septic Loan Program No income restrictions

1.4.1 Summary/Findings

Recognizing that many residents could not afford to pay for the cost associated with the conversion of individual cesspools, other states have established financing mechanisms to incentivize residents to convert. The states reviewed utilized similar funding mechanisms; however the state programs are tailored to address specific demographic, geography, and selected OSWT systems, thereby helping to achieve the state's program goals. Some programs had greater success than others, and many developed programs in consideration of the successes and lessons learned from other state programs. Key take a ways from other financing programs include:

- Financial Programs:
  - Eight states have created robust financial programs which provide low to no interest loans and incentives to ease the high cost of upgrading cesspools to AIE technologies.
  - The states of New York, Maryland, and Rhode Island offer grants and low interest loans to individual homeowners.
  - Massachusetts provides an ongoing tax credit program as an incentive.
  - Texas provides competitive grants to support applied research of OSWT systems, which is funded from a fee collected for each permit issued.
  - In most states, homeowners are required to upgrade the OSWT system upon sale or property transfer.
- Funding Mechanisms for Cesspool Conversion Financing Programs:
  - Cesspool financing programs were funded through EPA, CWSRF or state funds, with CWSRF funding being the primary source.
    - The primary CWSRF mechanisms utilized to fund individual homeowner programs were Conduit Lending or Linked Deposits.
    - Most CWSRF programs utilize a pass-through entity (e.g. county, local governing body, financial institution or approved non-profit) to administer the loans from loan application to loan repayment.
  - The pass-through entity was ultimately responsible for the loan repayment to the CWSRF program but had mechanisms established to recover loans if there was a default.
  - Maryland's Bay Restoration Fund is unique in that they charge an annual user fee to OSWT systems and a monthly sewer connection fee to cover the program administration and grant costs.
- Program Administration:
  - Several programs have established partnerships with non-profits, counties, or financial institutions to serve as the conduit agency responsible for the administrative loan activities, thereby reducing the administrative burden on the states' CWSRF program.
  - The long timeline for program implementation also required that states establish a sustainable financing mechanism including sources and revenue streams to cover program administration and other costs. Most programs recovered costs through the interest rate on the loan; one program utilized state funds to cover the administrative costs of the program.
- Eligible Project Costs
  - Eligible project costs include converting failing or existing cesspool systems or connecting to sewer systems.
  - Eligible costs include planning, design, implementation/construction, and permit costs.
  - Funding was not applicable to new developments.

- Project Eligibility Criteria
  - All programs required that the applicant have good standing credit and that the loan be secured by a mortgage lien or some other similar mechanism. Two programs provided alternative funding for applicants who could not qualify due to credit issues.
  - Individual homeowners were required to secure approval of proposed AIE technology and design prior to start of construction in order to be eligible to receive financing. Approval was typically provided by the county or local permitting agency.
  - Most programs did not have an income requirement; however, several provided incentives for disadvantaged communities (DACs), low income households, or the elderly.
- Programs Funding:
  - Individual homeowner loans ranged from $1,000 to $35,000.
  - Interest rates ranged from no interest loan to low interest (3-6 percent) to individual homeowners.
  - Loan period ranged from 10-20 years or the useful life of the system.
  - There was no pre-payment penalty for any program.
  - In several programs the homeowner was required to repay the loan upon sale or transfer of property.
- Disbursements:
  - Key issues included the timing of disbursements as well as method of disbursement.
  - The majority of programs required construction to be completed prior to the disbursement of funds, therefore homeowners were required to pay the project costs upfront and then be reimbursed.
  - Method of monetary disbursements varied with most programs directly compensating the homeowner. In two programs, the states directly compensated the contractor for construction costs.
  - Repayment mechanisms included monthly payments or annual line item in property tax bill.

As the CCWG develops the recommended financing approach to the cesspool conversion program, it is recommended that the further outreach and vetting be conducted of identified state-wide funding mechanisms - especially programs in the states of Delaware, New York (Suffolk County), Washington, Maryland, and Massachusetts.

1.5 Federal and State Low Interest Loans and Grants for Cesspool Conversions

Available federal, state, and local funding sources should be considered as potential funding mechanisms to help reduce the overall costs on individual homeowners in the near-term. However, it is important to recognize that with federal and state budget constraints and an overall increased interest in grants and low interest loan programs, sources of low interest loan financing and grant funding are limited and/or are more competitive to secure especially for non-point source projects.

Larger funding programs generally provide some of the best opportunities to obtain sources of funding (e.g. Water Infrastructure Finance and Innovation Act [WIFIA], CWSRF, USDA, etc.). While these programs provide relatively large sources of grant funding, there are limitations. There are numerous factors that should be considered in the pursuit of low interest loan and grant funding, including:

- **Project Specific.** Most programs target a specific type of project or purpose. For a project to be competitive, it needs to meet the intent of the program.
- **Funding Recipient.** Most federal and state programs require that the funding recipient be a public entity or in some cases a qualified non-profit. *For the cesspool conversions, this may require*

partnerships or public entities serving as a conduit agency (resulting in associated increased administration costs) to funnel funding to private homeowners.

- **Established Application Timelines.** Application timing is critical for most grant and loan programs. While some funding agencies accept applications on a rolling basis, many have prescribed submission dates. Grant tracking is critical to align an agency for a funding program.
- **Project Readiness.** Availability of shovel-ready projects is a key consideration for several programs. For example, potential COVID-19 stimulus monies are anticipated to prioritize projects that are ready to be implemented and help kick start the economy.
- **Funding Restrictions.** Most programs do not allow for the retroactive funding of design and construction work, and some programs will only fund activities that are conducted post project approval. *For the cesspool conversions, this may be a consideration for DOH to ensure the technologies that are implemented comply with state performance requirements.*
- **Does not cover the full cost of the project.** Most funding programs do not cover the full cost of the project, requiring the sponsoring entity or funding recipient to provide a minimum cost share ranging from 50-60 percent of the eligible project costs. *This may be another challenge to the conversion of cesspools, as many residents may not even have the financing to cover a portion of the project costs.*
- **Funding award is NOT a promise of grant reimbursement.** Most loans and grants are reimbursements and not cash up front. *This requires that the funding recipient has a source of funding available for the construction of the project, and may be a significant hurdle to cesspool conversions in Hawai'i.*

1.5.1 Potential Grant and Loan Funding Sources for Hawai'i

Current funding options for cesspool conversions for individual homeowners or groups of homeowners are limited and typically consist of property assessments, tax credits, and low-interest loans and grants from various federal, state, and community-based agencies. The following is a summary of federal, state, and county funding options that can be used to fund cesspool conversion projects, but many require a public entity be the primary applicant. Appendix C includes a discussion of each of the federal and state programs presented below. Table 1.4 provides a summary of the key aspects of each of the funding programs.

Table 1.4 Summary of the Federal, State and Local Funding Programs, Models and Initiatives to Consider for the Conversion of Cesspools

Program	Agency	Type	Description
Federal Funding Programs			
Clean Water State Revolving Fund Program (CWSRF)	EPA	Low Interest Loan	CWSRF program is a federal-state partnership that provides communities with a source of low-cost financing for the construction, repair and rehabilitation or replacement of decentralized wastewater treatment systems. There are mechanisms by which the CWSRF funding can be funneled to individual residential owners for cesspool conversions. The state of Hawaiʻi's CWSRF program details are provided below under State Funding Programs. *Program provides a reimbursement for costs incurred. Requires applicant to provide initial outlay of cash for project.*
Water Infrastructure Finance and Innovation Act (WIFIA)	EPA	Low Interest Loan	Financing mechanism for large water/wastewater/infrastructure projects • Project cost > $20 million or $5 million for small community projects (25,000 of fewer) • Eligible projects include a single project, combination of projects or program of projects. • Eligible costs include planning, design and construction activities. • Provides for up to 49% of the project costs ; 51% to be provided by applicant (funds can include entity financing, bonds, SRF, grant, etc.) • Total amount of federal funding <80% • Single Fixed Rate established at loan closing (rate of securities of a similar maturity + basis point (0.01%)) • Loan term is 30 years (or useful life of project). • Payments can be deferred 5 years • Reserve requirement – 1-year repayment • Customized repayment schedule • Application fees apply (average $300,000-$500,000) • Compliance with federal requirements (National Environmental Policy Act [NEPA], AIS, Davis Bacon, etc.) • Project completion in 5 (preferred). *Program provides a reimbursement for costs incurred. Requires applicant to provide initial outlay of cash for project.*
Non-Point Source (NPS) Section 319 Program	EPA	Grants	Grants to states to control NPS from variety of sources including agricultural runoff, mining activities, and onsite septic systems. States are required to use 50% of their allocation for watershed projects, and the remaining funds can be used for non-point source projects including cesspools. In Hawaiʻi, the NPS grants administered through Hawaiʻi's Clean Water Branch Polluted Runoff Control Program (319 Grant Program). • For implementation projects that control polluted runoff and improve water quality; Projects typically implement a component of a Watershed Management Plan, TMDL or action plan. • Recipient may include counties, educational institutions, state agencies, non-profit entities, watershed groups, for profit organizations and environmental groups. • Program funding varies by year ($600,000 for FY 2018) • Grant match requirement 25% non-federal match • No limit on award. • Prefer projects to be completed with 36 months of NTP. *Program provides a reimbursement for costs incurred. Requires applicant to provide initial outlay of cash for project.*

Program	Agency	Type	Description
Title XVI/WIIN Water Reclamation and Reuse	USBR	Grant	• Eligible projects include recycled water feasibility, demonstration, and construction projects. • Provides 25% construction costs • Maximum grant limit of $20 million. • Requires Congressional Authorization • USBR approved feasibility study, • Comply with NEPA, • Demonstrate the ability to pay the remainder of the construction costs. *Program provides a reimbursement for costs incurred. Requires applicant to provide initial outlay of cash for project.*
Drought Resiliency Projects	USBR	Grant	• Funding is for implementation projects building long-term resiliency to drought. • Types of projects include moving pipelines, small recycling, storage reservoir construction, and projects that increase flexibility in drought. • Two Funding: Group 1 $300,000 (complete in 2 years); Group 2 $750,000 (complete in 3 years). • 50% cost share requirement. *Program provides a reimbursement for costs incurred. Requires applicant to provide initial outlay of cash for project.*
WaterSMART Small-Scale Water Efficiency Projects	USBR	Grant	• Eligible projects include small on the ground implementation projects (such as canal lining, supervisory control and data acquisition [SCADA], flumes, flow metering, turf irrigation) to support water planning. • The total project cost to be capped at $150,000. • 50 percent cost share. • Total Federal funding limit of $75,000. *Program provides a reimbursement for costs incurred. Requires applicant to provide initial outlay of cash for project.*
WaterSMART Water and Energy Efficiency Grants	USBR	Grant	• Eligible projects include projects that result in quantifiable and sustained water savings, increase renewable energy use and improve energy savings, and support broader water quality sustainability benefits. • Requires a 50% cost share. • Two funding limits: – $300,000 (typically for projects completed within a year). – Up to $1,000,000 (for projects to be completed in 3 years). *Program provides a reimbursement for costs incurred. Requires applicant to provide initial outlay of cash for project.*
Cooperative Watershed Management Program	USBR	Grant	**Watershed Group Development and Watershed Restoration Planning**: • Provides funding for the development of watershed groups, watershed restoration planning, and watershed management project design (Phase I). • Applicant must be a public entity. • Provides up to $50,000 per year for a period of up to two years (total of $100,000) with no non-Federal cost-share required. **Implementation of Watershed Management Projects**: • Provides cost-shared financial assistance to established watershed groups to implement watershed management projects. • Up to $300,000 per project. • Applicants must contribute at least 50% of the total project costs. *Programs provides a reimbursement for costs incurred. Requires applicant to provide initial outlay of cash for project.*

Program	Agency	Type	Description
Public Works and Economic Adjustment Assistance Programs	U.S. Department of Commerce - Economic Development Administration (EDA)	Grant	• Provides grants for public works projects, including wastewater and stormwater projects that promote economic development. • Provides a 50% percent match in funds up to $5 million based on the number of permanent jobs created by the proposed project (for every job created, the funding is $10,000). • Projects need to be completed within 5 years. *Program provides a reimbursement for costs incurred. Requires applicant to provide initial outlay of cash for project.*
Water and Waste Disposal Guaranteed Loans and Grants (water & sewer)	USDA Rural Development	Low Interest Loan	<u>Predevelopment Planning Grants</u> • Grant assistance to low-income communities for initial planning efforts. • Maximum grant amount of $30,000 or 75% of the predevelopment planning costs. • Requires a 25% cost share from applicant or third-party sources. <u>Water and Waste Disposal Loan and Grant Program</u> – • Direct loan/grant and loan guarantees for clean and reliable drinking water systems, sanitary sewage disposal, sanitary solid waste disposal, and stormwater drainage. • Eligible applicants: state/government entities, private non-profits and federally recognized tribes. • Populations of 10,000 or less. • 40-year loan term (maximum useful life of the facilities). • The interest rate is based on the need for the project and the median household income of the area to be served. *Program provides a reimbursement for costs incurred. Requires applicant to provide initial outlay of cash for project.*
Rural Housing Service Program	USDA Rural Development	Low Interest Loan	Provides assistance through home repair loans and grants to remove health and safety hazards or make a home accessible for household members. • Funds can be used to repair or replace septic systems and other health and safety hazards. • Loans are available up to $20,000 at a one percent fixed interest rate • Loan term is 20 years. • Seniors age 62 and older may be eligible for a loan and grant combination to make needed repairs and improvements. • The maximum lifetime grant amount is $7,500. • Must be located in a rural community and income <50% of median income. *Program provides a reimbursement for costs incurred. Requires applicant to provide initial outlay of cash for project.*
Rural Economic Development Loan and Grant Program	USDA Rural Development	Low Interest Loan and Grant	Provides zero-interest loans to local utilities to pass to local businesses for projects that will create and retain employment in rural areas. Grants of up to $300,000 are provided to the local utility which establishes a Revolving Loan Fund (RLF) from which loans are provided to local sponsors. • Funding for up to 80% of project costs. • Eligibility is based on household income < 50% of the area median income and located in a rural community. *Program provides a reimbursement for costs incurred. Requires applicant to provide initial outlay of cash for project.*
Rural Water Loan Fund (RWLF)	National Rural Water Assoc.	Loan *Provides reimbursement for incurred cost*	RWLF is a funding program specifically designed to meet the unique needs of small water and wastewater utilities. The RWLF was established through a grant from the USDA/RUS, and repaid funds used to replenish the fund and make new loans. • Provides low-cost loans for short-term repair costs, small capital projects, or pre-development costs associated with larger projects. • Loan amounts may not exceed $100,000 or 75% of total project cost, whichever is less. • Loan offers below market interest rate. • Maximum repayment period of 10 years. *Program provides a reimbursement for costs incurred. Requires applicant to provide initial outlay of cash for project.*

Program	Agency	Type	Description
CDBG Program	US Department of Housing and Urban Development	Grant	Entitlement and Non-Entitlement Grants: Program offers both entitlement and non-entitlement grants to low to moderate income communities to meet housing and community development needs including public facilities. Eligible activities include construction of public facilities and improvements, such as water and sewer facilities, and streets, public services, activities related to energy conservation and renewable resources, etc. Honolulu Field Office directly administers the CDBG Program for non-entitlement counties in the State of Hawaiʻi including Hawaiʻi, Kauaʻi and Maui. Section 108 Loan Guarantee Program - Provides CDBG https://www.hudexchange.info/programs/cdbg/recipients the ability to leverage their annual grant allocation to access low-cost, flexible financing for economic development, housing, public facility, and infrastructure projects. Communities can use Section 108 guaranteed loans to either finance specific projects or to launch loan funds to finance multiple projects over several years. The loan term is 20 years. *Programs provide a reimbursement for costs incurred. Requires applicant to provide initial outlay of cash for project.*
State Funding Programs			
State Income Tax Credit	State of Hawaiʻi Department of Health	Credit	A State income tax credit is available for upgrading to a septic system or aerobic treatment unit, or connecting to a sewer, • Qualified cesspools depending on their location. Qualified cesspools are cesspools that are: located within 200 feet of a shoreline, perennial stream or wetland, or within a source water assessment program area. • A taxpayer may apply for a tax credit up to $10,000 for the documented expenses of upgrading each qualified cesspool. • Tax credits are available for five years, starting in tax year 2016, January 1, 2016, and ends in tax year 2020, December 31, 2020. • $5,000,000 total cap on the credits available for each tax year. Legislation to extend the tax credit did not pass in 2020.
CWSRF	State Department of Health	Loan	Financing for the construction of water pollution control projects necessary to prevent contamination of groundwater and coastal water resources and to protect and promote the health, safety and welfare of the citizens of the State. Provides low interest loans to county and state agencies to construct point source and nonpoint source water pollution control projects. • Covers planning, design and construction activities. • Loan proceeds fund up to 80 percent of project costs and require a 20 percent non-federal match. • Loan term of 30 years. • Annual interest rate of 0.25 percent and semi-annual loan fee of 0.5%. • Green Project Reserve of 10 percent which is reserved to fund green infrastructure. FY 2019 set aside was approx. $1.23 million.
Hawaiʻi Cesspool Remediation and Conversion Loan Program *(proposed)*	State SB 221	Loan	Enacted in July 2019, this bill authorizes the wastewater departments of all counties to offer low-interest loans for the upgrade or conversion of cesspools in each county to aerobic treatment unit systems. The loan program shall include an on-bill financing option supported by funding from the water pollution control revolving fund.
Environmental Infrastructure Loan Program	Rural Community Assistance Corporation (RCAC)	Loan	• Eligible projects include water, wastewater, solid waste and storm water facilities that primarily serve lower-income rural communities. • Public agencies, tribal governments, and nonprofits in rural populations of 50,000 or less in Hawaiʻi are eligible to apply. • Feasibility, pre-development, and construction phases are eligible. • Max for construction funding is $3M. • 20 years repayment. • 5% interest for first 10 years.
Fresh Water Initiative	Hawaiʻi Community Foundation (HCF)	Grant	The Initiative is supported by a funding partnership of 10 funders and is designed to proactively address and resolve water supply issues. HCF is specifically interested in organizations proposing to build or expand their own capacity to: 1) Lead a network of water entities; 2) Lead implementation around water conservation; 3) Lead implementation around water recharge; and/or 4) Lead implementation around water reuse in the Hawaiian Islands.
Fresh Water Initiative	Ulupono Initiative (Ulupono)	Grant/Other	Ulupono typically focuses on several investments of $1 million to $3 million in key mission projects: food, energy and waste in Hawaiʻi. UI identifies key partners, leverage points and linkages to determine where the most impact can occur. The initiatives goal is to infuse investment capital, or grants, along with collaboration and guidance to help our partner organizations find success in achieving impact.

Program	Agency	Type	Description
Green Energy Money $aver (GEM$) On-Bill Program	State of Hawaiʻi Department of Business, Economic Development & Tourism (DBEDT) Hawaiʻi Green Infrastructure Authority	On-Bill Financing Program	The Hawaiʻi Green Infrastructure Authority (HGIA) was created by the Legislature to make renewable energy investments accessible and affordable to Hawaiʻi's consumers. HGIA was capitalized through the issuance of a Green Energy Market Securitization (GEMS) bond, an innovative municipal bond financed mechanism allowing the advance of the State's goal of achieving 100% renewable portfolio standard in the electric sector by 2045. Some of the programmatic areas of the HGIA program, especially related to the GEM$ program can be used should cesspool remediation financing move towards a similar billing program.
Property Assessed Clean Energy (PACE)	State/ County/ Local	Financing Assessment	PACE programs are used by local governments to allow property owners to finance energy efficiency and renewable energy improvements (such as solar) to pay for the up-front cost of energy or other eligible improvements on a property and then pay the costs back over time through a voluntary assessment. By enabling a PACE program, local governments can greatly facilitate a commercial or residential property owner's ability to bundle energy efficiency and renewable energy investments to make comprehensive upgrades to their properties. A PACE program could be modified as a viable financing option for consideration to allow a property owner to pay back the costs of their cesspool remediation over time at an agreed upon interest rate and length of loan terms. Funding would occur through private lenders such as private banks or the issuance of municipal bonds.
Community Facilities District (CFD) Special Improvement District (SID)	State/ County/ Local	Financing Assessment on property	CFDs or SIDs, are independent, local special-purpose financing districts that levy taxes and assessments and issue bonds to provide infrastructure to communities.
HB 2151, HD 1 Relating to Cesspool Conversion	Department of Health	Grant	*This proposal is current moving through the State legislature.* Establishes a cesspool compliance pilot grant project to assist low- and moderate-income property owners with the costs of upgrading or converting a cesspool. Applies to cesspools identified as failing by the Department of Health.
Water Quality Program	The Hanalei Initiative	Community Group	The Hanalei Initiative, a collective group of citizens working for the betterment of Hanalei and the North Shore. Water quality is one of the main focus areas: Through potential DOH grant funding and private capital, the Hanalei Initiative is exploring financing options for converting cesspools to aerobic system conversions that actually treat water on site.
Hanalei Cesspool Conversion	Hanalei Watershed Hui	Community Group	Program provides funding to help pay for the replacement of cesspools, with a nonpolluting Advanced Treatment Unit, for residents living between Waioli and Hanalei Rivers and have a cesspool.

1.5.2 Federal Funding

The following is a summary of federal grant and low interest loan programs that may be viable financing opportunities for the cesspool conversions.

1.5.2.1 Environmental Protection Agency

The following sections summarize the applicable funding mechanisms supported by the EPA.

Clean Water State Revolving Fund Programs

The CWSRF program, a federal-state partnership, provides communities with a source of low-cost financing for a wide range of water quality infrastructure projects. One of the CWSRF program eligibilities includes the ability to provide financial assistance for the construction, repair and rehabilitation or replacement of decentralized wastewater treatment systems. CWSRF funding can be provided to public entities, such as municipalities, county governments, and state agencies, private, and non-profit organizations.

Applicability/Considerations for Cesspool Conversions:

- *See discussion under section 1.5.3.*

Water Infrastructure Finance and Innovation Act

The WIFIA program accelerates investment in water and wastewater infrastructure by providing low interest financing for planning/design and construction of large dollar value projects. WIFIA works separately from, but in coordination with, the CWSRF programs in each state.

Applicability/Considerations for Cesspool Conversions:

- *The program is a viable funding mechanism for cesspool conversions.*
- *Applicant will need to be either the CWSRF program, a public entity, approved non-profit or a conduit agency to apply and disburse funds to individual homeowners.*
- *Program provides low-interest loans which will require repayment.*
- *Minimum project cost is $20 million for large communities or $5 million for small communities (population<25,000). This will require packing of cesspool conversion projects or may be more appropriate for financing decentralized systems.*
- *Funding program provides loans for up to 49 percent of projects costs, requiring the applicant to provide the match financing of 51 percent.*
- *Loan is issued as a disbursement for costs incurred, so will require homeowner to initially pay for the conversion.*
- *Requires compliance with federal and state requirements.*

Non-Point Source Section 319 Grants

Under section 319 of the Clean Water Act, EPA provides grants to states to control nonpoint sources (NPS) of pollution from a variety of sources such as agricultural runoff, mining activities, and malfunctioning onsite septic systems. In Hawaiʻi, NPS grants are administered through Hawaiʻi's Clean Water Branch Polluted Runoff Control Program (PRC), which is under DOH. In the *2015-2020 Hawaiʻi Nonpoint Source Management Plan*, cesspool wastewater was identified as a source of non-point source runoff impacting the state's resources and therefore may be eligible for NPS Grant funding.

Applicability/Considerations for Cesspool Conversions:

- *May be a viable funding mechanism for near-term cesspool conversions.*
- *Applicant would need to be either a public entity, approved non-profit or watershed group.*

- *Grant is issued as a disbursement for costs incurred, so will require homeowner to initially pay for the conversion.*

1.5.2.2 United States Department of Interior, Bureau of Reclamation

The USBR WaterSMART program provides cost shared financial assistance to states, tribes and local governments to help them plan and implement projects to increase water supply through investments to modernize existing infrastructure. WaterSMART funding opportunities include: Title XVI/Water Infrastructure Improvements for the Nation (WIIN) grants, Water and Energy Efficiency Grants, Drought Program, Basin Study, Desalination, and Cooperative Watershed Management Programs (CWMP). These programs were evaluated for applicability for the cesspool conversion project and do not appear to be feasible at this time as viable funding options, except for the CWMP.

United States Department of Interior, Bureau of Reclamation – Cooperative Watershed Management Program

Through the CWMP, Reclamation provides funding to watershed groups to encourage stakeholders to form local solutions to address water management needs. Funding is provided for the development of watershed groups, watershed restoration planning, and watershed management project design (Phase I). A second program, Implementation of Watershed Management Projects, provides funds to established watershed groups to implement watershed management projects that address critical water supply needs and water quality concerns. As part of Phase I activities, applicants may use funding to develop bylaws, a mission statement, complete stakeholder outreach, develop a watershed restoration plan, and watershed management project design.

Applicability/Considerations for Cesspool Conversions:

- *May be a viable program for the organization of watershed groups and the development of watershed management plans.*
- *Eligible applicants include states, Indians, tribes, local and special districts, local government agencies, and non-profit organizations.*
- *Grant is issued as a disbursement for costs incurred, so the watershed group will have to cover the expenditures and then be reimbursed.*

1.5.2.3 United States Department of Commerce – Economic Development Administration

Public Works and Economic Adjustment Assistance Programs

The EDA provides grants for public works projects provide grant funding for public works projects, including wastewater and stormwater projects that promote economic development, through its Public Works and Economic Adjustment Assistance Program. Financial support is provided for up to 50 percent in matching funds (up to $3 million) based on the number of permanent jobs created by the implementation of the proposed project.

Applicability/Considerations for Cesspool Conversions:

- *May be a viable program for the cesspool conversions if it can be demonstrated that the project will result in permanent job generations.*

1.5.2.4 United States Department of Agriculture

Water and Waste Disposal Loan and Grant Program

The USDA provides funding directed at low-income and or small water/wastewater utilities. USDA provides Predevelopment Planning Grants which assist low-income communities with the initial planning and development of applications required for USDA Development program. The Water and Waste Disposal Loan

and Grant Program provides direct loan/grant and loan guarantees for clean and reliable drinking water systems, sanitary sewage disposal, sanitary solid waste disposal, and stormwater drainage.

Applicability/Considerations for Cesspool Conversions:

- *May be a viable funding mechanism for cesspool conversions in rural communities or towns (population of less than 10,000 people).*
  - *Applicants include most state and government entities, private non-profits, and federally recognized tribes.*
  - *Grant is a disbursement for costs incurred, so it will require homeowner to initially pay for the conversion.*

1.5.2.5 Rural Housing Services Program

The Rural Housing Service Program provides assistance through home repair loans and grants to remove health and safety hazards or make a home accessible for household members.

Applicability/Considerations for Cesspool Conversions:

- *Source may be a viable funding mechanism for rural areas to help cover planning costs associated with the cesspool conversions.*
  - *Eligibility requirement includes rural and towns with populations of 10,000 or less.*
  - *Program eligibility is based on household income that cannot exceed 50 percent of the area median income and the property must be located in a rural community.*
  - *Funds can cover all upfront and construction costs, including septic system designs, permits and installations.*
  - *Funding is a disbursement for costs incurred, so will require homeowner to initially pay for the conversion.*

1.5.2.6 Rural Economic Development Loan and Grant Program

The Rural Economic Development Loan and Grant program provides funding for rural projects through local utility organizations that support economic development. USDA provides zero-interest loans to local utilities which they, in turn, pass through to local businesses (ultimate recipients) for projects that will create and retain employment in rural areas.

Applicability/Considerations for Cesspool Conversions:

- *Program may be a viable funding mechanism for cesspool conversions in rural areas.*
  - *Program eligibility is based on household income that cannot exceed 50 percent of the area median income and the property must be located in a rural community.*
  - *Loan or grant is a disbursement for costs incurred, so will require homeowner to initially pay for the conversion.*

1.5.2.7 United States Department of Housing and Urban Development – Community Development Block Grants (CDBG)

The HUD awards discretionary funding through various programs including the CDBG program.

CDBG Non-Entitled Counties in Hawai'i Program

HUD administers the Non-Entitled CDBG Program in Hawai'i and allocates funds on a formula basis using population, poverty and housing overcrowding as a basis for allocating funds. The Non-Entitled CDBG Grants in Hawai'i offer a source of funding to benefit community needs in but not limited to economic development, housing rehabilitation, public facilities, and construction or installation for the benefit of low-

to moderate-income persons. In Hawai'i, three counties qualify for this program - Hawai'i, Kaua'i and Maui. Many of the programs are similar to that of the entitlement program with grants for community development activities directed at neighborhood revitalization, infrastructure, economic development and improved community facilities and services.

Applicability/Considerations for Cesspool Conversions:

- *Source maybe a viable funding mechanism for the conversion of cesspools if the three eligible counties agree to utilize all or a portion of their CDBG funds for this purpose.*
  - *Non-entitled communities are defined as cities with a population of less than 50,000 and counties with populations less than 200,000.*
  - *Requires a Consolidation Plan to the Honolulu office to be considered eligible.*
  - *Funding is a disbursement for costs incurred, so will require homeowner to initially pay for the conversion.*

Section 108 Loan Guarantee Program

Section 108 Loan Guarantee Program[4] provides CDBG recipients the ability to leverage their annual grant allocation to access low-cost, flexible financing for economic development, housing, public facility, and infrastructure projects. Communities can use Section 108 guaranteed loans to either finance specific projects or to launch loan funds to finance multiple projects including economic development, housing, public facilities, infrastructure, and other physical development projects, including improvements to increase resilience against natural disasters.

Applicability/Considerations for Cesspool Conversions:

- *Source may be a viable funding mechanism for the conversion of cesspools if the three eligible counties agree to utilize all or a portion of their CDBG funds for this purpose.*
- *Loan is a disbursement for costs incurred, so will require homeowner to initially pay for the conversion.*

1.5.3 State Funding Options

The following is a short discussion on several state grant and low interest loan programs that may be viable financing opportunities for the cesspool conversions. The focus of the funding options review was limited to those options available for individual homeowners or groups of homeowners to finance OSWT systems and typically consist of property assessments and low-interest loans and grants from various state and community-based agencies.

Hawai'i State Department of Health Clean Water State Revolving Fund Program

The CWSRF program is a federal-state partnership that provides communities with a source of low-cost financing for a wide range of water quality infrastructure projects. With the passage of the 2014 Water Resources Reform and Development Act (WRRDA) Amendments, the CWSRF program eligibilities were greatly expanded, including the ability of the program to provide assistance for the construction, and repair or replacement of decentralized wastewater treatment systems that treat municipal wastewater or domestic sewage. In addition, CWSRF funding can be provided to public entities, such as municipalities, county governments, and state agencies, and through various mechanisms funding can be provided to private and non-profit organizations.

[4] https://www.hudexchange.info/programs/cdbg/

The CWSRF loan assistance program has flexibility and can set the conditions for loan assistance, which can be exceptionally helpful in financing nontraditional eligibilities, such as cesspools, including:

- Loan maturities can range up to 30 years or useful life of the project.
- Repayment schedules can be structured to meet the needs of the borrower.
- Interest rates can vary from market rates to zero percent.
- Ability to provide lower interest rates to DACs.
- Repayment source does not have to be the project itself; any dedicated source of revenue can be used to repay a non-point source loan.

It is estimated that $5 million per year is the maximum financing that can currently be obtained through the CWSRF program for cesspool conversions. This level of funding represents less than 10 percent of the average annual cost of all cesspool conversions over the 30-year period. In addition, distribution of these funds to individual homeowners will place a significant burden on the DOH, which currently does not have the staff nor the administration capabilities to review and process individual applications, disperse the funds, and conduct follow-up payment collection. Additional support with funding and finance applications and management from counties, financial institutions, or non-profits may be required.

Applicability/Considerations for Cesspool Conversions:

- *The program is a viable funding mechanism for cesspool conversions; however, the administrative workload on CWSRF staff will need to be addressed.*
- *Applicant would need to be either a public entity, such as the counties, financial institution, approved non-profit, or other conduit agency to disburse funds to individual homeowners.*
- *Loan is issued as a disbursement for costs incurred, so will require homeowner to initially pay for the conversion.*
- *Requires compliance with federal and state requirements.*

Appendix D includes more information on potential CWSRF funding mechanisms for non-traditional projects.

Hawai'i Rural Community Assistance Corporation (RCAC)

RCAC provides low interest loan financing for feasibility, pre-development, and construction projects. Feasibility efforts are typically not more than $50,000 and a typical term is 1 year. Pre-development projects such as engineering, legal, and bond counsel efforts are typically not to exceed $350,000 and the term is 1 year. Maximum loans for construction funding are $3M. Loan terms are up to 20 years; 5 percent for the first 10 years and subject to change for longer term loans. Loan fees are 1 percent.

RCAC has funded water projects on Maui and O'ahu.

Applicability/Considerations for Cesspool Conversions:

- *This a viable funding program for cesspool conversions for low income rural communities.*
- *Applicant would need to be a public agency, tribal governments, or nonprofits in Hawai'i.*
- *Individual homeowners will likely need to create SIDs to apply for this source of funding.*
- *Loan is issued as a disbursement for costs incurred, so will require homeowner to initially pay for the conversion.*

Hawaiʻi Rural Water Association (Rural Water Loan Fund)

This state association is a chapter of the Rural Water Association and provides funding to infrastructure projects targeted at replacing equipment, providing system upgrades and completion of small projects including energy efficiency, sustainability and disaster recovery projects.

Applicability/Considerations for Cesspool Conversions:

- *This a viable funding program for rural communities. However, individual homeowners will likely need to create a SID to apply for this source of funding.*
- *Loan is issued as a disbursement for costs incurred, so will require homeowner to initially pay for the conversion.*

Proposed Hawaiʻi Cesspool Remediation and Conversion Loan Program

State SB 2850/HB2540 introduced legislation in 2018 that would create a specific program for cesspool remediation and conversions. This program is envisioned to provide low-interest loans to cesspool owners for the upgrade or conversion of cesspools to ATUs in each county. The loan program would include an on-bill financing option supported by funding from the water pollution control revolving fund. In 2019 SB 221 was passed to establish a similar loan program, effective July 2019. This program was to be implemented through the counties in coordination with DOH.

Applicability/Considerations for Cesspool Conversions: It is not clear whether this program has been implemented.

Office of Hawaiian Affairs Malama Loans

The mission of the Office of Hawaiian Affairs (OHA) is: "To enhance access for all persons of native Hawaiian ancestry to credit, capital and financial services and skills so as to create jobs, wealth, and economic and social well-being for all the people of Hawaiʻi." To support their mission, OHA provides loans and grants for native Hawaiian businesses and individuals.

The Malama Home Improvement Loan is available in amounts ranging from $2,500-$100,000. Loans over $20,000 must be secured by non-real estate assets. Current terms are 5-6 percent interest and up to a 7-year loan period. Loan applications must include: proof of Hawaiian ancestry and Hawaiʻi residency, contractor's estimate of the work, 2 years of federal tax returns and W-2s, and 1 month of current pay stubs.

While this program has limited eligibility, i.e. not all cesspool homeowners are native Hawaiian, it may be a financing option for those who do qualify. The state may consider evaluating funding options tied to native Hawaiian ancestry through organizations like Bishop Estate and the Department of Hawaiian Home Lands to assist the native Hawaiian community. This approach could already be available through federal programs such as HUD.

1.5.4 Hawaiʻi Cesspool Tax Credits, State Income Tax Credit (Act 120)

Hawaiʻi currently provides a state income tax credit for qualified cesspool owners upgrading to a septic system, ATU, or connecting to a sewer. Qualified cesspools are cesspools that are: located within 500 feet of a shoreline[5], perennial stream or wetland[6], or within a source water assessment program area[7]. A list of

[5] Hawaiʻi Administrative Rules §13-222-2
[6] Hawaiʻi Administrative Rules §11-54-1
[7] As determined by the Department of Health based on a two year time of travel from a cesspool to a public drinking water source

cesspools (identified by tax map key and county) that already meet the criteria of Act 120 is available on the DOH website[8].

A taxpayer may apply for a tax credit of up to $10,000 for documented expenses associated with upgrading each qualified cesspool. Under the current law, tax credits are available for five years (tax years 2016-2020), ending on, December 31, 2020. The state provided a maximum of $5,000,000 of credits that are available for each tax year. Any taxpayer who has upgraded a qualified cesspool but is not eligible to claim the credit in a taxable year because the cap has been reached shall be eligible to claim the credit in the subsequent years. Legislation to extend the tax credit did not pass in 2020.

While this program has several financial advantages for those homeowners who file state income taxes, there are likely many homeowners who are below the threshold for filing state income taxes and therefore are not able to take advantage of this option. Given that only 47 applications have been filed for this credit[9], this incentive may have limited application to current cesspool owners.

While the tax credits help to offset some construction costs associated with the conversion, it does not provide:

- Relief for the on-going maintenance and management of the new OSWT option.
- Relief to low-income customers who do not earn enough to qualify for this credit.
- Relief in upfront costs to retain assistance from a licensed civil engineer.

In addition, depending on the selected OSWT, the credit may only cover a fraction of the cost borne by the homeowner. Pending legislation may extend the term of this program, however an assessment of the accessibility by all homeowners to this incentive should be considered and other mechanisms identified.

1.6 Other Funding Models and Partnerships

This section summarizes less traditional funding models, including models used by other infrastructure systems in Hawai'i, e.g. energy, and specific, community-based funding models. Other non-traditional funding models include point of sale conversion requirements that would mandate the conversion of cesspools prior to sale of a house was initially considered in 2018 (SB 2567). However, at the time, it was not deemed feasible due to resistance from the real estate community and homeowners and was tabled for future discussion in 2020. This was prior to the COVID-19 impacts; consideration of mandated cesspool conversions prior to property sales may be postponed in light of larger economic issues in the State.

1.6.1 On-Bill Financing Program – Example: Hawai'i Green Infrastructure Authority

On-bill financing and repayment programs have been providing options for property owners for many years to pay for investments in clean energy upgrades through their utility. On-bill financing allows the electric utility to incur the cost of the clean energy upgrade, which is then repaid by the homeowner on the utility bill[10]. The upfront capital is provided by a third party, not the electric utility. In some on-bill repayment programs, the loan is transferable to the next owner of the home, building, or property. The idea of an on-bill financing program could be adapted towards the financing cesspool conversions with the assistance of other agencies that could assist in the billing administration function similar to electric utilities.

[8] https://health.hawaii.gov/wastewater/home/taxcredit/
[9] Number of filings from 2015-2017.
[10] Example utilities include Hawaiian Electric Company, Maui Electric Company, or Hawaiian Electric Light.

An on-bill financing model currently exists in the State. Act 211 authorized the establishment of the green infrastructure program, known as GEM$ to deploy clean infrastructure[11]. The legislation, among other key objectives, enabled ratepayers to finance clean energy improvements through an on-bill financing model that allows ratepayers to spread the initial capital costs of installing green infrastructure of up to 20 years, thus providing an affordable way to invest in green infrastructure that will reduce monthly energy costs.

The GEM$ program is operated under the Hawai'i Green Infrastructure Authority (HGIA) and has many of the similar on-bill functions a cesspool conversion program would require for implementation. For example, certain program functions of the GEM$ program, such as program marketing, construction contractor outreach, education and training, and loan functions[12] may be applied towards a cesspool conversion financing program. As of November 2017, $77.8 million in GEM$ funds have been committed to residential and commercial energy projects in the State. Following is a summary of key features of the GEM$ program:

- ***Possible Eligible Applicants.*** The GEM$ program serves low and moderate-income, single-family residential homeowners and renters, small businesses as defined by the U.S. Small Business Administration, multi-family rental projects, and non-profits. Financing for the GEM$ program was recently expanded so that participant eligibility under the program is not based on the creditworthiness of the applicant, and the on-bill repayments obligation is transferable to the next owner or tenant. In other words, the obligation for repayment is tied to the utility meter, not the individual homeowner. Approval does not require a credit check or income verification. HGIA bases approval on a good utility bill payment history – no disconnection notices in the previous 12 months – and an estimate that the project will deliver a minimum of 10 percent utility bill savings, including the repayment charge, after installation of the retrofit.
- ***Types of Projects.*** The HGIA has financed projects under its GEM$ program such as solar photovoltaic systems, energy storage, lighting upgrades, heating, ventilation, and air conditioning systems (HVAC) upgrades, mechanical upgrades, controls and monitoring devices and energy/water nexus systems.
- ***Pros and Cons***
  - *Pros:* The HGIA GEM$ program is an established on-bill loan program for private energy efficiency solar projects. Several elements of this program, including administration of funding, loan repayment and coordination with an entity for billing, may be applicable for the financing of residential cesspool conversion projects. GEM$ offers financing rates of approximately 5.5 percent over a 20-year loan term.
  - *Cons:* Unlike in the energy model, incentives associated with a cesspool conversion are hard to define for a water/wastewater utility companies to support any proposed bill financing. In addition, there is a question as to the implementation of on-bill financing in rural areas with low income applicants.

1.6.2 Property Assessments – Example: Property Assessed Clean Energy Program

PACE programs are used by local governments to allow property owners to finance energy efficiency and renewable energy improvements (such as solar) to pay for the up-front cost of energy or other eligible improvements on a property and then pay the costs back over time through a voluntary assessment.

A PACE program could be modified as a viable financing option for cesspool conversion to allow a property owner to pay back the costs of their cesspool remediation over time at an agreed upon interest rate and length of loan terms. Funding would occur through private lenders such as private banks or the issuance of municipal bonds.

[11] Sessions Laws of Hawai'i, 2013

[12] Loan functions include origination, underwriting, funding, and servicing.

- ***How PACE could be applied towards Cesspool Conversions.*** While Section 196 of the Hawaiʻi Revised Statutes (HRS) discusses Hawaiʻi's policies, goals, and objectives with respect to energy resource planning, there is no enabling legislation to establish a PACE program. However, HB 1669 was introduced in the 2020 legislative session and assigns the Hawaiʻi State Energy Office to work with the counties to establish a program. The program would allow a property owner to obtain a private loan for a renewable energy system on the property and pay back the loan through an addition to the owner's property tax bill. This PACE program concept, if approved by the legislature and signed by the Governor, could be modified to include cesspool conversions.
- ***Eligible Applicants.*** The PACE financing mechanism has been used in several states where legislation exists to finance improvements on private property such as:
  - Commercial properties (commonly referred to as Commercial PACE or C-PACE)
  - Residential properties (commonly referred to as Residential PACE or R-PACE).

  The unique characteristic of PACE assessments is that the assessment is attached to the property rather than to the individual. A PACE program can be modified to finance cesspool improvements through an assessment on the private property.
- ***Types of Projects.*** PACE programs are used to provide funds for a variety of types of needs, such as energy efficiency upgrades, disaster resilience improvements, water conservation measures, or renewable energy installations of residential, commercial, or industrial property owners. The PACE program could be expanded to include cesspool conversions.
- ***Funding of Projects.*** Historically, this funding has been applied to installation of roof top solar panels for residential homes with typical loans repaid over 5 to 25 years. If applied to cesspool conversion, the PACE financing model allows a property owner to pay back the conversion costs over time at an agreed upon interest rate and loan term. Funding would occur through private lenders or the issuance of municipal bonds depending on enabling state legislation.
- ***Program Requirements.*** In other states, the PACE financing model allows property owners to implement improvements and finance energy efficiency and renewable energy improvements without large up-front cash payments. Property owners that voluntarily participate in a PACE program repay their improvement costs over a set time period (typically 10 to 20 years) through property assessments. Property assessments are secured by the property itself and paid as an addition to the owners' property tax bills. Nonpayment generally results in the same set of repercussions as the failure to pay any other portion of a property tax bill. A PACE assessment is a debt of property, meaning the debt is tied to the property as opposed to the property owner. In turn, the repayment obligation may transfer with property ownership if the buyer agrees to assume the PACE obligation and the new first mortgage holder allows the PACE obligation to remain on the property. This can address a key disincentive to investing in energy improvements because many property owners are hesitant to make property improvements if the resulting savings are not sufficient to cover the upfront costs.
- ***Pros and Cons***
  - *Pros:* A PACE-type model would allow an individual property owner to secure private financing for a comprehensive list of projects, including cesspool conversion. The financing options may include spreading payments over a longer period of time, with the possibility of deducting payments from homeowner's income tax liability.
  - *Cons:* There are no active PACE programs in Hawaiʻi and implementation will require authorizing legislation. There may be resistance by lenders/mortgage-holders whose claims to the property may be subordinated to the unpaid assessment amount should the property go into foreclosure. The ability to provide discounts or accommodations to low income households

may not be feasible. In addition, the program is only applicable to primary property owners, thereby potentially disallowing renters to apply.

1.6.3 Property Assessments – Example: Community Facilities District and Special Improvement Districts

CFDs or SIDs, are independent, local special-purpose financing districts that levy taxes and assessments and issue bonds to provide infrastructure to develop communities of all types.

- ***How CFDs and SIDs Could be Used.*** Existing state legislation allows counties to create CFDs to finance special improvements[13]. Furthermore, the county has power to levy and assess a special tax on property located in the CFD or SID and issue bonds secured by the special taxes to provide funds for special improvements. Related to CFDs, Section 46-80.5 allows for the creation of a SID for the purpose of providing and financing supplemental maintenance and other improvements or services as the council of the county determines.
  An example of an improvement district specifically created to address the EPA's requirement to close large-capacity cesspools is the ID in North Kona in the County of Hawai'i. This ID funds the connection of 110 parcels to the county wastewater system. This funding mechanism could be applied to the funding construction and maintenance of OSWT systems for a subdivision of current cesspool owners.
- **Eligible Applicants.** The County must have a charter and adopt an ordinance to establish a district, "relating to special improvement financing by community facilities districts." The ordinance establishes procedures for the formation of CFDs. It is common for the ordinance to allow for written protest against creation of the CFD. If owners of more than 55 percent of the land proposed or more than 55 percent of owners protest against the proposed CFD, the creation of the district must cease. In the absence of protests as described, a county council may approve an ordinance forming a CFD and levy a special tax on properties with the district.
- **Types of Projects.** The ordinance passed by the county typically describes the types of special improvements that may be undertaken and financed through the formation of the CFD and secured by the special taxes that are imposed. Public improvements and services may be funded with proceeds of municipal bonds secured by the special taxes. SB3057 was passed during the 2018 legislation session to expand the authority of counties to use land-based financing to support operating costs for certain county services provided within SID and CFD.
- **Offer Low Interest Financing to Property Owners Requiring Cesspool Conversions.** CFDs and SIDs offer low interest tax-exempt financing of up to 30-year term (including 5 year principal deferment) to finance public improvements and services such as cesspool conversions. However, to date, this financing vehicle has been rarely used in the State to develop public improvements related to development of certain areas. To finance individual cesspool conversions, a county would have to pass an ordinance to form a CFD or SID and subsequently levy a special tax within the SID to fund the improvements. The use of CFDs and SIDs may only work in a county that has a concentrated area of cesspools requiring conversion.
- **Pros and Cons**
  - Pros: CFDs and SIDs offer low interest tax-exempt financing of up to 30 year term (including 5 year principal deferment) to finance public improvements and services such as cesspool conversions.

[13] See Section 12 of Article VII of the State Constitution and HRS Section 46-80.1.

- Cons: To finance individual cesspool conversions, a county would have to pass an ordinance to form a CFD or SID and levy a special tax to fund the improvements and receive the required fifty-five percent approval from the property owners to form the CFD or SIDs. Moreover, such a financing strategy could only be implemented where dense or concentrated areas of cesspool remediation are needed.

1.6.4 Public-Private Partnerships

Another potential funding mechanism is the development of P3s that encourage private investment in public infrastructure projects. P3s are contractual arrangements in which governments or public entities form partnerships with the private sector to design, finance, build, and operate and/or maintain infrastructure such as toll roads, water supply facilities, and wastewater treatment plants. Many different types of P3s exist because each of the five elements of development can be combined (design, finance, build, operate, and maintain). For instance, in the Design-build-operate-maintain (DBOM) arrangement, contracted private entities are responsible for project design and construction, and also take the responsibility of the operation and maintenance of the project. Public agencies are in charge of financing and theoretically pass all the risks related to operating costs and project revenues to the private partner. A P3 arrangement may shift project financing risks and long-term operations and maintenance responsibilities to the private sector; allowing agencies to leverage private capital and tap private sector expertise; which helps agencies avoid more debt issuance and preserve bond capacity. However, P3s also have some negatives including local opposition; the loss of public control and flexibility; may require a high degree of expertise in-house or having to hire consultants; may require complicated contracts and complex negotiations; and demand huge efforts of enforcement and monitoring contracts.

1.6.5 Hawaiʻi Non-Profit Partnerships

The following sections describe ways that Hawaiʻi's active and robust non-profit community could support cesspool conversions.

Fresh Water Initiative (Ulupono and Hawaiʻi Community Foundation)

The Fresh Water Initiative (Initiative) is an effort sponsored by the Hawaiʻi Community Foundation (HCF), a non-profit organization dedicated to advancing and supporting networks of social change. The goal of the Initiative is to bring together diverse partners to address the complexities of water security against the background of climate change. A key partner in the Initiative is the Ulupono Initiative (Ulupono). Ulupono is a social investment firm dedicated to improving the quality of life in Hawaiʻi through investment in sustainable projects.

The model used in the Initiative for collaboration and partnership should be considered as a model for the cesspool conversion plan since this is a highly complex community problem where multiple voices, many of whom need advocacy, need to come together for a successful solution.

Ulupono and HCF have come together around a common goal of water security and sustainability. Depending upon the technical strategies for the cesspool conversions, there are opportunities for cesspool conversions to improve Hawaiʻi's water security and sustainability. Both organizations may be able to help identify funding options that could achieve the multiple benefits of supporting their goals of not only water security but also acting as agents of community change and empowering communities to build sustainable solutions.

This is not a funding option in the traditional sense; it is more a model of collaboration and coalition-building around an issue aligned with cesspool conversions. It may be worth considering how these partners could assist in the cesspool conversion effort.

Hanalei Initiative and Hanalei Watershed Hui

The Hanalei Initiative is a collective group of caring citizens working for the betterment of Hanalei and the North Shore (of Kaua'i). Water quality is one of the focus areas. Through potential DOH grant funding and private capital, the Hanalei Initiative is exploring financing options for cesspool conversions.

Hanalei Watershed Hui (Hui) was established in 2000 as a non-profit to implement the Hanalei American Heritage River Program and Hanalei Watershed Action Plan. The Hui was working with the DOH in 2017 to help residents apply for $500,000 in grants that would help finance 75 cesspool conversions. Due to lack of interest from residents, the grant was cancelled.

While not a direct funding option, this is another example of community models that could be established throughout the State to educate homeowners around the options for cesspool conversion and its funding.

1.7 Potential Revenue Sources

Traditional centralized municipal water and wastewater conveyance and treatment plant infrastructure projects generally have a stable revenue source in the form of user fees or general taxing authority that is used to fund system capital and on-going O&M costs. However, many nontraditional projects (such as the cesspool conversion program) lack a stable revenue stream to fund project implementation, special financial assistance programs, and/or on-going permitting, monitoring, and administration. Consideration should be given to leveraging potentially available revenue sources to assist with financing the conversion program. Use of these revenue sources may require legislative action and/or voter approval and may include the following:

- Developer fees.
- Nutrient impact fees.
- Permit fees.
- Property taxes.
- Recreational or license fees.
- Resort taxes/fees.
- General excise tax.
- Special assessments.
- User fees.

1.8 Potential Future Federal Legislation and COVID 19 Stimulus Bills to Track

The Senate Committee on Environment and Public Works approved two partisan bills - America's Water Infrastructure Act (AWIA) of 2020, a broad water infrastructure and water resources bill, as well as the Americas Drinking Water Infrastructure Act of 2020, which together invest nearly $20 billion in wastewater infrastructure projects and community drinking water improvements. AWIA 2020 is anticipated to provide $17 billion in funding for water infrastructure projects, with $2.5 billion in funding for the Drinking Water Infrastructure Act. AWIA reauthorizes the CWSRF fund with increased program funding for the first time in 30 years and increases assistance to struggling communities. In addition, AWIA reauthorizes the WIFIA program through 2024 and the Sewer Overflow and Stormwater Reuse Municipal Grants program and creates the Clean Water Infrastructure Resiliency and Sustainability Program. The bills are currently pending full senate and presidential approval. As appropriations are provided for various provisions, there may be some potential funding opportunities for the cesspool project.

In addition, Congress is discussing a potential COVID-19 Stimulus Package Phase 4 for release in late July/August 2020. While there is some uncertainty on the exact programs to be funded, it is anticipated that a future bill will include funding for public infrastructure projects with a focus on projects that help to kick start the economy, modernize infrastructure, and help build resilience to future crises. It is anticipated that

funding provided through a potential stimulus bill will focus on shovel ready projects, be provided on a first come first serve basis, and are projects that help to kick-start a state's or the nation's economy. The Council of Infrastructure Financing Authorities has proposed the 2020 Save, Accelerate, Fill and Expedite (S.A.F.E.) Water Infrastructure Action Plan which proposes recommendations for the potential COVID-19 Stimulus Bill #4 including an allocation for Hawaiʻi's S.A.F.E. SRF Project Pipeline for Drinking Water projects at $32 million and Clean Water projects at $85.6 million and provides for program allowances including that the Clean Water and Drinking Water SRF programs be provided increased flexibility to achieving goals of the bill by waving requirements for state match for any stimulus funding and the 2020 capitalization grant to allow federal funding to flow immediately. However, the mechanism for disbursement of potential stimulus funding is yet to be determined.

While future legislations both target wastewater infrastructure funding, there is some uncertainty in the ultimate bill and appropriations and neither legislative can be relied upon as a mechanism to fund the entire cesspool conversion program but should be considered as one potential source of funding for the project.

1.9 Summary and Next Steps

The following section provides an overall summary, recommendations, and next steps.

1.9.1 Summary

In light of the lack of dedicated funding mechanism for the conversion of individual cesspool systems, a suite of financing sources has often been utilized in other states. These sourced have included self-financing (either from savings or bank loans), state incentives, and federal/state and local grant/low-interest loan funding. Some states have developed creative approaches for funneling federal and state low-interest loan and grant monies to individual homeowners. State tax credit or potential rebate programs may also provide another financing option for near-term cesspool conversion projects. In addition, some states have established a state-wide, fiscally sustainable funding mechanism for the financing of cesspool conversions.

While the costs of previous efforts to convert LCCs in the state were primarily borne by businesses, the current focus is on the replacement of individual homeowner cesspools which will require financing options that are available to private individuals and can be balanced with household affordability concerns. This TM focuses on potential funding mechanism and models for this purpose.

Financing options for the conversion of cesspools to approved OSWT systems will likely be comprised of a hybrid of financing options depending on several factors including, cost of selected OSWT system, priority of cesspool conversion, stakeholder feedback, and other factors that still need to be identified and assessed. The ideal cesspool conversion financing program would be one that will:

1. **Consider equitability and affordability issues.** Given the high cost of living in Hawaiʻi, the cesspool conversion finance program needs to account for affordability challenges and overall fairness within the community.
2. **Incentivize individual homeowners to convert existing cesspools.** The overall program will be more successful if cesspool owners have an incentive to convert. This process should be coordinated with the public outreach work task.
3. **Provide funding support for upfront cesspool conversion costs.** Homeowners may need funding support to even begin the cesspool conversion process. Consider funding mechanisms that mitigate a homeowner's need to pay all costs upfront.
4. **Consider the funding recipient.** Consider resources that can be paid directly to a homeowner vs. those that must be provided to a public agency, nonprofit, or financial institution and then provided to the homeowner. Financing options which are paid directly to the individual homeowner include

state incentives such as tax credits or rebates, grants from state/federal programs and non-profits and potential new programs modeled after current green energy infrastructure funding models. Financing options where resources must be directed to a public agency, non-profit, or financial institution, include grants and low interest loans from various state/federal programs to be administered by public agencies or non-profits, as well as property-based options including CFDs and SIDs.

5. **Balance the need for immediate, near-, and long-term expenditures.** The time horizon for implementation will also impact the available funding options. In the near-term, pursuit of available federal, state, and local funding sources, e.g. grants and loans, is likely more viable while the reliance on state, county, EPA, or CWSRF funded financing program is recommended for the long-term.
6. **Potentially fund a variety of OSWT options.** In coordination with the cesspool conversion technologies work, the funding may need to support a range of technical, site-specific solutions and a significant range of costs.
7. **Minimize the administrative burden on DOH while providing support to existing or new local agencies.** The funding program will need to account for the additional technical and financial service support to homeowners for cesspool conversions. Consider additional funding for state and local government to administer the program.

Identification of stable revenue sources will be helpful to fund the cesspool conversion program. Potential revenue sources to may include (where applicable):

- Developer fees
- Nutrient impact fees
- Permit fees
- Property taxes
- Recreational or license fees
- Resort taxes/fees
- General excise tax
- Special assessments
- Traditional municipal repayment sources (including user fees and tax/utility revenues)

In Hawaiʻi, adoption of legislation to provide funding, governance, authority, and institutional direction to fund cesspool conversion options has been numerous. However, there is a need to coordinate these legislative initiatives around administration and enforcement policies. Other states, in addition to addressing cesspool funding options, have been successful at passing legislation mandating cesspool conversions under various conditions including in real estate transactions and due to existing cesspool failures.

Based on a review of financing mechanisms utilized by ten other states to incentivize its individual homeowners to convert failing septic or cesspool systems, the key takeaways are as follows:

- The conversion process is a long-term effort that is slow moving and requires the establishment of a comprehensive and extensive public outreach effort.
- The long timeline for implementation also required that states established a sustainable financing mechanism including sources and revenue streams to cover program administration and other costs.
- The most common upgrade and conversion mechanisms instituted by states was the upgrade of the cesspool at the time of a property sale, or if a system failed during inspections or through a blanket phase-out program (as is being implemented in Hawaiʻi).

- Those states with the highest success had implemented extensive outreach programs that educated individual residents on the public health and water quality benefits of converting and provided information on incentives and state programs to help pay for these conversions.
- While each state varied in its program, most provided low interest loans to individual homeowners utilizing CWSRF or other state funds through a conduit/pass through mechanism. Utilizing this approach, the CWSRF programs were able to funnel funding to individual homeowners through a "conduit" or intermediate agency which assumed the loan as well as conducted all required program administrative activities – thereby reducing demands on the state's CWSRF program. Conduit agencies included other state programs, financial institutions or non-profit organizations.

Several financing models implemented in other states may prove to be a good fit in Hawaiʻi, including:

1. Financing program in which DOH CWSRF program partners with another State agency and shares program responsibility.
2. Financing program in which DOH creates a Conduit Lending/Pass Through Program with a public entity (such as the county or an eligible non-profit) in which DOH CWSRF staff are still involved with the disbursements. However, the pass-through entity is responsible for all program administrative activities (loan application, loan processing, project selection, repayments, loan close out etc.).
3. Financing program in which a new financing agency is established to handle the financing (and perhaps other aspects) of the cesspool upgrades and conversion.

In addition, several less traditional funding models have been used in Hawaiʻi by other infrastructure systems (e.g. energy) that may be applicable for cesspool conversions including: on-bill financing (used by HGIA); and Development of CFDs or SIDs which can levy taxes and assessments and issue bonds to provide infrastructure in communities.

Federal and state funding options for cesspool conversions for individual homeowners to finance OSWT systems are limited due to program priorities, and the requirement that the recipient of funding be a public entity or a qualified non-profit. Current funding options for individual homeowners include: Hawaiʻi Cesspool Tax Credits; Office of Hawaiian Affairs Malama Loans; Hawaiʻi Cesspool Remediation and Conversion Program (pending); Hawaiʻi Rural Water Association; and the Hawaiʻi Rural Community Assistance Corporation. In addition, EPA's WIFIA program and Hawaiʻi DOH CWSRF and NPS programs, may be potential funding sources, if a public entity were to be the loan recipient and then funnel loan monies to individual homeowners. Federal programs including USDA's Water and Waste Disposal Loan and Grant and Rural Housing Services Programs, as well as the HUD Non-Entitled Counties in Hawaiʻi Community Block Grants and Economic Development Administration should be further evaluated as potential funding programs as well. These later programs are targeted at rural or low-income communities.

1.9.2 Next Steps

The selected funding mechanism for the cesspool conversions will depend on the overall cesspool conversion program and strategy (e.g. prioritized areas, schedule of conversions, cost of technology to be used), who the funding recipient will be (individual vs a subdivision vs homeowners' association), DOH financial and staffing resources, and other factors. The prioritized list will provide an indication of the schedule of conversions and when dollars will be needed. Ultimately, any funding option will also need to include consideration of affordability since many of the cesspools are in areas of limited income.

The next steps in the initial evaluation of potential funding mechanisms that Carollo is scoped to complete includes:

1. Evaluate affordability issues as well as the equitable distribution of funds (TM02).

2. Present funding options to the DOH to solicit input, identify preliminary list of preferred financing mechanism, and identify considerations/concerns.

Recommendations and potential next steps to support cesspool conversions include:

1. Coordination of legislative efforts, such as:
   a. Extension of Act 120 tax credits beyond 2020 or creation of a rebate program.
   b. Creation of legislation to require that cesspools are disclosed as part of real estate property inspections/transactions.
   c. Evaluation of legislation for establishment and funding of a long-term cesspool conversion financing program.
   d. Evaluation of potential federal legislative actions.
2. Work towards the identification of potential viable financial mechanism through the following actions:
   a. Conduct additional research into preferred options identified by the CCWG.
   b. Outreach to federal/state funding programs to confirm applicability and program requirements, timing, etc.
   c. Follow-up with financing programs to discuss program details to understand the "nuts and bolts" of the programs. As well as identify lessons learned, successes and failures, and what program elements could work in Hawaiʻi.
3. Identify and contact potential agencies, non-profits and financial institutions within the state to determine technical expertise, ability and willingness to conduct administrative activities, what financial mechanisms they could help implement, and other functions they can perform.
4. Conduct discussions with DOH, CWSRF, counties, HUD, USDA, and other identified agencies/non-profits to assess and understand available resources (staff/financial), technical expertise, level of engagement/responsibility desired, and resource requirements.
5. Link preferred funding options to affordability and equitability distribution considerations to provide a complete picture of options and affordability mitigation measures.
6. Work with public outreach subgroup to develop strategies for presenting technology and financing options to groups of affected cesspool owners to solicit input.

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Appendix A

MECHANISMS TO FUND CESSPOOL CONVERSIONS TO CENTRALIZED AND DECENTRALIZED SYSTEM

Pay-As-You-Go-Funding

PAYGO financing involves collection of payments from customers within the utility's jurisdiction through user charges, capital charges, and other sources, for funding future capital improvements. All or a portion of these revenues are accumulated in a capital reserve fund and are used for capital projects in future years. PAYGO financing could be used to finance 100 percent or only a portion of a given project, depending on several factors.

Overall, total costs are substantially lower when employing a PAYGO financing approach due to the avoidance of interest payments incurred from bond funding, along with the associated transaction costs (e.g., legal fees, underwriters' discounts, etc.). However, it is often challenging to employ this funding approach for large new or replacement projects, due to the high amount of capital that is needed on-hand in reserves, or from rate-based cash flow. If the program is reserve funded, the agency must already have sufficient cash-on-hand designated for such a project. If the program is rate funded, it could significantly increase the agency's rates and fees if the program represents a sizeable increase in capital needs. This funding approach also doesn't recognize the inter-generational nature of water and wastewater utility assets which typically provide long-term benefits to multiple generations of ratepayers.

The PAYGO financing mechanism is not a viable mechanism by which to fund the cesspool conversions, as OSWTs will not fall under the jurisdiction of a utility. However, if a cesspool property were to be connected to an existing sewer system for centralized treatment, this may be an option to further explore.

Debt Financing

There are several options for debt financing of wastewater projects, ranging from the issuance of short- or long-term bonds.

Revenue Bonds

Revenue bonds are historically the principal method of incurring long-term debt. This method of debt obligation requires specific non-tax revenues such as user charges, facility income, and other funds, to be pledged to guarantee repayment of bonds. There is often no legal limitation on the amount of authorized revenue bonds that may be issued, but from a practical standpoint, the size of the issue must be limited to an amount where the net revenues available for annual debt service (interest and principal payments) are sufficient to meet bond covenant requirements. Revenue bond covenants generally include coverage provisions, which require that revenue from user fees minus operating expenses be greater than debt service costs by factors typically ranging from 10 to 25 percent, i.e. debt service coverage per the bond covenant is expected to range from 1.10 to 1.25 times.

General Obligation Bonds

General obligation (GO) bonds are municipal securities secured by the issuer's pledge of its full faith, credit, and taxing power. GO bonds are backed by the general taxing authority of local governments and are often repaid using utility revenues when issued in support of a sewer or water enterprise fund. In the event that GO bonds are issued for the cesspool project, the agency must have the necessary taxing capacity to issue the bonds.

Certificates of Participation

Certificates of participation provide financing through a lease agreement that does not require voter approval. The legislative body of the issuing agency is required to approve the lease arrangement by a resolution. The lessee (the public entity) would be required to make payments typically from revenues derived from the operation of the facilities. The amount financed may include reserves and capitalized interest for the period that facilities will be under construction.

Assessment District Bonds

Financing by this method involves initiating assessment proceedings. Assessment proceedings are documents in "Assessment Acts" and "Bond Acts." An assessment act specifies a procedure for the formation of a district (boundaries), the ordering, and making of an acquisition or improvement, and the levy and confirmation of an assessment secured by liens on land. A bond act provides the procedure for issuance of bonds to represent liens resulting from proceedings taken under an assessment act. Procedural acts include the Municipal Improvements Acts of 1911 and 1913. The commonly used bond acts are the 1911 Act and the Improvement Bond Act of 1915. The most prevalent procedure is a combination of the 1913 Improvement Act with the 1915 Bond Act. Charges for debt service can be included as a special assessment on the annual property tax bill. The procedure necessary to establish an assessment district may vary depending on the acts under which it is established and the district size.

The debt financing mechanism for the replacement of cesspools with OSWT is not a viable mechanism as most debt financing options require a public entity as the issuer and the issued must have a mechanism for repayment (e.g. annual property tax bills, utility revenues, etc.).

Grants and Loans

Federal, state and local grant and loan funding sources are available for the planning, design and construction of water, wastewater, and infrastructure projects. Grants and low interest loan funding programs, which are highly competitive, typically target specific types of project and/or have specific objectives that a project must achieve and often require projects to meet as many objectives as possible, including:

- Builds Regional partnerships.
- Incorporates integrated project benefits.
- Water conservation or efficiency.
- Protects groundwater resources.
- Renewable energy improvements or energy efficiency.
- Addresses risk and resiliency.
- Demonstrates consistency with the State and Regional policies and objectives.
- Demonstrates regional cooperation and partnerships with partners and stakeholders.
- Serves a DAC or severely DAC.
- Helps create both construction and post-construction related employment.

Federal and State low interest loans and grant programs have become more competitive due to an overall increased interest in alternate funding programs and federal and state budget constraints. Most programs require a public entity or agency be the applicant or serve as a conduit for funding to private entities. More

so, as funds are limited and highly competitive; the programs require a challenging qualification process; may expire after a specified time; and are not typically a long-term funding solution.

Federal and State low interest loans and grants maybe a viable mechanism for the funding of some cesspool conversions, especially for those in the near-term if they fit a specific programs priority. However, in the longer term, these existing programs do not provide for a reliable steady source of funding of the cesspool conversions due to the competitiveness of the programs, the uncertainty in yearly appropriations and other factors.

Appendix B

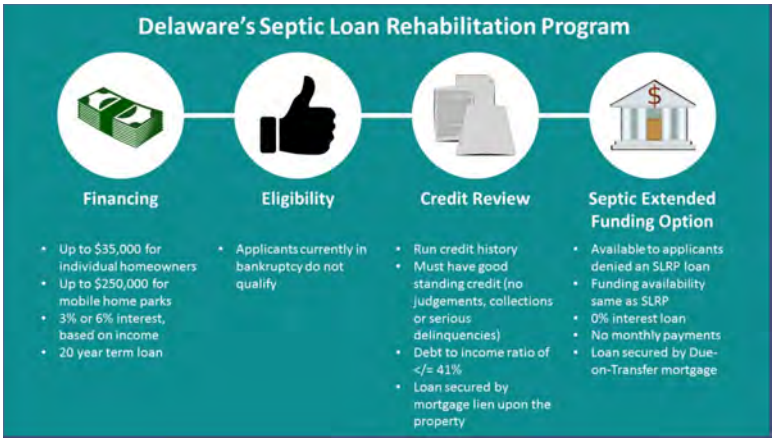
CESSPOOL FUNDING MECHANISMS IN OTHER STATES

Delaware (Program Type: Direct Lending)

Delaware is a coastal state with an estimated 70,000 onsite systems, 18 percent of which are estimated to be failing. Beginning in 2015, cesspools were banned and required to be replaced within one year of identification. The state has a goal to replace 6,074 septic and leach field systems by 2025. The Delaware CWSRF program, through the Delaware Department of Natural Resources and Environmental Control (DNREC), provides direct loans for the repair and replacement of privately owned decentralized wastewater treatment systems, to moderate to low income homeowners, under two programs: Septic Rehabilitation Loan Program (SRLP) and the Septic Extended Funding Option (SEFO).

Septic Rehabilitation Loan Program: The SRLP program provides low interest loans ranging from a minimum of $1,000 up to $35,000 to individual homeowners and $250,000 for mobile home parks. Individual loans have averaged $15,000. Eligible costs include site evaluation, OSWT system design, permits, construction costs and closing/recording costs. Eligible costs for central sewer projects include impact fees, connection fees, permit costs, electrical and abandonment of septic systems. Eligibility requirements include good standing credit (e.g. no judgements, collections or serious delinquencies), the applicant debt: income ratio is greater than or equal to 41 percent; and the loan must be secured by a mortgage lien upon the property. Applicants currently in bankruptcy do not qualify. Under the SRLP program, the loan term is 20 years and the interest rate is based on the applicant's income (ranges from 3-6 percent). There is no pre-payment penalty. Under the SRLP Extended Funding Option, the loan term is 20 years with a 0% interest rate and no monthly payments.

The DNREC established a partnership with the First State Community Action Agency (FSCAA) to assist with the SRLP. The FSCAA manages much of the administrative work associated with providing financial assistance directly to individual borrowers to reduce the burden on CWSRF staff resources, which has been a critical element to the SRLP attaining their goal of replacing 100 failing septic systems each year.



Septic Extended Funding Option – SEFO loans are offered to applicants that are denied an SRLP loan- typically due to poor credit or high debt to income ratio. The SEFO, is funded by an annual CWSRF allocation of $500,000 that comes from a 1 percent fee charged on CWSRF municipal wastewater loans. As with the SRLP program, applicants currently in bankruptcy do not qualify. This program provides the same funding and similar loan terms as the SRLP, however the interest rate is 0 percent and there are no monthly payments. Eligible costs

include site evaluation, design, permits, construction costs and closing/recording costs. The eligibility requirements are similar except the loan is secured by Due-on-Transfer mortgage. While the loans are forgiven after 20 years; if the property is sold or the mortgage refinanced, the principal must be re-paid immediately.

Community Septic System Outreach Program: This program was developed as a partnership between the Community Action Agency and the Delaware Environmental Finance Office to identify low and moderate income homeowners that may need financial assistance to replaced failed and/or failing OSWT systems.

Washington (Program Type: Pass Through/Conduit Lending)

The State of Washington's, Department of Ecology provides funding to local governments to set up low-interest loan programs to repair or replace failing onsite sewage systems through two programs: the RLP), as well as the LLP. Funding for these programs is provided by two sources: Washington's CWSRF and the Centennial Clean Water Fund. SRF funding is used as the primary source of loan financing, while the Centennial Clean Water Fund is used to cover administrative costs, loan losses and grants/subsidies to low-income individuals.

Local Loan Program: The CWSRF program, utilizing a pass-through program mechanism, provides funding to 15 counties or local health departments in the Puget Sound and Marine counties, as well as the Spokane Conservation District through the Local Loan Program. Currently, two counties/ conservations districts act as "pass-through entities" providing sub-loans to individual homeowners for the repair and replacement of septic systems. The county or its health department is responsible for local loan servicing, collecting payments, and payment tracking (but may contract these services to a lending institution). The pass-through entity (county or conservation district) also approves or denies loan requests and establishes the terms of the sub-loans to residents. The pass-through entity is responsible for submitting quarterly progress reports to the CWSRF program providing schedules for project completion, loan marketing activities, data on loan applications and closures, and a final list of local loans provided to homeowners and small commercial enterprises.

Regional On-site Sewage System Loan Program: The RLP, launched in 2016, is a partnership between the Department of Ecology, the Department of Health, local counties and health departments, and Craft3 (a non-profit third-party lender). The RLP program is managed by Craft3, a non-profit financial institution, who was contracted by the Department of Ecology to manage the lending activities on behalf of local governments. Craft3 works with the local authorities to ensure that the proposed repair or replacement is approved, and is responsible for the approval or denial of loan requests, establishing loan terms, the loan servicing, collection of payments, payment tracking, submittal of quarterly reports, loan marketing activities, providing data on loan applications and closures, etc. Ultimately, Craft3 assumes the financial risk associated with lending, and is obligated to repay the CWSRF funds.

Through this program, Craft3 provides Clean Water Loans to both residential and commercial owners to repair or replace failing onsite sewage systems or to abandon systems and connect to the sewer. To be eligible for a loan the septic system must be failing, and funding cannot be used for new developments. The 15-year loan can cover the full cost of designing, permitting, installing and maintaining a septic system and includes a reserve for ongoing inspections and repairs. The loan rates (1.99-4.99 percent) and terms (no monthly payment, monthly interest only or monthly principal plus interest) vary based on the annual household income and occupancy. There are no

income restrictions on eligibility, however more favorable rates/terms are provided for lower incomes. There is an option to extend the loan upon the loan maturing. If a property is sold or transferred, the loan balance if due on sale or maybe transferred to the new owner upon approval. Since the program inception in 1990, $15 million in CWSRF has been provided to the program.

Rhode Island (Program Type: Sub-State Revolving Fund)

Rhode Island is a coastal state and had an estimated 25,000 cesspools (2007) when the state passed a cesspool act to replace the 1,400 highest priority cesspools. It is unclear how many cesspools remain in Rhode Island, however as of 2015, almost 21,000 AIE technologies had been installed (many in new homes). Rhode Island passed the Rhode Island Cesspool Act of 2007 to better protect coastal water quality, groundwater and improve upon wastewater disposal methods. The act required that the state replace cesspools within 200 feet zones near tidal water, drinking water reservoirs and wells. However, the efforts to replace the cesspools was very slow. Ultimately, in 2016, the state passed a cesspool phase out program requiring for the replacement of cesspools on all properties subject to sale or transfer.

To facilitate the identification of priority conversion areas, the EPA awarded the state a $3 million State and Tribal Assistance Grant to create a cesspool conversion strategy/plan or comprehensive wastewater management plan. The state provides town with funds (State Bond funds, federal non-point source fund grants or EPA grants) to develop Onsite Wastewater Management Plans. Upon development of the plan, the town is eligible to apply for the Community Septic System Loan Program.

Community Septic System Loan Program

The State of Rhode Island's CSSLP, launched in 1999, provides low-cost financing to residential property owners for the repair or replacement of substandard or failing septic systems or to replace cesspools when the homeowner wishes to upgrade to a septic system. The program is funded via the Rhode Island Infrastructure Bank (RI I-Bank) which utilizes federal dollars recycled from previous CWSRF loans to provide the source of funds for the CSSLP. Municipalities apply to the Rhode Island I-Bank for a "lending facility", the proceeds of which can be utilized to make direct loans to homeowners. Residents of participating communities can then access the funding through their municipality via RI Housing. When a community has depleted its funding, the community re-applies to the Rhode Island I-bank for additional funds.

Rhode Island Housing serves as the loan servicer the homeowner loans and is responsible for the required administrative activities including: accepting and reviewing home homeowner applications from eligible communities; coordinating payments to septic system installers/homeowners;

collecting loan repayments from homeowners; crediting the homeowner repayments to the principal payment responsibility of the local governmental unit; and providing monthly reports to both the CWSRF program and the local governmental unit.

Under the CSSLP program, both residents and non-owner occupants may borrow up to $25,000 in interest free financing to pay for engineering and system replacement costs for failing septic systems. The CSSLP loan term is for up to ten years. There are no income limits for program participants, however applicants are required to have a debt to income ratio of no more than 45%. The homeowner is responsible for a $300 loan origination fee and a 1 percent annual servicing fee on the outstanding loan balance which is split between RI Housing and Rhode Island I-bank to cover costs associated with servicing the loan. For a homeowner to be eligible for CSSLP funding, a prerequisite is that the community within which the homeowner resides must have an On-Site Wastewater Management Plan which is approved by the Rhode Island Department of Environmental Management (DEM). In addition, the municipality must be on DEM's Project Priority List and be issued a Certificate of Approval. *To date the CSSLP program has provided $12.4 million in loans from since 1999. The program has issued 783 loans with an average loan amount of $15,435.*

Sewer Tie-in Loan Fund Program (STILF)

The Sewer Tie-in Loan Fund program provides homeowners in participating communities a low-cost loan to connect to the local sewer system and abandon their individual septic system or cesspool. Under the STILF program, the Rhode Island I-Bank provides interest free loans of up to $150,000 to sewer system owners. The sewer system owner then directs STILF funds to individual homeowners through RI Housing. The maximum loan for an individual property owner is $10,000, with a term of up to 5 years. Funds cannot be used to connect newly connected homes to sewers or to repair/replace or upgrade existing sewer connections. Upon notification by the sewer system owner that an individual property owner qualifies for the program, RI Housing will process the loan application, cut vendor checks, and process the loan repayments. *To date the STILF program has closed 49 loans for a total of $197,782. The average loan amount was $3,552.*

New York (Program Type: Septic System Replacement Fund)

New York passed the State's Clean Water Infrastructure Act in 2017 which provided $2.5 billion in funding for aging infrastructure and included $75 million to be provided over five years for the State's Septic System Replacement Fund.

Septic System Replacement Fund:

The Septic System Replacement Fund, administered by the EFC, provides funding to participating counties with an annual allocation of funds to replace cesspools and septic systems in New York State. Participating County Health Departments are responsible for the overall administer of the program and work directly with individual residential owners on the application process and grant awards. Counties may provide grants for projects that replace a cesspool with a septic system; installation/ replacement or upgrade of a septic system; or installation of enhanced treatment technologies. Individual property owners are reimbursed for up to 50 percent of eligible project costs (up to a maximum of $10,000) which include design, installation and system costs. Eligibility requirements include: a septic system project must be in a participating county and within a priority geographic area; Single family, two family and small businesses with an existing design sewage flow not exceeding 1,000 gallons per day (gpd); and seasonal or secondary homes may be eligible. New construction on vacant lots are not eligible and the property cannot have any outstanding or open

real property tax liens. The property must be a valid certificate of occupancy or equivalent. Grants are provided on a reimbursement basis, therefore property owners are initially responsible for the total cost of their septic system project.

Each county's Health Departments are responsible for reviewing and evaluating the individual homeowner applications and determining financial assistance awards based on the program criteria. Considerations include: property's location in relation to a water body, impacts to groundwater used as drinking water, and the condition of the property owner's current septic system. Upon notification of grant eligibility, property owners work with the County to submit the application, secure design approval and on contractor selection. Upon completion of construction activities, the Health Department is responsible for verifying the project and authorizing payment.

In addition to the State's Septic System Replacement Fund, individual counties have developed county level funding programs to further entire individual residential owners to transition to the use of new technologies/OSWT systems. Suffolk County, located along the coast, has an estimated 252,000 cesspools and 108,000 other onsite disposal systems. The county identified the need to convert/replace almost 2,600 onsite systems per year based on home sale and developed the Septic Improvement Program to support this effort.

Septic Improvement Grant and Loan Program.

Under the Reclaim Our Water Septic Improvement Program, homeowners who decide to replace their cesspool or septic system with new technologies will be eligible for a grant of up to $30,000 from Suffolk County and New York State to offset the cost of one of the new systems. In addition to the grant, homeowners can qualify to finance the remaining cost of the systems over 15 years at a low 3 percent fixed interest rate. The loan program is administered by Community Development Corporation of Long Island Funding Corp, with financial support from Bridgehampton National Bank, in the amount $1 million and financial commitments from several philanthropic foundations. Eligibility criteria include: residence must be served by an existing OSWT system or cesspool; not be located within a proposed sewer district; not be new construction; have a valid certificate of occupancy and the applicants income should be verified. Suffolk County has approved approximately 550 AIE systems. Currently, the County can award up to 200 grants per year but plans to increase to 1,000 per year.

Maryland (Program Type: Credits and Linked Deposit)

Maryland is a coastal state with an estimated 420,000 septic systems (2009), with 52,000 of these systems being located within critical land areas. With nitrogen being the most serious pollutant in the Chesapeake Bay and Maryland waterways, Senate Bill 320 was passed to upgrade onsite septic systems to remove nitrogen. The emphasis is on the replacement of cesspools and septic systems with AIE technologies that remove nitrogen. Maryland has multiple funding programs for cesspool conversions including the BRF, the Water Quality Trading Program (WQT), and the Linked Deposit Program.

Bay Restoration Fund:

The BRF, created with the passage of Senate Bill 320 in 2004, creates a dedicated fund to finance the improvement of nitrogen, phosphorus, ad nutrient levels. Maryland utilizes two mechanism to fund the program. All municipal sewer customers are charged a fee of either $2.50 or $5 per month (depending on location) which is deposited into an interest earning fund. In addition, for each user served by an OSWT system they are charged a $60 annual fee. The income of the ODSDF is

$27 million per year and 60 percent of the funds o to septic system upgrades and the remaining funds are used for cover crops. BRF funds can be used to finance wastewater treatment plants upgrades to the best available technology for nitrogen removal or to connect existing dwellings to sewer, where public sewer is available. The grants are limited to $20,000 per household and the property owner is responsible for any additional costs over the grant amount. Grants can be applied toward capital facility, user connection, and master plumbing charges. The Clean Water Commerce Act (CWCA) passed in 2017 and expanded the use of BRF to include the costs related to the purchase of cost effective nitrogen, phosphorus, or sediment loading reductions. The amount used for funding is not to exceed $10 million per year in the fiscal year (FY) 2020 and 2021.

Water Quality Trading Program:

The Water Quality Trading Program creates a public market for nitrogen, phosphorus, and sediment requirements. It is a voluntary program that's a collaborative effort between the MDE and the Maryland Department of Agriculture (MDA). The purpose is to accelerate the restoration and protection of the Chesapeake Bay and local waters by promoting upgrades of OSWT systems to generate credits and meet National Pollutant Discharge Elimination System (NPDES) permit requirements. Each county has a specific total maximum daily load goal and can reach these goals by upgrading OSWT systems.

Linked Deposit Program:

The Linked Deposit Program, funded by the Maryland Department of Environment, provides a source of low interest financing for private landowners and water system owners to implement capital improvements to reduce nutrient delivery to the Chesapeake Bay. "Linked" refers to the relationship between below-market rate of interest agreement provided to a participating lender by MDE's WQFA. The below-market rate of interest loan is passed on to the borrower to fund water quality and drinking water capital projects. Participating lenders are accountable for processing, underwriting, and servicing the loan. The bank will evaluate the credit worthiness of an applicant according to the lenders underwriting criteria. The bank assumes all risk of default and the State and MDE are not liable to reimburse a participating bank for any loses or expenses associated with loans from this program. The loan agreement is also between the lender and the applicant, not the State or MDE.

MDE's septic upgrade program annually receives an estimated $8 million in funding, enough to cover about 600-700 septic upgrades per year. An average septic system upgrade, plus five years of maintenance, costs approximately $10,000-$13,000. Since 2006, the State has awarded approximately $19 million to homeowners and counties for upgrading septic systems.

Massachusetts (Program Type: Pass through Lending, Direct Loans, and Tax Credits)

Massachusetts is a coastal state. The number of OSWT systems in Massachusetts is not readily available. In 1996, the Massachusetts Department of Environmental Protection (DEP) recognized failing cesspools and septic systems as a leading cause of water pollution and drinking water contamination.

Community Septic Management Program

Massachusetts established the Community Septic Management Program, in 1996, to provide low cost loans to communities to devise local inspection and septic management plans. The Community Septic Management Program provides communities with low interest loans of up to $200,000 to devise a Community Inspection Plan or a Septic Management Plan. The Local Inspection Plans are

intended to protect environmentally sensitive areas from contamination; while Septic Management Plans identify areas that need monitoring and maintenance. Both plans must include a provision of financial assistance to homeowners through betterment agreements.

Communities, through the local Board of Health, may then provide financial assistance to eligible homeowners for the repair, replacement, or upgrade of failed septic systems or the connection to an existing sewer through a Betterment Agreement. A Betterment Agreement channels loans from the CWSRF program through a municipality to individual property owners for the repair or replacement of septic systems. The interest rate ranges between 3-5 percent based on affordability. Funds may be used to cover all costs necessary to repair or replace a failed septic system, hook up to existing sewer system, or to replace traditional septic systems with alternative systems. To be eligible for funding, a project must be placed on a community's priority list and screened based on environmental/public health impacts, income and funding needs. In general, betterment loans, together with accrued interest, are repaid through the Community's tax collection – as a line item in the property tax bill. If the property is sold, the payments is assumable by the buyer of a property. The municipality can place a municipal lien on property if the homeowner defaults on the loan.

The Community Septic Management Program was funded through a loan from the State Revolving Fund which was offered at 0 percent interest rate to communities via the Massachusetts Water Pollution Abatement Trust. The Massachusetts Clean Water Trust provides up to $5 million a year from the CWSRF program assets to fund municipalities' needs. There is also a $20,000 grant available for first-time communities entering the Program to provide additional funds to assist with administrative costs. The community also has an option to set aside up to 2.5 percent of the loan funds to obtain consulting services to administer the Program. Each community executes an agreement with the Trust describing the terms and conditions of the SRF Loan. The community subsequently re-loans these funds to homeowners. The interest charged on the betterment loans to homeowners provides positive cash flow and additional security for the community. Each community assumes full responsibility for repaying monies borrowed from the Trust. However, the repayment obligation is secured with the betterment agreements made with homeowners.

Homeowner Septic Loan Program

The program is a bank loan program providing low interest loans to eligible homeowners through the Massachusetts Housing Program. The Massachusetts DEP allocated $14 million for financing home septic repairs. The program provides funding to owners with up to 4 family homes in the amount of $1,000 to $25,000 for a loan term of 3-20 years. Interest rates range from between 3-5 percent based on family size, income and market area. The minimum monthly payment is $27. The loans are backed by mortgage security. All loans are due in full upon sale, transfer or refinancing of the first mortgage.

Tax Credit:

The Commonwealth also provides a tax credit of up to $6,000 over 4 years to defray the cost of septic repairs to a primary residence. The tax credit is available for all septic systems and cesspool upgrades and repairs that occurred after January 1, 1997. Forms are provided through the Department of Revenue for homeowners to claim the tax credit.

Since the implementation of the Community Septic Management Program, more than 4,000 systems have been replaced, repaired, or upgraded. Over $22 million in low interest loans have been approved by the Massachusetts Clean Water Trust and the Massachusetts CWSRF program to communities. In addition, repayment through the property tax assessments is a creative revenue source for funding a nontraditional

project. The overall effectiveness of the Community Septic Management Program's implementation depends largely on the initiative of local officials.

New Jersey (Program Type: Direct Loan and Linked Deposit)

New Jersey Department of Environmental Protection's (NJDEP) Environment Infrastructure Financing Program is now known as the New Jersey Water Bank (NJWB). It is a partnership between the NJDEP and the New Jersey Environmental Infrastructure Trust (Trust). The purpose is to provide low cost financing for the design, construction, and implementation of projects that help protect and improve water quality. NJWB financing comes from the Trust and the NJDEP. The Trust issues revenue bonds that are used in combination with zero percent interest funds to provide very low interest loans for water infrastructure projects. The NJDEP uses a combination of federal State Revolving Fund (SRF) capitalization grants and State's matching funds, loan repayments, State appropriations, and interest earned on such funds. To receive funds through the NJWB, a public sponsor must develop a septic management district.

The New Jersey CWSRF Green Project Reserve program and the Municipal Grant Program (MGP) may also provide funding for septic systems. The CWSRF green project reserve is a federally funded program and both public and private owned projects are eligible for financial assistance. Eligible projects include decentralized wastewater treatment solutions including septic tanks. The MGP provides grants from the state to eliminate septic systems and finance new sewer connections. Assistance is available for up to $500 per property and can only be used to assist with the physical cost of connection to the system. New Jersey is in the process of developing a program to invest unexpended capital funds from its CWSRF and put the money to homeowners through a Link Deposit Program. This is similar to the program in Maryland in which the CWSRF program purchases a reduced rate certificate of deposit from a private institution, and the institution then loans out the deposited funds to individuals for smaller scale water quality projects.

Because cesspools must be upgraded during real estate transactions, there is an opportunity for funds to come through the Department of Community Affairs (DCA) community block grants or USDA rural development housing grants.

Ohio (Program Type: Direct Financing)

In 2013, the Ohio Department of Health estimated that 31 percent of septic systems were failing. There are several funding mechanisms available to help fund the conversion of the state's septic systems including: the Water Pollution Control Loan Fund (WPCLF), the Water Resource Restoration Sponsor Program (WRRSP), the State's CWSRF, and the Un-Sewered Area Assistance Program. The Ohio EPA offers three options for direct funding assistance which include: a linked deposit program, a local loan capitalization program, and the Principal Forgiveness loans to the Local Health Districts (LHDs).

Water Pollution Control Loan Fund:

This fund is offered by the Ohio EPA to assist low to moderate income households to repair and replace failing on site treatment systems. WPCLF provides below-market interest loans. Small borrowers are usually eligible for indirect loans through linked deposit programs, while public and large private borrowers are able to secure direct loans. Local government entities can create their own RLF or linked deposit program using a WPCLF loan. In 2019, $10.1 million was provided for the repair and replacement of failing septic systems.

Water Resource Restoration Sponsor Program (WRRSP):

Another program offered by the Ohio EPA, the WRRSP offers communities very low interest rate for wastewater treatment plant improvements as long as the community also sponsors projects to protect or restore water resources. The philosophy of the program is that wastewater treatment plans improvements and water resource restoration efforts are complementary efforts.

Ohio Clean Water State Revolving Fund (CWSRF):

The CWSRF program provides a linked deposit program for individual homeowners that need to upgrade or replace a decentralized system through low-interest loans. The state works with local banks to provide financial assistance at a reduced rate, and the borrower is able to secure a loan at under market rate.

Un-sewered Area Assistance Program:

The Ohio Water Development Authority developed this program to provide grants for the construction of a publicly owned sewer system for areas that are un-sewered and have failing on site treatment systems. This program is available to state and county and public agencies with the authority to manage wastewater or water management facilities in un-sewered areas.

Principal Forgiveness to LHD:

Principal Forgiveness loans are similar to grant funds and are the most popular amongst homeowners in the State. Since 2016, the Ohio EPA has awarded nearly $50 million to Ohio LHDs to be disbursed to eligible homeowners. Annual awards to Local Health Districts range from $150,000 to $300,000. LHDs are responsible for setting area priorities and determining eligibility of residents based on income and the failing on site treatment systems. Homeowners can qualify for 50 percent to 100 percent in principal forgiveness depending on income and status.

Florida (Program Type: Incentives)

Florida is a coastal state which has an estimated 2.6 million onsite septic systems in operation, serving as a means of wastewater disposal for 30 percent of Florida's population. Florida represents approximately 12 percent of the United States' septic systems. The state has shallow groundwater and has had significant water quality issues. In 2008, legislation was passed that mandated the development of a comprehensive nitrogen reduction strategy for on-site systems.

Septic Upgrade Incentive Program

In 2016, the Florida Department of Environmental Protection (DEP) was authorized to issue funds for its Septic Upgrade Incentive Program (Program) pursuant to the Florida Springs and Aquifer Protection Act and resulting Basin Management Action Plans (BMAPs) to develop an incentive program to encourage homeowners to voluntarily remediate existing conventional septic systems and cesspools to include nitrogen reducing enhancements. Eligible enhancements include retrofitting septic tanks with advanced pre-treatment, recirculating aerobic treatment units, or replacing traditional septic tanks with upgraded nutrient-reducing technology.The incentive program offers subsidies, only in designated priority focus areas within a county, in amounts up to $10,000 per system and are designed to offset homeowner costs. Funds are available on a first come first served basis, until funding is exhausted. The subsidies are available for payment directly to septic system installers and licensed plumbers retained by homeowners to update existing conventional systems with enhanced nitrogen reducing features and must be pre-approved by DEP prior to the commencement of work. The Program is contingent upon appropriation by the

Legislature and, if required, an authorized release of the funds by the Legislative Budget Commission. DEP anticipated that program funding would be exhausted by April 17, 2020, for the current FY. It is anticipated that new funding will be available at the start of the new FY beginning on July 1, 2020.

In addition, the Governor's budget includes an earmark for $7.6 million specifically for septic upgrades for homeowners in rural areas where sewer systems are not available.

Texas

Texas is a coastal state with 25-35% of its population served by OSWT systems and approximately 45,000 new onsite systems installed every year. The state has developed a rigorous approval process for propriety and non-standard onsite treatment systems. Most of the current grant programs in Texas do not provide assistance to individual homeowners, however some do fund local and regional projects that may include septic system assistance. Some programs include:

Texas On-Site Sewage Facility Grant Program (TOGP):

TOGP gives competitive grants to support applied research and projects for on-site wastewater treatment technology and systems. This grant is funded from a fee collected for each on-site sewage facility (OSSF) permit issued.

319 Nonpoint Source Program:

This program cleans and prevents pollution caused by runoff from urban and nonagricultural nonpoint sources. Nonprofit organizations and state agencies are eligible, but individuals may not apply for direct funding.

Supplemental Environmental Projects (SEPs):

The SEPs are from the Texas Commission on Environmental Quality that includes programs that help homeowners with septic systems among other environmental projects. Project types can either be a contribution where the respondent contributes to a pre-approved SEP performed by a third party, custom where the respondent performs the project using their resources, or compliance where an eligible local government may correct the violation alleged in the enforcement or remediate environmental harm.

Minnesota (Program Type: Conduit Lending)

Small Community Wastewater Treatment Program

The Minnesota Public Facilities Authority (PFA) administers the Small Community Wastewater Treatment Program to provide financing to replace non-complying septic systems and straight pipes with new individual or cluster subsurface sewage treatment systems that are publicly owned, operated and maintained. To be eligible for financing, applicants must be a city, county, township, sanitary district or other governmental subdivisions that has a project ranked on the Minnesota Pollution Control Agency's (PCA's) Project Priority List (PPL). Projects are funded in priority order, as established by the PCA. The entity receiving financing must own the subsurface sewage treatment systems (SSTS) systems built under the program. Each property owner seeking to participate in the program must provide a utility easement to the entity to allow access to the system for maintenance and repairs.

Program funding, appropriated from the State's Clean Water Fund, via the Clean Water, Land and Legacy Amendment, provides for:

1. Technical Assistance Grants - Technical assistance grants of up to $60,000 are available to communities to contract with licensed SSTS professionals, counties, the University of Minnesota on-site sewage treatment program, or qualified nonprofit organization to: conduct preliminary site evaluations and prepare feasibility reports, provide advice on possible SSTS alternatives, and help develop the technical, managerial, and financial capacity to build, operate, and maintain SSTS systems.
2. Construction Loans/Grants - Construction financing is available for costs (design, construction, land acquisition and related legal fees) associated with replacing a non-complying system with publicly owned subsurface sewage treatment system. PFA will provide construction financing of up to $2 million per year at a 1% interest rate and grants of up to 80 percent based on affordability criteria. Disadvantaged communities may also qualify for 50 percent principal forgiveness (grant). The construction loan term is for up to 20 years, but not to exceed the design life of the systems. Loan repayments must begin no later than two years after the loan is awarded.

All unsewered communities seeking CWSRF funding for decentralized systems are required to establish a user charge system to pay for operation and maintenance costs associated with the system including development of:

- Financing Plan that provides a dedicated source of revenue for debt service and operation and maintenance (typically special assessments or user charges).
- Management Plan including a schedule for inspections, pumping, repair and replacement activities.

Alternatives analysis using the Wastewater Treatment Hierarchy "Wastewater Hierarchy" where the focus is on small, acute problem areas before deferring to a larger infrastructure solution to correct environmental or public health issues.

Appendix C

POTENTIAL FEDERAL AND STATE FUNDING SOURCES FOR HAWAIʻI

Current funding options for cesspool conversions for individual homeowners or groups of homeowners to finance OSWT systems are limited and typically consist of property assessments, tax credits and low-interest loans and grants from various Federal, State and community-based agencies. The following is a summary of federal and state funding options that can be used to fund cesspool conversion projects, but many require a public entity be the primary applicant.

Federal Funding

There are several highly competitive federal grant and low loan programs that provide financial resources that may be viable opportunities.

Environmental Protection Agency

Clean Water State Revolving Fund Programs

The CWSRF program is a federal-state partnership that provides communities with a source of low-cost financing for a wide range of water quality infrastructure projects. With the passage of the WRRDA Amendments, the CWSRF program eligibilities were greatly expanded, including the ability of the CWSRF program to provide financial assistance for the construction, repair and rehabilitation or replacement of decentralized wastewater treatment systems, as well as the ability for the program to provide financial assistance to any qualified non-profit entity, as defined by the administrator, to provide assistance to owners and operators of small and medium publicly owned treatment works. In addition, CWSRF programs may now provide assistance for the construction, repair or replacement of decentralized wastewater treatment systems that treat municipal wastewater or domestic sewage. CWSRF funding can be provided to public entities, such as municipalities, county governments, and state agencies, private and non-profit organizations.

CWSRF Loan Assistance Programs have considerable flexibility in their funding mechanisms and can set the conditions for loan assistance, an authority that can be exceptionally helpful in financing nontraditional eligibilities, such as cesspools, including:

- Loan maturities can range up to 30 years or useful life of the project.
- Repayment schedules can be structured to meet the needs of the borrower.
- Interest rates can vary from market rates to zero percent.
- Ability to target lower interest rates to DACs to incentivize a variety of goals such as nonpoint source projects, green projects, and the use of innovative technologies.
- Source of repayment does not have to be the project itself, any dedicated source of revenue can be used to repay a NPS loan.

The CWSRF program can be used to finance a variety of projects through various funding mechanisms. Selection of the mechanisms is based on the type of project, repayment source and depends on decisions made by State programs. The federal EPA delegates the CWSRF program authority to each State.

Water Infrastructure Finance and Innovation Act

The EPA's WIFIA established in 2017 provides a new financing mechanism for water and wastewater infrastructure projects. WIFIA provides low interest rate financing for the planning/design and or construction of large dollar-value water and wastewater projects. Eligible projects include:

- CWSRF and Drinking Water SRF eligible projects.
- Projects for enhanced energy efficiency at drinking water, wastewater and recycled water facilities.

- Brackish or seawater desalination project, an aquifer recharge project, water recycling project.
- Acquisition of property if it is integral to the project or will mitigate the environmental impact of a project.
- Bundled SRF projects submitted under one application by an SRF program.
- A combination of projects secured by a common security pledge.

Projects must cost no less than $20 million (or $5 million for small community projects) or an entity may bundle a group of projects together totaling a minimum of $20 million. The program provides a maximum loan not exceeding 49 percent of the project costs. The interest rate is equal to the US Treasury rate of a similar maturity plus a point. The loan term is for 35 years, with the option to defer repayment by 5 years. Unlike the SRF program, the WIFIA program has an "application fee" which ranges on average from $300,000-$500,000, which reconciles the cost associated with processing the loan.

The WIFIA application process is a two-step process, agencies are asked to submit a Letter of Interest which is reviewed by the EPA and evaluated based on the program priorities and on a set of scoring criteria. The EPA will invite selected project applicants to submit a formal application package. It is with the formal application that the applicants are requested to provide an initial application fee of $100,000 and upon entering a financing agreement borrowers are asked to reimburse the EPA for processing costs.

Non-Point Source Section 319 Grants

Under section 319 of the Clean Water Act, EPA provides grants to states to control nonpoint sources of pollution from a variety of sources such as agricultural runoff, mining activities, and malfunctioning onsite septic systems. The EPA encourages each state to use the funds to restore and protection the priority water body types including surface and groundwater. While all Section 319(h) funding decisions are made by the states, projects must be identified in the state's non-point source management plan. States submit their proposed funding plans to EPA. Some, but not all, states use these grants to construct, upgrade, or repair onsite systems. Note that individual homeowners are not eligible to directly receive grant assistance through this program, as the grants are typically provided to watershed organizations that are actively implementing watershed-based plans to restore impaired waterbodies. The federal appropriations vary year to year. In FY 2019, the total appropriation for the program was $165.4 million was allocated for the program. States are required to use 50 percent of their allocation for watershed projects, and the remaining funds can be used for non-point source projects. Recipients of the grant are required to provide a 40 percent non-federal match and projects must be completed within 5 years of grant award.

In Hawaiʻi, non-point source grants are administered through Hawaiʻi's Clean Water Branch Polluted Runoff Control Program, which is under the Hawaiʻi State Department of Health. In the 2015-2020 Hawaiʻi Nonpoint Source Management Plan, cesspool wastewater was identified as a source of non-point source runoff impacting the state's resources and identified the need to develop statewide strategies that address water quality protection and runoff from cesspools, agriculture and urban areas. The PRC Program typically issues a Request for Proposal on an annual basis. Grant recipients are required to provide a 25 percent non-federal match. The State has recently invested in cesspool replacement projects in Kauaʻi (Hanalei Bay watershed) with Section 319 funding, and there are plans to invest in additional cesspool replacement projects in the following years.

United States Department of Interior, Bureau of Reclamation

The USBR WaterSMART program, Reclamation provides cost shared financial assistance to states, tribes and local governments to help them plan and implement projects to increase water supply through investments to modernize existing infrastructure. WaterSMART funding opportunities include: Title

XVI/WIIN grants, Water and Energy Efficiency Grants, Drought Program, Basin Study, Desalination, and CWMPs.

United States Department of Interior, Bureau of Reclamation – Title XVI Program (Title XVI Authorized and WIIN Authorized Projects)

Reclamation administers funds for recycled water feasibility, demonstration, and construction projects through the Water Reclamation and Reuse Program authorized by the Reclamation Wastewater and Groundwater Study and Facilities Act of 1992 (Title XVI) and its amendments. The program provides as much as 25 percent of construction costs with a maximum of $20 million. To meet eligibility requirements a project must have a feasibility study, comply with environmental regulations, and demonstrate the ability to pay the remainder of the construction costs. Projects are authorized by Congress and recommended in the President's annual budget request by the USBR. Congress then appropriates funds and the Bureau ranks and prioritizes projects and disburses the money on a competitive grant basis each year. Prioritized projects are those that postpone the development of new water supplies, reduce diversions from natural watercourses, and reduce demand on federal water supply facilities, or that have a regional or watershed perspective.

United States Bureau of Reclamation - Drought Resiliency Program

Reclamation administers two grant programs under the Drought Resiliency Program.

- **Drought Contingency Planning:** Provides grant funds for the development of Drought Management Plan or for an agency to update an existing drought plan with grant awards of up to $200,000.
- **Drought Resiliency Projects:** USBR provides funding for the implementation of projects that build long-term resiliency to drought and reduce the need for emergency response actions that are identified in a Drought Management Plan. Projects eligible for funding should address at least one the following: serve to increase the reliability of water supply; improve water management; implement systems to facilitate voluntary water sales, transfers, or exchanges; and provide benefits for the environment are eligible. Types of projects include moving pipelines, small recycling, storage reservoir construction, and projects that increase flexibility in drought. The Drought Resiliency Grants provide as much as 25 percent of construction costs with a maximum of $300,000 for projects completed in two (2) years and $750,000 for projects that are completed in three (3) years. $20 million. To meet eligibility requirements a project must have a drought management plan, comply with environmental regulations, and demonstrate the ability to pay the remainder of the construction costs.

United States Bureau of Reclamation WaterSMART Small-Scale Water Efficiency Projects

Under the WaterSMART grants program, Reclamation provides a dedicated source of funding to fund small on the ground implementation projects to support water planning. USBR anticipates making $2 million available in Federal funding available in 2019. The total project cost should be capped at $150,000 and grant funding will include a 50/50 cost share with the total Federal funding limit of $75,000. Projects need to be completed within 2 years of grant award.

United States Bureau of Reclamation - WaterSMART: Water and Energy Efficiency

Through the WaterSMART Water and Energy Efficiency Grants program, Reclamation provides a 50/50 cost share funding to irrigation and water districts, Tribes, States, and other entities with water or power delivery authority. Eligible projects include projects that result in quantifiable and sustained water savings, increase renewable energy use and improve energy savings, and support broader water quality sustainability benefits. Projects that benefit endangered and threatened species, support water sustainability benefits, or

implement activities to address climate related impacts on water may apply. Projects are selected through a competitive process and the focus is on projects that can be completed within 24 months that will help sustainable water supplies in the western United States. There are two funding limits for the program: $300,000 (typically for projects completed within a year; and up to $1,000,000 (for projects to be completed in 3 years). The total earmarked for this program in FY 2019 was $34 million.

United States Department of Interior, Bureau of Reclamation – Cooperative Watershed Management Program

Through the CWMP, Reclamation provides funding to watershed groups to encourage stakeholders to form local solutions to address water management needs. Funding is provided on a competitive basis for:

Watershed Group Development and Watershed Restoration Planning: This funding provides funding for the development of watershed groups, watershed restoration planning, and watershed management project design (Phase I). Eligible applicants include states, Indians, tribes, local and special districts, local government agencies and non-profit organizations. As part of Phase I activities, applicants may use funding to develop bylaws, a mission statement, complete stakeholder outreach, develop a watershed restoration plan, and watershed management project design. For this funding program, Reclamation will award up to $50,000 per year for a period of up to two years (total of $100,000) with no non-Federal cost-share required.

Implementation of Watershed Management Projects: Under this program, Reclamation provides cost-shared financial assistance to established watershed groups to implement watershed management projects. These on-the-ground projects, collaboratively developed by members of a watershed group, address critical water supply needs and water quality concerns, helping water users meet competing demands and avoid conflicts over water. Reclamation will award up to $300,000 per project. Applicants must contribute at least 50 percent of the total project costs.

United States Department of Commerce – Economic Development Administration

Public Works and Economic Adjustment Assistance Programs

The EDA provides grants for public works projects provide grant funding for public works projects, including wastewater and stormwater projects that promote economic development. The EDA through its Public Works and Economic Adjustment Assistance Program will provide support assistance with up to 50 percent in matching funds (up to $3 million) based on the number of permanent jobs created by the implementation of the proposed project. For every full-time job created, the EDA will provide $10,000 in EDA assistance. In order to apply a community, County or region must have a current Comprehensive Economic Development Strategies plan. The public entity would have to provide an economic impact statement demonstrating the anticipated growth associated with the project implementation as part of the application process. All construction projects are expected to be completed within 5 years from the date of award. Applications are accepted on a rolling basis. The EDA has published the FY 2020 Public Works and Economic Adjustment Assistance Programs Notice of Funding Availability and is soliciting applications in rural and urban areas. There are no submission deadlines and applications will be accepted until all funds have been expended.

United States Department of Agriculture

Water & Waste Disposal Loan and Grant Program

The USDA provides funding directed at low-income and or small water/wastewater utilities. USDA provides Predevelopment Planning Grants which assist low-income communities with the initial planning and development of applications required for USDA Development Program requirements include: 1) Population must be less than 10,000 people; and 2) Median household income below the poverty line or less than 80 percent of the statewide non-metropolitan median household income. Maximum grant amount of

$30,000 or 75 percent of the predevelopment planning costs. Twenty-five (25) percent cost share from applicant or third-party sources.

The Water and Waste Disposal Loan and Grant Program provides direct loan/grant and loan guarantees for clean and reliable drinking water systems, sanitary sewage disposal, sanitary solid waste disposal, and stormwater drainage. Eligible applicants include most state and government entities, private non-profits and federally recognized tribes. Eligible areas include rural areas and town with populations of 10,000 or less. Funds may be used to finance the acquisition, construction or improvement of sewer collection, transmission, treatment and disposal systems. Loans have a 40-year payback period, based on the useful life of the facilities. The interest rate is based on the need for the project and the median household income of the area to be served.

Rural Housing Service

Under the Rural Housing Service Program, USDA offers a variety of programs to build or improve housing and essential community facilities in rural areas. To ensure decent, safe and affordable housing remains available, USDA Rural Development can provide assistance through home repair loans and grants to remove health and safety hazards or make a home accessible for household members. Funds can be used to repair or replace furnaces, appliances, electrical, foundations, siding, roofing windows, plumbing, wells, septic systems and other health and safety hazards. Loans are available up to $20,000 at a one percent fixed interest rate for up to 20 years. Seniors age 62 and older, who do not have repayment ability for a loan, may be eligible for a loan and grant combination to make needed repairs and improvements. The maximum lifetime grant amount is $7,500. Funds can cover all upfront and construction costs, including septic system designs, permits and installations. Program eligibility is based on household income that cannot exceed 50 percent of the area median income and the property must be located in a rural community.

Rural Economic Development Loan and Grant Program

The Rural Economic Development Loan and Grant program provides funding for rural projects through local utility organizations. USDA provides zero-interest loans to local utilities which they, in turn, pass through to local businesses (ultimate recipients) for projects that will create and retain employment in rural areas. The ultimate recipients repay the lending utility directly. The utility then is responsible for repayment to USDA. USDA provides grants of up to $300,000 to local utility organizations which use the funding to establish RLFs. Up to 10 percent of the grant funds may be applied toward operating expenses over the life of the RLF. Loans are then made from the RLFs to project sponsors (up to 80 percent of project costs). First time loans are provided at 0 percent interest, subsequent loans may incorporate interest rates or administrative loan fees. When the RLF is terminated, the grant is repaid to USDA. Program eligibility is based on household income that cannot exceed 50 percent of the area median income and the property must be located in a rural community.

United States Department of Housing and Urban Development – Community Development Block Grants (CDBG)

The HUD awards discretionary funding through various programs including the CDBG program. The CDBG program, authorized under Title 1 of the Housing and Community Development Act of 1974, provides grant funding to communities to develop viable urban communities by "providing housing and a suitable living environment, and by expanding economic opportunities". HUD provides annual funding to states, which then allocates money to local communities in the form of CDBGs.

CDBG Entitlement Program

The Entitlement Community CDBG Program provides federal funding to entitled cities and counties to carry out a wide range of community development activities directed at revitalizing neighborhoods, economic development, and providing improved community facilities and services. Entitled communities are defined as those cities with a population of greater than 50,000 and counties with populations of greater than 200,000. Funding is provided to entitled communities to meet housing and community development needs. Entitlement communities develop their own programs and funding priorities. However, maximum feasible priority must be provided to projects that benefit low- and moderate- income persons. In addition, funding maybe allocated for activities, if the grantee certifies that the activities meet other community development needs having a particular urgency because existing conditions pose a serious and immediate threat to the health or welfare of the community where other financial resources are not available to meet such needs.

CDBG Non-Entitled Counties in Hawaiʻi Program

HUD administers the Non-Entitled CDBG Program in for the state of Hawaiʻi and allocates funds on a formula basis using population, poverty and housing overcrowding as a basis for allocating funds. The FY 2004 Appropriations Act requires that HUD administer the program in Hawaiʻi in the same manner that it administers the CDBG Entitlement Grant Program. The Non-Entitled CDBG Grants in Hawaiʻi offer a source of funding to benefit community needs in but not limited to economic development, housing rehabilitation, public facilities, construction or installation for the benefit of low- to moderate-income persons. HUD's Honolulu Field Office directly administers the CDBG Program for non-entitlement counties in the State of Hawaiʻi.

In Hawaiʻi three counties qualify for this program - Hawaiʻi, Kauaʻi and Maui. Non-entitled communities are defined as cities with a population of less than 50,000 and counties with populations less than 200,000. Many of the programs are similar to that of the entitlement program with grants for community development activities directed at neighborhood revitalization, infrastructure, economic development and improved community facilities and services. Like the entitlement project, eligible activities include construction of public facilities and improvements, such as water and sewer facilities, and streets, public services, activities related to energy conservation and renewable resources, etc. No less than 70 percent of the funds must be used for activities that benefit low- and moderate-income persons over a period specified by the state, not to exceed 3 years. In order to receive CDBG funds, non-entitlement CDBG grantees must submit a Consolidation Plan (the jurisdictions comprehensive planning document) to the Honolulu field office. *To utilize this program, the County's would need to agree to use their CDBG funds towards this purpose.*

Section 108 Loan Guarantee Program

Section 108 Loan Guarantee Program (Section 108) provides CDBG recipients the ability to leverage their annual grant allocation to access low-cost, flexible financing for economic development, housing, public facility, and infrastructure projects. Communities can use Section 108 guaranteed loans to either finance specific projects or to launch loan funds to finance multiple projects over several years. Section 108 can fund economic development, housing, public facilities, infrastructure, and other physical development projects, including improvements to increase resiliency against natural disasters. Section 108 assistance can be deployed in two ways:

- Directly by the community or its governmental or non-profit partner to carry out an eligible project
- Indirectly with a community or its partner re-lending (or, in limited circumstances, granting) the funds to a developer or business to undertake an eligible project

The loan amounts are based on the entities latest CDBG amount received and capped at five times the amount minus any outstanding Section 108 commitments. The maximum loan repayment period is 20 years and the interest rate varies based on the treasury yield.

State Funding Options

The following is a summary of current and potential state funding options for cesspool conversions. The focus of the funding options review was limited to those options available for individual homeowners or groups of homeowners to finance OSWT systems and typically consist of property assessments and low-interest loans and grants from various State and community-based agencies. Funding options to connect to a county of private wastewater system are not included below.

Hawaiʻi State Department of Health Clean Water State Revolving Fund Program

The CWSRF Program has existed since 1988 when the State legislature passed Act 365 which was superseded by HRS Chapter 342-D Part V. This program provides financing for the construction of water pollution control projects necessary to prevent contamination of groundwater and coastal water resources and to protect and promote the health, safety and welfare of the citizens of the State of Hawaiʻi. It also provides low interest loans to county and State agencies to construct point source and nonpoint source water pollution control projects. Loan terms for this program include terms of no more than 30 years; annual interest rate of 0.25 percent and a semi-annual loan fee of 0.5 percent. Terms are fixed over the life of the loan and proceeds can be used for planning, design and construction activities. Loan proceeds fund up to 80 percent of project costs and require a 20 percent non-federal match.

Since the program was established in 1988, approximately $875.40 million in low interest loans have been provided to counties in the State to fund water quality improvements. In Federal Fiscal Year (FFY) 2019, the State was expected to receive $12.3 million for additional loans. The program includes a Green Project Reserve of 10 percent which is reserved to fund green infrastructure. For FY 2019, this set aside was approximately $1.23 million.

This fund has been used to support the closure of LCCs in the State and DACs are specifically targeted for this program. The requirements for the fund have been modified to address the needs of individual cesspool owners, homeowner associations and nonprofit organizations so that they have access to loans to fund new decentralized systems to replace cesspools.

Applicability for Cesspool Conversions: This a viable funding program for cesspool conversions, however the administrative workload on CWSRF staff will need to be addressed.

Hawaiʻi Rural Community Assistance Corporation (RCAC)

Public agencies, tribal governments, and nonprofits in the State are eligible to apply for this program which has been in existence for 35 years. Eligible projects include water, wastewater, solid waste and storm water facilities that primarily serve lower-income rural communities. Individual homeowners will likely need to create SIDs to apply for this source of funding. "Green lending" includes a prioritization component whereby applicants indicate water and energy savings giving them higher funding priority.

Feasibility, pre-development, and construction projects are eligible. Feasibility efforts are typically not more than $50,000 and a typical term is 1 year. Pre-development projects such as engineering, legal and bond counsel efforts are typically not to exceed $350,000 and the term is 1 year. Maximum loans for construction funding is $3M. Loan terms are up to 20 years; 5.0 percent for the first 10 years and subject to change for longer term loans. Loan fees are 1.0 percent.

RCAC has funded water projects on Maui and Oʻahu.

Applicability for Cesspool Conversions: This a viable funding program for cesspool conversions for lower income rural communities.

Hawaiʻi Rural Water Association (RWLF)

The State association is a chapter of the Rural Water Association and provides funding to infrastructure projects targeted at replacing equipment, providing system upgrades and completion of small projects including energy efficiency, sustainability and disaster recovery projects. Current loan terms include interest rates of 3.0 percent and a repayment periods of 10 years. Loan amounts are typically less than $100,000 or 75 percent of total project costs, whichever is less. There are no administrative fees. Eligible systems must be public entities (municipalities, counties, special purpose districts, Native American Tribes, non-profit corporations and cooperatives) serving up to 10,000 people.

Applicability for Cesspool Conversions: This a viable funding program for rural communities. However individual homeowners will likely need to create a SIDs to apply for this source of funding.

Proposed Hawaiʻi Cesspool Remediation and Conversion Loan Program

State SB 2850/HB2540/SB 221 introduced legislation in 2018 that would create a specific program for cesspool remediation and conversions. This program is envisioned to provide low-interest loans to cesspool owners for the upgrade or conversion of cesspools to aerobic treatment unit systems in each county. The loan program would include an on-bill financing option supported by funding from the water pollution control revolving fund. In 2019 SB 221 was passed to establish a similar loan program, effective July 2019. This program was to be implemented through the Counties in coordination with DOH.

Applicability for Cesspool Conversions: It is not clear whether this program has been implemented.

Office of Hawaiian Affairs Malama Loans

The mission of the Office of Hawaiian Affairs (OHA) is: "To enhance access for all persons of Native Hawaiian ancestry to credit, capital and financial services and skills so as to create jobs, wealth, and economic & social well-being for all the people of Hawaiʻi." To support their mission OHA provides loans and grants for Native Hawaiian businesses and individuals.

The Malama Home Improvement Loan is available in amounts ranging from $2,500-$100,000. Loans over $20,000 must be secured by non-real estate assets. Current terms are 5-6 percent interest and up to a 7-year loan period. Loan applications must include: Proof of Hawaiian ancestry and Hawaiʻi residency; Contractor's estimate of the work; 2 years federal tax returns and W-2s; and 1 month current pay stubs.

While this program has limited eligibility, i.e. not all cesspool homeowners are Native Hawaiian, it may be a financing option for those who do qualify. The state may consider evaluating funding options tied to Native Hawaiian ancestry through organizations like Bishop Estate and the Department of Hawaiian Home Lands to assist the native Hawaiian community. This approach could already be available through Federal programs such as HUD.

Hawaiʻi Cesspool Tax Credits, State Income Tax Credit (Act 120)

Hawaiʻi currently provides a state income tax credit for qualified cesspool owners upgrading to a septic system, aerobic treatment unit, or connecting to a sewer. Qualified cesspools are cesspools that are: located

within 500 feet of a shoreline[14], perennial stream or wetland[15], or within a source water assessment program area[16]. A list of cesspools (identified by tax map key and county) that already meet the criteria of Act 120 is available on the DOH website[17].

A taxpayer may apply for a tax credit of up to $10,000 for documented expenses associated with upgrading each qualified cesspool. Under the current law, tax credits are available for five years (tax years 2016-2020), ending on, December 31, 2020. The state provided a maximum of $5,000,000 of credits that are available for each tax year. Any taxpayer who has upgraded a qualified cesspool but is not eligible to claim the credit in a taxable year because the cap has been reached shall be eligible to claim the credit in the subsequent years. As of February 2020, House Bill 1723 which extends the tax credit from December 31, 2020 to December 31, 2025 was progressing through the legislature, passing the Second Reading and referred to committee for further deliberations.

While this program has several financial advantages for those homeowners who file state income taxes, there are likely many homeowners who are below the threshold for filing state income taxes and therefore are not able to take advantage of this option. Given that only 47 applications have been filed for this credit[18], this incentive may have limited appeal and application to current cesspool owners. This challenge will be addressed in the Affordability Analyses in a subsequent TM.

While the tax credits help to offset some construction costs associated with the conversion, it does not provide:

- Relief for the on-going maintenance and management of the new OSWT option.
- Relief to low-income customers who do not earn enough to qualify for this credit.
- Relief in upfront costs to retain assistance from a licensed civil engineer.

In addition, depending on the selected OSWT, the credit may only cover a fraction of the cost borne by the homeowner. Pending legislation may extend the term of this program, however an assessment of the accessibility by all homeowners to this incentive should be considered and other mechanisms identified.

[14] Hawai'i Administrative Rules §13-222-2
[15] Hawai'i Administrative Rules §11-54-1
[16] As determined by the Department of Health based on a two year time of travel from a cesspool to a public drinking water source
[17] https://health.hawaii.gov/wastewater/home/taxcredit/
[18] Number of filings from 2015-2017.

Appendix D

POTENTIAL CWSRF FUNDING MECHANISMS FOR NON-TRADITIONAL PROJECTS

The following is a summary of potential mechanisms by which the State CWSRF programs can provide financial assistance through the counties or other public entities to individual residential owners.

Direct Loans:

CWSRF programs are able to make direct loans to any municipality, inter-municipal, interstate, or state agency for construction of publicly owned treatment works. Additionally, in some cases, CWSRF programs can make direct loans to private borrowers under certain circumstances.

Co-Financing:

Local communities can use a variety of state and federal funding sources to help co-finance infrastructure improvements. Funding sources, such as the EPA, USDA, USBR, HUD, and other State funding programs, often offer opportunities to co-fund projects with the CWSRF program. Co-financing projects is useful for large projects that cannot be entirely funded by the State's CWSRF program, or if there are project costs that may not be eligible under CWSRF but are eligible under other programs.

CWSRF programs can also enter into a co-financing arrangement with other state agencies and programs, allowing the program to leverage existing relationships and mechanisms by which to award and disburse funding. Several states have used this approach to reach borrowers for NPS projects by partnering with state agricultural offices that already have an existing relationship with landowners.

Partnerships:

Many types of partnerships are possible in the CWSRF program, which can allow the program to extend the reach of the program to fund projects that might otherwise not be in a position to receive CWSRF assistance. The Delaware CWSRF has entered into master lease/purchase agreement with another state agency to fund necessary infrastructure improvements including a wetland remediation. The CWSRF is the lessor and the state agency is the lessee under a memorandum of understanding with the CWSRF loan provided in the form of a lease paying project and repayments are in the form of rental payments.

Conduit/Intermediary Lending

The following is a summary of two mechanisms for conduit/intermediary lending.

Pass through Lending

Pass-through lending distributes CWSRF funds through a conduit entity/agency to an end borrower. Conduit entities include state agencies, counties, conservation districts and local municipalities. The benefits of a pass-through lending approach includes:

- Conduit entity (e.g. county) is frequently able to bundle several sub-loans and complete the CWSRF application requirements for all of them, reducing the administrative burden on individual end borrowers as well as the CWSRF program.
- As the conduit organization is the loan guarantor, a pass-through arrangement provides a more secure financial capability assurance for the CWSRF program as opposed to making loans directly to the small, untested end borrowers.
- A pass-through structure makes it possible for CWSRF subsidies, such as principal forgiveness, to reach non-municipal, nontraditional projects via the eligible public pass-through partner, who can then channel the savings through to a private or nonprofit end-user.

Linked Deposit

Linked deposit financing takes advantage of a provision in the CWSRF authorizing statute allowing CWSRF funds to be used "to earn interest on fund accounts". In a linked deposit arrangement, a state CWSRF

program purchases a reduced-rate certificate of deposit from a private financial institution. The financial institution then loans out the deposited funds (at a slightly lower interest rate) to individuals for smaller-scale water quality projects. Other states have used linked deposits to successfully fund projects such as septic replacements, agricultural best management practices, or environmentally friendly forestry equipment. This mechanism allows the individual end borrowers to work directly with their own financial institutions instead of the CWSRF program. Financial institutions earn a fee that compensates them for administrative the loans. The financial institution is responsible for reviewing and approving applications from the end borrowers (as well as collecting payments), removing much of the administrative burden that would otherwise fall to the CWSRF program.

Sponsorship Lending

CWSRF programs can combine assistance to both traditional and nontraditional projects in the same loan agreement (e.g. traditional public treatment works project with a non-point source project). This allows user fees from the traditional portion of the project to serve as a repayment stream for the nontraditional project. Typically, a municipality receives a loan with a reduced interest rate as compensation for undertaking/ "sponsoring" a nontraditional project thus allowing municipalities to address pressing watershed restoration or water quality protection priorities without placing a repayment responsibility on NPS projects. For added incentive, a CWSRF could further reduce the interest rate so that the municipality would save money rather than break even.

Programmatic Financing

Programmatic financing shifts traditional project-specific lending strategy to one that is designed to fund the utility's entire capital improvement plan (CIP) (or any portion thereof) so long as the projects are eligible and in compliance with CWSRF program requirements. This can also encompass non-point source projects (stormwater, green infrastructure, and restoration projects) that are eligible and included as part of the CIP. The focus is on the schedule and pace of disbursements for a "package" of projects on an annual basis under a single loan agreement. With programmatic financing, if a project in the CIP is delayed or falls through, the funding can be directed towards other eligible project activities in the CIP. This approach has been used successfully in Minnesota and Rhode Island for a number of years, and is currently being implemented in Hawaiʻi.

Portfolio Lending

Portfolio Lending is a strategy to commit funding over time to one or several projects identified in a CIP or watershed management plan. Both options can easily accommodate nontraditional projects. Portfolio lending requires careful cash-flow management to ensure that program funds are not over-extended, but can provide a valuable level of certainty to a CWSRF program's project pipeline. While the borrower must still complete the CWSRF application process to receive a loan each year, they have the assurance that the state revolving fund (SRF) will have the financial capacity to fund the project.

Capital Improvement Plans

With CIP Portfolio Lending, the CWSRF program commits to fund a certain portion (or all) of a municipality or utility's CIP over time, assuming each project meets eligibility and priority criteria. This helps to develop borrowing relationships to ensure stable demand for CWSRF funds and contributes to the municipality's long-term planning efforts. If nontraditional projects are included in the CIP, they can be financed at the same time instead of trying to finance as standalone projects.

Watershed Management Plan

With a Watershed Management Plan approach, there is a higher priority placed on funding projects that address water quality on a watershed basis. The planning and implementation activities associated with watershed management projects lend themselves well to a portfolio funding approach that encompasses numerous projects in various stages through a multi-year lifespan.

Intermunicipal Lending

In Intermunicipal Lending, an intermunicipal agency is established by two or more municipalities, which is then eligible for CWSRF assistance. The agency can facilitate cross-jurisdictional coordination and funding support for regional solutions to water quality problems. The assistance recipient could be a single entity within the agency or the agency itself and would be ultimately responsible for the implementation of the portfolio of projects eligible for CWSRF assistance. It is also important to note that a CWSRF can provide authorized assistance to intermunicipal agencies, including loan guarantees for "sub-state revolving funds." However, the cooperation and coordination required in the development, funding and implementation of "joint' projects might be a challenge.

For example, the Missouri CWSRF provided a $1 million loan to the MACOG to capitalize the Missouri On-Site Wastewater Improvement Grant-Loan program. This pass-through arrangement provides financing for homeowners to repair or replace on-site wastewater treatment systems. The program provides a 50 percent/50 percent low-interest loan and grant for low-income homeowners or a 60 percent/10 percent/30 percent low-interest loan/grant/homeowner match for non-low-income homeowners. While MACOG coordinates the entire program and holds the loan agreement with the CWSRF program, the program is administered by the nineteen individual regional planning commissions and councils of government throughout Missouri for customers in their jurisdictions.

Planning and Design Lending

CWSRF programs can also provide planning and design low interest loans and grants. In some states, the planning and design loan becomes interest-free or is forgiven if the borrower pursues CWSRF construction financing. Loan forgiveness is particularly helpful to nonpoint source projects. For example, in the state of Arizona, the WIFA administers the CWSRF program and uses a portion of their fee revenue to fund a planning and design program aimed at providing much needed assistance to communities with limited resources who need help in completing this kind of work. This funding is capped at $35,000 per project with a 40 percent local match.

Purchasing Local Debt Obligations

Clean Water Act Title VI allows states the opportunity to provide assistance through the purchase or refinancing of local debt obligations. For example, States may purchase general obligation or revenue bonds issued by municipalities, inter-municipalities, and interstate agencies at or below market rates, so long as such debt obligations were incurred after March 7, 1985. In terms of financing nontraditional projects, the purchase of local debt presents a viable alternative for intermunicipal borrowers, interstate agencies, public private partnerships (P3), and nontraditional projects with longer useful life expectancies including, but not limited to, land purchases, conservation easements, and watershed restoration efforts.

Credit Enhancements

With a credit enhancement program, a highly-rated CWSRF program guarantees third-party debt (such as a bond issue) for a municipality or utility with a weaker credit rating. The guarantee agreement between the CWSRF and the assistance recipient results in more favorable borrowing terms for the recipient, allowing the entity to take advantage of interest rates similar to what it might receive on a traditional CWSRF loan. At the

same time, this arrangement allows the CWSRF program to stretch its assistance capabilities further since a guarantee does not require the same cash outlay as a traditional loan. This form of assistance has not been widely used among CWSRF programs.

CWSRF Bond Issuance

The following are two types of bonds that could be issued by the CWSRF program to help finance the cesspool conversions.

Traditional Bonds

The sale of bonds by or on the behalf of the CWSRF programs has produced a tremendous boost in the assistance provided by SRF programs. Since 1989, 29 CWSRF programs have leveraged their programs in this manner, issuing approximately $42 billion in bonds to finance eligible projects. CWSRF bonds can be sold to finance traditional projects, nontraditional projects, or both. There is not a lot of experience in the marketplace for the sale of bonds to finance only non-traditional projects. To issue bonds, the CWSRF program must have the capacity (e.g., free cash flows and debt service reserve if necessary) to enter into debt, secure it, and make debt service payments. Equally important is a sufficient pipeline of projects that are ready to proceed; therefore, the demand for nontraditional projects should be carefully assessed along with their readiness to proceed before bonds are issued.

Green Bonds

"Green Bonds" are municipal bonds issued with a commitment to direct proceeds exclusively toward environmentally beneficial purposes. Although the terminology is new (coined in 2008 by the World Bank), the concept is tried-and-true for CWSRF programs that have leveraged funds, since the proceeds from leveraged bonds have always been used for projects benefitting the environment. For the most part, Green Bonds are typically issued with the same pricing and terms as the issuer's standard bonds, but may be marketed to different investors

Appendix B

Technical Memorandum 2:
AFFORDABILITY EVALUATION FOR CESSPOOL CONVERSIONS
(November 2020)

Hawai`i State Department of Health
Cesspool Conversion Finance Research

Technical Memorandum 2
AFFORDABILITY EVALUATION FOR CESSPOOL CONVERSIONS

FINAL | November 2020

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Hawai`i State Department of Health
Cesspool Conversion Finance Research

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AFFORDABILITY EVALUATION FOR CESSPOOL CONVERSIONS

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Abbreviations

ACS	American Community Survey
ALICE	Asset Limited, Income Constrained, Employed
ATU	aerobic treatment unit
Carollo	Carollo Engineers, Inc.
CBG	census block group
CCWG	Cesspool Conversion Working Group
COVID-19	Coronavirus Disease 2019
DOH	Department of Health
FPL	Federal Poverty Level
GIS	Geographical Information Systems
HM	hours of minimum wage
Legislature	Hawai'i State Legislature
mgd	million gallons per day
MHI	median household income
O&M	operations and maintenance
OSWT	onsite wastewater treatment
TM	technical memorandum
USEPA	United States Environmental Protection Agency
UV	ultraviolet
WWTP	wastewater treatment plant

Technical Memorandum 2

EXECUTIVE SUMMARY

ES.1 Introduction

Throughout the State of Hawai'i, there are approximately 88,000 cesspools, releasing an estimated 53 million gallons per day (mgd) of wastewater to the environment. Most of the existing cesspools provide wastewater disposal for single family residences, as opposed to large-capacity systems serving multiple residences or commercial areas. Given that over 90 percent of the state's drinking water supplies are from groundwater sources, cesspools pose a potential environmental and public health risk.

In 2017, the Hawai'i State Legislature (Legislature) passed Act 125, which states that by January 1, 2050 all cesspools in the state, unless granted exemption, shall upgrade or convert to a septic or aerobic treatment unit (ATU), or connect to a sewer system (Act 125, 2017). The Legislature then passed Act 132 in 2018, which established a Cesspool Conversion Working Group (CCWG) to develop a long range, comprehensive plan and commission a statewide study of sewage contamination in nearshore marine areas (Act 132, 2018). The CCWG retained Carollo Engineers, Inc., (Carollo) to provide expertise on onsite wastewater treatment (OSWT) technologies as well as cesspool conversion funding, finance options, and affordability.

As a result of Act 125, cesspool owners will be required to upgrade their existing cesspools to an OSWT technology that complies with environmental and public health regulations. The cost associated with cesspool conversions will likely be a financial burden to many residential owners in a state where the cost of living is already high. The Legislature tasked the CCWG to develop a strategy to aid the funding and financing of the cesspool upgrades. The purpose of this technical memorandum (TM02) is to evaluate the affordability issues associated with the requirements of Act 125. A previous TM (TM01) summarized potential funding mechanisms that may be applicable to provide financial support to homeowners for their cesspool upgrades.

ES.2 Purpose and Limitations

The purpose of this TM is to evaluate the potential financial impacts on cesspool homeowners that must upgrade to an approved OSWT system. In addition, this TM provides an evaluation of the overall affordability of cesspool conversions based on industry standards and local financial measures.

It should be noted that this is a preliminary affordability evaluation, and that the CCWG is engaged through other focus areas, such as public outreach where valued feedback is considered. This evaluation was completed based on publicly available information and did not include public input. Future public outreach and education are planned as a part of the overall cesspool conversion strategy development under separate contracts.

Other considerations that may have impacts to the affordability evaluation include exemptions to cesspool conversion (at the discretion of the Department of Health [DOH] per Act 125), or changes to the priority areas and definitions. Ongoing efforts under separate contracts are underway to study available cesspool data validation and prioritization. If new information or guidance on cesspool priority areas is developed, the affordability evaluation should be revisited.

ES.3 Potential Financial Impact of Cesspool Conversions on Homeowners

This TM considers the potential monthly financial impacts of cesspool conversions on individual homeowners. Many homeowners will require some type of financial assistance to convert their cesspools to an approved OSWT technology. Depending on the financing option and OSWT technology selected, the cesspool conversion project could result in financial impacts to the residents ranging from approximately $94 to $339 per month as shown in Table ES.1. The table summarizes the potential costs to homeowners for a range of cesspool upgrade options. The "low" scenario represents the simplest and most straightforward cesspool upgrade to a septic tank system. The "average" and "high" scenarios represent typical and more complex cesspool upgrades, respectively for the purposes of this affordability analysis.

Table ES.1 Summary of Potential Monthly Financial Impacts to Cesspool Homeowners

Cost Description	Cesspool Conversion Cost Scenarios		
	Low	Average	High
Installation Cost(1)	$10,000	$23,000	$38,000
Monthly Installation Repayment Cost(2)	$61	$139	$230
Monthly O&M Cost(3)	$33	$71	$109
Estimated Total Monthly Cost	$94	$210	$339

Notes:
(1) Based on historical installation costs for septic tank and ATU treatment and disposal systems from DOH. The low costs represent the 10th percentile, and the high costs represent the 90th percentile. All conversion costs are site specific and these costs may not be representative for more complex sites/installations.
(2) Based on 20-year loan at 4.0 percent interest rate.
(3) Monthly operations and maintenance (O&M) costs are estimated with the low cost representing septic tank operations costs. The high cost represents a higher level of treatment with ATU + UV disinfection + seepage pit. The average operations cost is the average of the low- and high-end values.

The total low costs are comparable to the monthly sewer bill for a customer connected to a centralized public wastewater system in the state.[1] However, most homeowners will be required to pay more than the comparable monthly sewer bill to convert a cesspool to an alternative OSWT technology.

ES.4 Affordability Analysis

The affordability analysis compared the range of cesspool conversion costs to various measures of affordability, including federal poverty, and median household income (MHI) levels.

In addition, the analysis includes a scenario evaluating the potential impacts of a hypothetical $10,000 rebate program. This scenario was included to evaluate how some level of financial relief would improve the affordability of cesspool conversions. Certainly, there are many more scenarios of financial relief that can be evaluated in coordination with future policy decisions. This scenario was intended to be only one example.

The affordability analysis used total cesspool conversion costs, which include the cost to replace the cesspool with an approved OSWT technology and the cost to operate and maintain the new OSWT. The analysis does not net out any maintenance costs (e.g. routine pumping) that a homeowner currently incurs for an existing cesspool.

Although there are a number of methodologies that have been suggested as guidance for affordability of water and/or wastewater services (some of which are described herein), this analysis primarily relies on the

[1] The typical monthly sewer bill for an average household ranges from $40 to $111 depending on the location within the state.

traditional financial capability assessment guidelines established by the United States Environmental Protection Agency (USEPA). Under this guidance, a household is considered "cost burdened" when wastewater services exceed 2 percent of household income (USEPA, 1997). These households who will be required to convert to an alternate OSWT technology with income below the Federal Poverty Level (FPL) were also identified and considered.

Figure ES.1 illustrates the estimated number of residents financially burdened by the cesspool upgrade cost by county without and with a $10,000 rebate based on the USEPA 2 percent criteria. This analysis shows that 97 percent of residents with cesspools across the state would be financially burdened by the need to fund cesspool conversion and maintain the new OSWT. This decreases to 85 percent if each cesspool homeowner could receive a $10,000 rebate for conversion.

Hawai'i County has the greatest projected financial impact, with the costs of cesspool conversion without a rebate exceeding 2 percent of the MHI for all census block groups containing cesspools. Hawai'i County also has 48,303 cesspools, more than three times as many as any other county in the state.

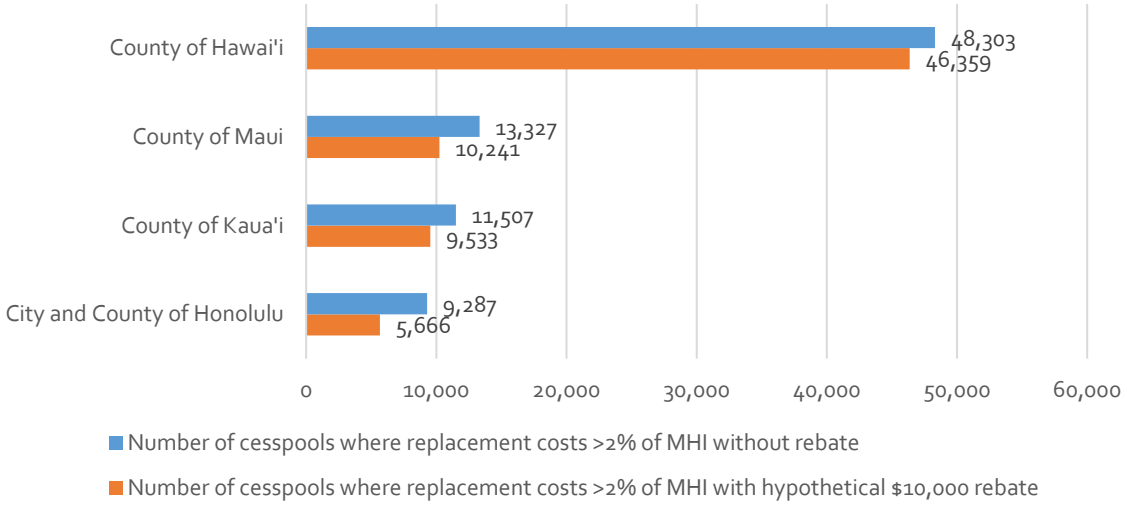

Figure ES.1 Number of Residents with Cesspools Projected to be Financially Impacted by Cesspool Conversion Costs with and without the Rebate[(1)(2)(3)]

Notes:
(1) Assumes average cesspool conversion cost scenario of $210 per month.
(2) Assumes all homeowners can obtain a hypothetical rebate of $10,000.
(3) MHI = median household income

Figure ES.2 shows the income distribution for residents with cesspool by county, based on the median household income for Census Block Group of the cesspool. The same affordability threshold amounts are shown as previously described along with the FPL. Looking at the county level, significant disparities appear in the income distribution. Hawai'i County, which has the largest share of cesspools, has 69 percent or 33,185 residents with cesspools with an income between $40,000 and $80,000 per year. By comparison, over 80 percent or 8,903 residents with cesspools in the City and County of Honolulu have an income above $80,000 per year. Residents with cesspools with incomes greater than $80,000 encompass 53 percent (6,444 residents with cesspools) for Maui County and 48 percent (6,479 residents with cesspools) for Kaua'i County.

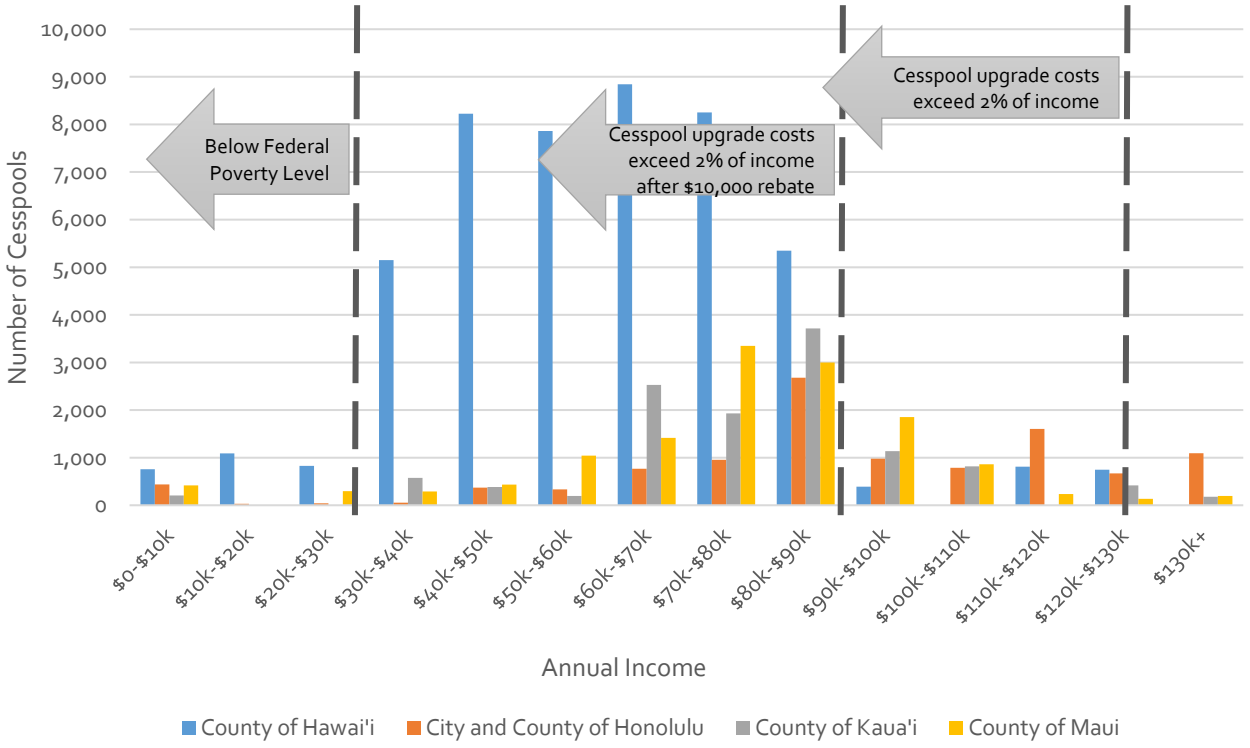

Figure ES.2 County Median Household Income Levels and Estimated Conversion Cost as Percent of Annual Income[(1)]

Notes:
(1) Assumes average cesspool conversion cost scenario of $210 per month.

ES.5 Summary and Conclusions

Many residents with a cesspool will struggle to afford the conversion and ongoing system O&M costs required by Act 125. These challenges appear to be most acutely felt in Hawai'i County, where income and poverty levels indicate the greatest number of households projected to need assistance. However, these challenges are also felt by a significant number of residents with cesspools across the state as well.

There are two basic ways to increase affordability: 1) either through reducing the monthly cost; or 2) providing direct funding support. The state could investigate both options as ways to increase the number of cesspools replaced as part of this program. To reduce monthly costs, low-interest loan programs can help households with a stable but insufficient income to afford cesspool upgrades. Households living below the FPL have the greatest need for direct funding support. The number of residents with cesspools in these categories are shown in Table ES.2 by county and statewide. Table ES.2 also shows the number of residents with cesspools that fall below the 2 percent MHI threshold with and without a hypothetical rebate. To address environmental and public health concerns, direct funding could also be prioritized for cesspools located in high priority, sensitive ecological, or drinking water source areas. This will enhance the effectiveness of the program and help reach established environmental goals.

Table ES.2 Summary of the Residents with Cesspools by County Based on Key Affordability Criteria[1]

Affordability Measure	County of Hawai'i	County of Kaua'i	County of Maui		City and County of Honolulu	Statewide
			Maui	Moloka'i		
Number of Households with Cesspools Below Federal Poverty Level[2]						
Below Federal Poverty Level	3,254	204	416	297	512	4,683
Number of Households with Cesspools Where Conversion Cost Exceeds 2 Percent Median Household Income[2]						
With $10,000 Rebate	46,359	9,533	9,000	1,241	5,666	71,799
Without $10,000 Rebate	48,303	11,507	11,888	1,439	9,287	82,424

Notes:
(1) Affordability analysis was for the average scenario with $23,000 cesspool upgrade costs, and monthly costs of $210 if the cesspool conversion is financed over 20 years at 4 percent interest.
(2) Federal poverty level is $30,718 annual income.
(3) The 2 percent of median household income threshold is $126,125 annual income based on the USEPA definition of "cost burdened".

To determine the amount of financial assistance that may be needed, it is also important to consider the portion of the cesspool conversions costs that *can* be afforded by homeowners. With the exception of those with estimated annual income below the FPL, it was assumed that homeowners could afford to privately finance an amount that results in a monthly payment less than or equal to 2 percent of their estimated monthly income less the average monthly maintenance cost for the selected replacement technology. If that amount is less than the average of conversion costs, it is assumed the difference would require financial aid. Table ES.3 summarizes the estimated amount of conversion costs that can be afforded or privately financed versus the amount of financial aid that may be required. It is anticipated that more than $900 million in financial aid is required to support cesspool conversions for homeowners who are financially burdened.

Table ES.3 Estimated Private Financing and Financial Aid Required for Cesspool Conversions[1]

Priority	Total Private Financing[2] ($ million)	Total Financial Aid Required[3] ($ million)
1	$89.8	$106.5
2	$94.2	$239.3
3	$164.7	$256.3
4	$557.6	$440.1
Totals	**$906.3**	**$1,042.2**

Notes:
(1) Based on average conversion cost of $23,000.
(2) Assumes residents can afford up to 2 percent of estimated household income for cesspool conversions, financed at 4 percent interest over 20 years.
(3) Assumes cesspool conversion costs in excess of 2 percent of estimated household income will require financial aid. Residents with income levels below the federal poverty limit are assumed to require financial support for all conversion costs.

Technical Memorandum 2

AFFORDABILITY EVALUATION FOR CESSPOOL CONVERSIONS

2.1 Introduction

Based on the 2004 *Clean Watersheds Needs Survey Report to Congress*, 62 percent of the residents in the state of Hawai'i are served by centralized wastewater treatment facilities, and the remaining 38 percent are served by decentralized or OSWT systems. There are approximately 110,000 OSWT systems, including 88,000 cesspools and over 21,000 septic systems in the state.

The USEPA defines a cesspool as an underground excavation that receives sanitary wastewater from bathrooms, kitchens, and washers. Figure 2.1 is a schematic diagram of a typical cesspool. Cesspools are designed to capture wastewater solids but are not designed to provide wastewater treatment or nutrient removal. The structure usually has an open bottom and perforated sides. Domestic wastewater flows into the structure and the solid waste collects at the bottom, while the liquid waste flows out to percolate into the subsurface that may be hydraulically connected to groundwater and surface water.

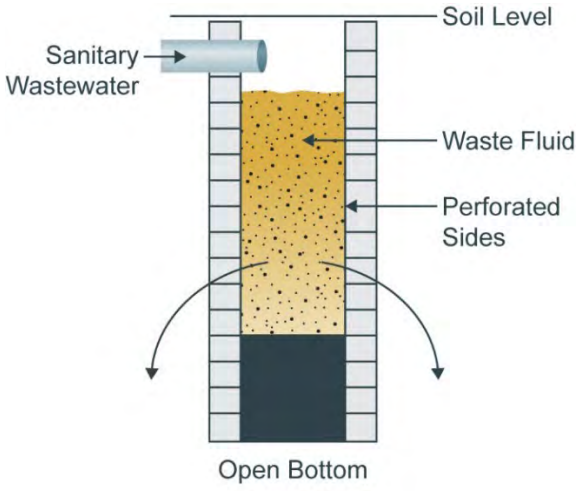

Figure 2.1 Cesspool Schematic

Most of the existing cesspools in Hawai'i serve single family residential units and are spread out through the state. Table 2.1 summarizes the estimated number of cesspools by county, as well as the estimated total wastewater discharged by cesspools. Of these, 43,000 cesspools have been identified as posing a risk to the state's water resources, with 31,000 of these located within the perennial watersheds on the counties of Hawai'i, Kaua'i, Maui, and Moloka'i (DOH, 2018).

Table 2.1 Estimate of Cesspools and Total Anticipated Discharge by Island[1]

Island	Estimated Housing Units	Estimated Number of Cesspools	Estimated Cesspool Effluent (mgd)
Hawai'i	82,000	49,300	27.3
Kaua'i	29,800	13,700	9.5
Maui[2]	65,200	12,200	7.9
Moloka'i[2]	3,700	1,400	0.8
O'ahu[3]	336,900	11,300	7.5
Total	**517,600**	**87,900**	**53.0**

Notes:
(1) Confirmation of the actual number of cesspools, locations, and priorities is being conducted under a separate task of the CCWG.
(2) Maui and Moloka'i are within Maui County.
(3) O'ahu includes all the City and County of Honolulu.

In total, these cesspools are estimated to discharge 53 mgd of untreated sewage to the groundwater system and coastal waters. Untreated wastewater from cesspools contain nutrients (nitrogen and phosphorous) and pathogens such as bacteria, protozoa, and viruses, which can have an impact on drinking water, water quality in streams, rivers, and other receiving water bodies, and the health of the state's reefs and the health of Hawai'i's residents and visitors.

In 2017, the Hawai'i State Legislature passed Act 125, which states that by January 1, 2050 all cesspools in the state of Hawai'i, unless granted exemption, shall upgrade or convert to a septic system or aerobic treatment unit (ATU), or connect to a sewer system (Act 125, 2017).

To incentivize "early adopter" cesspool conversion, the state of Hawai'i established a temporary tax credit program in 2016 under Act 120. Act 120 provided a $10,000 tax credit to homeowners for the upgrade of qualifying cesspools and is set to expire on December 31, 2020.

Act 132 was passed in 2018 to establish the CCWG to develop a long range, comprehensive plan and commission a statewide study of sewage contamination in nearshore marine areas (Act 132, 2018). Act 132 directed the DOH to evaluate residential cesspools in the state, develop a report to the legislature that includes a prioritization method for cesspool upgrades, and work with the Department of Taxation on possible funding mechanisms to reduce the financial burden on homeowners. The CCWG retained Carollo to provide expertise on cesspool conversion technologies and funding and finance options.

As a result of Act 125, homeowners will be required to upgrade their existing cesspools to approved technologies. The CCWG recognized that the cost associated with the conversion will be a significant financial burden to individual residential owners. One of the complex challenges tasked to the CCWG is to develop a strategy to aid the funding and financing of the cesspool conversions.

Figure 2.2 shows a stepwise approach to guiding cesspool homeowners through the conversion process. The CCWG and key advisors are developing the overall strategy to the cesspool conversion program, including public outreach, treatment technologies, data validation and prioritization, and finance research. The information on funding mechanisms provided in TM01 and the information on the affordability of cesspool conversions for homeowners provided in this TM02 is intended to support step #5 shown in Figure 2.2. However, there is a significant amount of strategy, planning, and coordination that will be completed by the CCWG and others over the next few years.

Figure 2.2 Stepwise Approach to Cesspool Conversions for Homeowners

Historical costs to upgrade a cesspool to an approved OSWT and disposal system (e.g. septic system or ATU followed by soil absorption system) range widely from approximately $9,000 to $60,000 or more depending on system capacity, technology, location or site constraints, and size of dwelling unit[2]. With 88,000 cesspools requiring upgrades, total upgrade costs could range between $880 million to more than $5.3 billion.

While there are low-interest loan and grant funding opportunities from federal, state, and local financing sources, these sources combined fall significantly short of what is required to fully fund all conversions. In addition, most of the financing programs are available only to government entities, such as state agencies or counties, and are not targeted and in most cases unavailable to private, residential property owners. This is further complicated by the fact that state agencies and the counties do not currently have the staff or the administrative capabilities to receive grant or loan funds; review and process individual homeowner applications; disperse the funds to the homeowners; and, in the case of loans, conduct follow-up payment collection.

Incentivizing residents to convert existing cesspools will be challenging. Despite the benefits of improving public health and the environment, there are currently no immediate state mandates[3] or regulatory drivers to incentivize conversions and there are few financial incentives for homeowners to convert or upgrade their systems. Cesspools are generally very low-cost and there are minimal maintenance requirements. Significant challenges to the successful conversion of the state's cesspools includes:

- Identification of individual residential incentives.
- Identification of sustainable funding mechanisms for the financing of capital expenditures, long-term costs associated with the maintenance and management of OSWT systems, and overall program administration.
- Identification of funding mechanisms that consider homeowner affordability as well as DOH and/or county administrative workload.

In addition to financial incentives, there is a need to identify and quantify the benefits (e.g., economic, environmental, water quality, etc.) to be gained from converting cesspools that can be communicated to individual homeowners to further incentivize the homeowners to convert.

[2] Based on cost data from DOH. See Appendix A.
[3] The cesspool conversion deadline in Act 125 is January 1, 2050.

2.1.1 Method of Cesspool Conversion

There are generally three options for cesspool conversions:

- **Connection to existing or new centralized sewer systems.** In the large municipal areas of Hawai'i, homes and businesses are connected to county or privately-owned sewer collection and treatment systems, where wastewater flows to a centralized facility for treatment and disposal. Centralized sewer collection and treatment systems are generally cost efficient because of economies of scale. These facilities treat the wastewater either for discharge or for water reuse applications. However, new connections typically must pay significant capital investment fees required by counties or private developers to connect to the centralized system, and connections to centralized systems may not be feasible for many cesspool conversions.
- **Connection to decentralized sewer systems.** Decentralized sewer systems (also "cluster" wastewater systems) are similar to centralized sewer systems, but typically have a smaller collection system service area and wastewater treatment facility. Decentralized treatment can range from passive treatment with soil dispersal to more sophisticated, mechanical treatment, such as membrane bioreactors.
- **Conversion of cesspools to approved OSWT and disposal systems.** Approximately 38 percent of the households in Hawai'i are served by decentralized or OSWT and disposal systems, including cesspools (USEPA, 2008). Since many of the cesspools are in rural areas without centralized or decentralized wastewater systems, conversion to approved OSWT and disposal systems may be the most cost-effective option for some homeowners compared to centralized and decentralized treatment options.

2.1.2 Purpose and Limitations

The purpose of this TM is to evaluate the potential financial impacts on cesspool homeowners that must upgrade to an approved OSWT system. In addition, this TM provides an evaluation of the overall affordability of cesspool conversions based on industry standards and local financial measures.

It should be noted that this is a preliminary affordability evaluation, and that the CCWG is engaged through other focus areas, such as public outreach where valued feedback is considered. This evaluation was completed based on publicly available information and did not include public input. Future public outreach and education are planned as a part of the overall cesspool conversion strategy development under separate contracts.

Other considerations that may have impacts to the affordability evaluation include exemptions to cesspool conversion (at the discretion of DOH per Act 125), or changes to the priority areas and definitions. Ongoing efforts under separate contracts are underway to study available cesspool data validation and prioritization. If new information or guidance on cesspool priority areas is developed, the affordability evaluation should be revisited.

The affordability analysis in this TM includes a scenario assuming all cesspool homeowners can utilize a hypothetical $10,000 rebate to reduce cesspool conversion costs. It is acknowledged that additional funding and alternatives scenarios can be evaluated to determine what policy decisions would assist homeowners with cesspool conversion affordability. To streamline this affordability evaluation, two approaches to defining cesspool conversion affordability were used. However, there are many ways to define affordability thresholds as it relates to wastewater services and cesspool upgrades. Other affordability definitions and thresholds can be considered in future evaluations.

2.2 Potential Financial Impacts of Cesspool Conversions on Homeowners

Traditional water and wastewater infrastructure projects generally involve significant expenditures which provide benefits to a community which share in those costs. Cesspool conversion is a significant expenditure with limited, immediate benefit to an individual homeowner. Nevertheless, families are likely to bear the cost of conversion and on-going maintenance without any way to help recover these costs. While addressing affordability of the cesspool conversions for homeowners it is important to clearly understand not only the cost of the conversion, but also the potential impacts of financing options. A previous TM (TM01) evaluated potential alternative financing mechanisms. The affordability analysis is based on a single financing approach.

The cost of cesspool conversion includes up-front construction/installation and ongoing O&M costs. Cesspool conversion costs to an approved OSWT system (e.g., septic tank system, ATU, or other approved technology) have ranged from $9,000 to $60,000 with an average of $23,000, based on historical installation costs provided by DOH (see Appendix A). These large cost ranges illustrate that there are many factors involved in the cost of a cesspool retrofit which can include type and size of the system, different site conditions (soil type, access, slope, etc.), different material costs, and different market conditions (e.g. number of available contractors). Such data show that it is challenging to come up with a "typical" cost, because there are so many variables – basically each project is different and generalizing costs is very difficult.

Depending on wastewater treatment and disposal options, the annual O&M cost can vary from $400 (septic tanks) to $1,300 (ATU, ultraviolet (UV) disinfection, and seepage pit). Annual O&M costs for septic tanks includes inspection and pumping of the septic tank approximately once per year. The upper range of annual O&M costs include power and maintenance costs for ATU + UV disinfection + seepage pit (Babcock et al, 2019).

Table 2.2 summarizes anticipated monthly homeowner financial impacts using the mid-range financing terms for a home equity loan. The ranges are based on the average cost of $23,000 for installation, with low and high cost scenarios of $10,000 and $38,000 based on the 10th and 90th percentile cost estimates, respectively (see Appendix A). O&M costs are based on a range from $400 to $1,300 per year, with an average of $850. There can be variations in the financing term and interest rates that are possible, however, the installation costs are assumed to be financed over 20 years at 4.0 percent, based on current market rates for home equity loans as of July 2020.

The costs shown in Table 2.2 are total cesspool conversion costs, which include the cost to replace the cesspool with an alternative OSWT technology and the cost to maintain the new OSWT. Any existing maintenance costs that a cesspool owner pays on the existing cesspool have not been considered.

Table 2.2 Summary of Potential Monthly Financial Impacts to Cesspool Homeowners

Cost Description	Cesspool Conversion Cost Scenarios		
	Low	Average	High
OSWT Installation Cost (total)(1)	$10,000	$23,000	$38,000
Interest rate (percent)(2)	4.0	4.0	4.0
Loan Term (years)(2)	20	20	20
OSWT Installation Cost (monthly)(2)	$61	$139	$230
Estimated O&M Cost (monthly) (3)	$33	$71	$109
Estimated Monthly Cost	**$94**	**$210**	**$339**

Notes:
(1) Based on historical installation costs for septic tank and ATU treatment and disposal systems from DOH. The low-end costs represent the 10th percentile, and the high-end costs represent the 90th percentile. All conversion costs are site specific and these installation costs may not be representative for more complex sites/installations.
(2) Installation costs are assumed to be financed over 20 years at 4 percent based on market rates for home equity loans as of July 2020.
(3) O&M costs are based on $400 (assuming a septic tank) to $1,300 per year (assuming ATU + UV disinfection + seepage pit), with an average cost of $850/year.

2.3 Affordability Analysis

An affordability analysis was performed for the cesspool conversion program. This analysis is intended to estimate the relative financial impact of cesspool upgrades on homeowners. Figure 2.3 is a schematic of the data sources, costs, and affordability measures that were used in the analysis. Each of these components are summarized in the following sections.

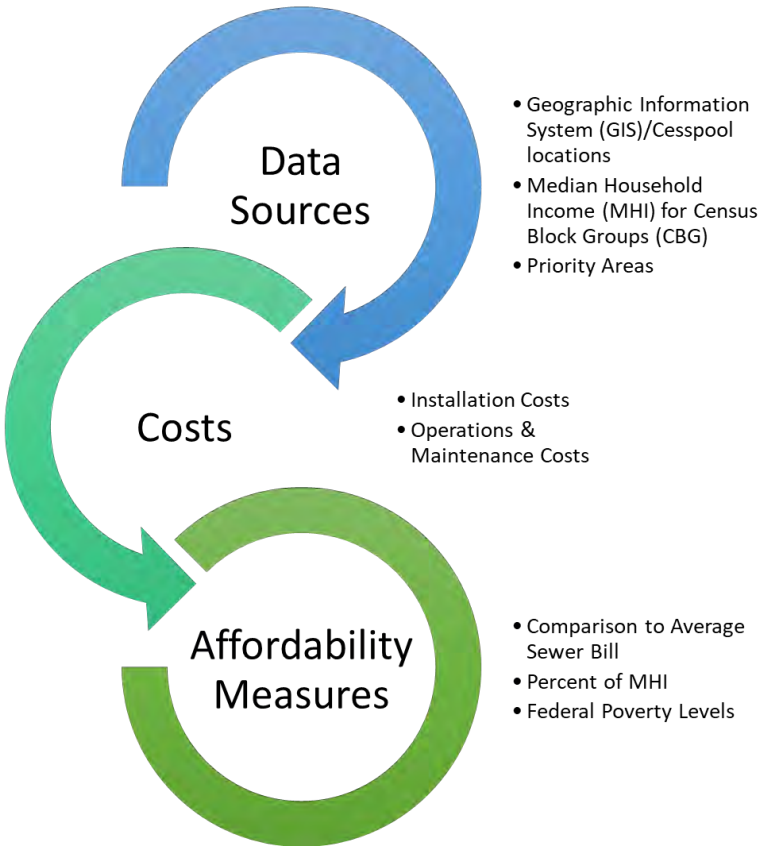

Figure 2.3 Data Sources, Costs, and Affordability Measures included in the Affordability Analysis

2.3.1 Data Sources and Collection

The primary data sources for the affordability analysis included:

- Geographic Information System (GIS) shapefiles for Hawai'i, Kaua'i, Maui, Moloka'i, and O'ahu showing individual cesspools, gathered from the Hawai'i Statewide GIS Program[4].
- GIS shapefiles for Cesspool Upgrade Priority Areas (DOH, 2018).
- MHI and number of households living in poverty for each census block group, collected from the American Community Survey (ACS) for 2018 from the U.S. Census Bureau (ACS, 2018). A census block group is the smallest geographical unit for which demographic data is available. Census block groups generally follow geographic and infrastructure boundaries such as rivers, railroads, and streets, and as a result tend to follow neighborhood boundaries. Census block groups typically cover an area with 600 to 3,000 people.[5]

2.3.2 Data Processing

The following sections describe the data processing for household demographics, and cesspool conversion prioritization and costs, monthly sewer bill comparisons, and affordability measures.

2.3.2.1 Household Demographic Data

A geospatial analysis of the Hawai'i cesspool locations was performed to assign economic and prioritization data to each cesspool site. For each household with a cesspool, a corresponding MHI and number of households living in poverty for the census block group from the ACS 2018 data was assigned. The ACS 2018 demographic data serves as a useful estimate for the income and poverty of each property owner with a cesspool in the data. Poverty data was gathered from the ACS 2018 data and assigned this to each cesspool based on its census block group.

2.3.2.2 Cesspool Conversion Prioritization

As identified in the 2018 Legislature Report, the cesspools were sorted by the priority upgrade areas. These priority upgrade areas were developed with the goal of funding a conversion program for low-income property owners. The priority upgrade categories are as follows (DOH, 2018):

- **Priority 1:** Significant risk of human health impacts, drinking water impacts, or draining to sensitive waters.
- **Priority 2:** Potential to Impact Drinking Water.
- **Priority 3:** Potential Impacts on Sensitive Waters.
- **Priority 4:** Impacts Not Identified.

If funding is limited, these priority areas represent a useful metric when allocating grants, loans, and other funding offsets to property owners. The CCWG is currently reviewing the priority areas and definitions as a part of the overall strategy development via the data validation and prioritization subgroup.

[4] http://geoportal.hawaii.gov/

[5] For more information regarding Census Block Groups, please refer to the US Census Bureau, please see https://www.census.gov/programs-surveys/geography/about/glossary.html#par_textimage_4

2.3.3 Terminology & Definitions

Throughout this TM, there are several financial terms and other definitions used to describe the analysis. Key terms and definitions are summarized as follows:

- **Affordability.** Throughout this TM, "affordability" refers to the ability for a household to pay for wastewater services without facing economic hardship. For cesspool conversion costs to be considered affordable, households would not need to consider forgoing medically necessary prescriptions or doctors' visits, sacrifice meals, face the inability to pay for childcare, energy bills, or rent/mortgage, for example (Raucher et al, 2019).
- **Financially burdened.** Those that are financially burdened would have to sacrifice essential expenses, such as those listed for affordability, to be able to pay for cesspool conversions.
- **Living wage.** A living wage is the amount of income that a household needs to pay for essential living expenses. The living wage developed by the Massachusetts Institute of Technology accounts for essential expenditures in several categories, including food, housing (including utility costs), transportation, medical care, childcare, and taxes[6].
- **Federal Poverty Level.** The FPL provides a benchmark for determining what households can be considered "impoverished" and thus qualify for assistance and support programs, but there is often a large segment of households that are above this threshold but struggle to make ends meet with their income[7].
- **Homeowner or cesspool owner.** Ultimately, it is the responsibility of the homeowner or the persons that own the property with the cesspool to meet the cesspool conversion requirements outlined in Act 125. However, some of the properties with cesspools may be rented to another resident.
- **Resident.** The resident lives at the property with the cesspool and the resident may or may not own the property. It is the resident's income level that is shown in the median household income dataset, which is a key assumption of the affordability analysis described herein. It is acknowledged that the cesspool conversion costs may or may not be passed from the homeowner to the resident (if rented).

2.3.4 Affordability Methodology

The affordability analysis included evaluation of various measures of affordability and financial impact for the cesspool conversion to answer the following questions:

- What percent of income should a typical household be expected to spend on cesspool conversion?
- How likely is it that a cesspool owner either lives below the poverty level or is significantly income-constrained?
- How does the conversion cost compare to a wastewater connection to a public system and monthly service cost for sewered areas?

Cost impacts to homeowners were previously described in Section 2.2. For installation costs, it was assumed that the conversion would be financed through a home equity loan over 20 years at 4.0 percent. There are several methodologies that have been suggested as guidance to define affordability for water and/or wastewater services. Those that have been considered herein include percent of median household income,

[6] https://livingwage.mit.edu/

[7] https://www.census.gov/topics/income-poverty/poverty.html

federal poverty and Asset Limited, Income Constrained, Employed (ALICE) levels, labor hours at minimum wage, and comparison to local sewer bills. Each is described in the following sections.

2.3.4.1 Percent of Median Household Income

Historically, affordability for water and wastewater service has been benchmarked as a percentage of MHI. The USEPA has advanced this metric in the past, stating that wastewater should be less than 2 percent of income to be considered "affordable" (USEPA, 1997). For most analysts, median household income for the municipality, zip code, or some other geographic boundary is readily available, and as a result, the percent of MHI approach has been broadly accepted as a crude measure of affordability for decades, with some going higher or lower than 2 percent. For instance, Fitch Ratings has published guidance that it generally views rates above 1 percent of MHI as "financially burdensome" for customers (Fitch Ratings, 2016).

Despite the broad use of this metric, the water and wastewater industry has sought alternatives over the last several years. Several authors have advanced new benchmarks to measure affordability in response. While percent of MHI is now a useful starting point, the same water and wastewater bill will have a much greater relative impact on a low-income household than a median income household. Affordability measures should therefore reflect this relative impact.

Much of MHI's shortcomings as an affordability measure stem from the fact that it is often used to cover too broad of a geographic area. The MHI for an entire state or even a county or zip code encompasses an extremely broad range of income levels and is likely to be representative of a relatively small subset of households.

In contrast, the MHI for a census block group is likely to more closely reflect the income levels of most residents because the block group tends to follow neighborhood boundaries and is likely to include less socioeconomic stratification. While the MHI for the entire state of Hawai'i represents the income distribution across approximately 1.4 million people, the MHI for a block group represents at most 6,000 people. Therefore, the percent of MHI for each block group was used for this analysis. It was assumed that the median household income for the block group is approximately representative of the individual cesspool owners.

There are still challenges and shortcomings to this approach. First, the census block group MHI does not differentiate between renters and homeowners, which may provide further levels of income stratification. Renters may report income that is then reflected in the census data but ultimately, they may not be directly paying for the cesspool conversion.

Second, even when using the median income of a small block group, there still may be substantial income stratification within the group. It is unlikely that this group will be perfectly homogeneous from a socioeconomic perspective. As a result, the MHI analysis focuses on a typical household, and does not reflect the lower end of the income distribution where affordability challenges are greatest.

The threshold where the average cesspool conversion and O&M costs are less than 2 percent of MHI is $126,125 per year for the average cost scenario ($210 per month).

2.3.4.2 Federal Poverty and ALICE Levels

Affordability challenges naturally begin at the lower end of the income distribution. Households with incomes below a "living wage" face the greatest difficulty paying for basic services like water and wastewater. A living wage is the amount of income that a household needs to pay for essential living expenses. The living wage developed by the Massachusetts Institute of Technology accounts for essential expenditures in several categories, including food, housing (including utility costs), transportation, medical

care, childcare, and taxes. Several different measures were reviewed in this analysis to observe the baseline level of poverty. While these measures do not measure the affordability of the cesspool conversion costs (they do provide a benchmark for affordability), they do highlight where income constrained census block groups overlap with cesspool locations.

The census block group data includes an estimate of the number of households living in poverty. For 2018, the U.S. Census Bureau defined poverty level as a family with an income of less than $30,718.[8] The FPL provides a benchmark for determining what households can be considered "impoverished" and thus qualify for assistance and support programs, but there is often a large segment of households that are above this threshold but struggle to make ends meet with their income. In fact, the FPL is so low for most states, that many references to the FPL are in terms of multiples of FPL, e.g. 200 percent of FPL or 400 percent of FLP. "The FPL, with its minimal and uniform national estimate of the cost of living, far underestimates the number of households that cannot afford to live and work in the modern economy." (ALICE Report, 2020)

ALICE is one measure used to define households who may not qualify for aid under FPL measures but still have significant challenges making ends meet. ALICE household budgets are intended to provide a more realistic estimate of how much income is necessary to both live and work in each geography. This economic indicator has been in existence for about a decade. The 2018 ALICE household survival budget for a family of four in Hawai'i is estimated at $90,828 per year (United for ALICE, 2020). This compares to the FPL for a family of four estimated at $28,870 in 2018. There have been 3 reports published based on 2016, 2017 and 2018 data. It typically takes about 2 years to analyze the data. Therefore, the current 2020 ALICE report is based on 2018 data.

While ALICE indicators are prepared for each state through census data, approximately 20 states[9] actively support additional economic research in their respective states to further understand the drivers of economic challenges in their communities. This research is led by a 27-person national advisory committee that represents the various states, including Hawai'i and is tasked with making sure that the data and research are applied independently and consistently towards the development of ALICE models and tools.

The ALICE budget is comprised of the following categories: housing, childcare, food, transportation, health care, technology, taxes, savings, and miscellaneous (10 percent of budget).

The main conclusions of the most recent ALICE report for Hawai'i indicate a troubling trend. Despite strong economic growth until Coronavirus Disease 2019 (COVID-19) impacts hit the state in March 2020, the number of ALICE households rose from 22 percent in 2007 to 33 percent in 2018. The total number of households in Hawaii is estimated at 455,100. This trend is exacerbated by the recent COVID-19 impacts with the ALICE report estimating that an additional 35,000 households would become ALICE households by the end of 2020.

2.3.4.3 Hours of Labor at Minimum Wage

Some water utility affordability scholars have argued in support of using hours of labor at minimum wage as a measure of affordability (Teodoro, 2018). This metric puts the water and sewer bill in terms of how many hours a person would have to work at the local minimum wage in order to pay for sewer service. The minimum wage across the state is $10.10 per hour[10].

[8] For more information regarding the U.S. Census Bureau's poverty measures, please see https://www.census.gov/topics/income-poverty/poverty/guidance/poverty-measures.html
[9] AK, CT, FL, HI, ID, IL, IN, IO, LA, MA, MI, NJ, NY, OH, OR, PA, TN, TX, VA, WA and WI
[10] Effective January 1, 2018. See https://labor.hawaii.gov/wsd/minimum-wage/

2.3.4.4 Comparison to Centralized Wastewater Collection and Treatment

Many communities across the United States are served by centralized wastewater collection and treatment systems. While these are less prevalent in Hawai'i compared to other states, there are wastewater treatment plants (WWTP) across the state that can offer a comparative monthly cost for residential households. While comparing cesspool conversion costs with WWTP service charges does not measure affordability (as the monthly sewer bills may exceed 2 percent of income for some customers), it does provide a local benchmark for alternative cost.

Figure 2.4 shows typical average monthly sewer service charges for wastewater collection and treatment for the various counties compared to the monthly cost for cesspool conversion for the low, average, and high cost scenarios.

Hawai'i County has the lowest monthly wastewater bill at $40 per month on average, while City and County of Honolulu has the highest at $111 per month. As a percent of MHI for each county, the monthly wastewater bills range from 0.8 percent (Hawai'i County) to 1.6 percent (City and County of Honolulu).

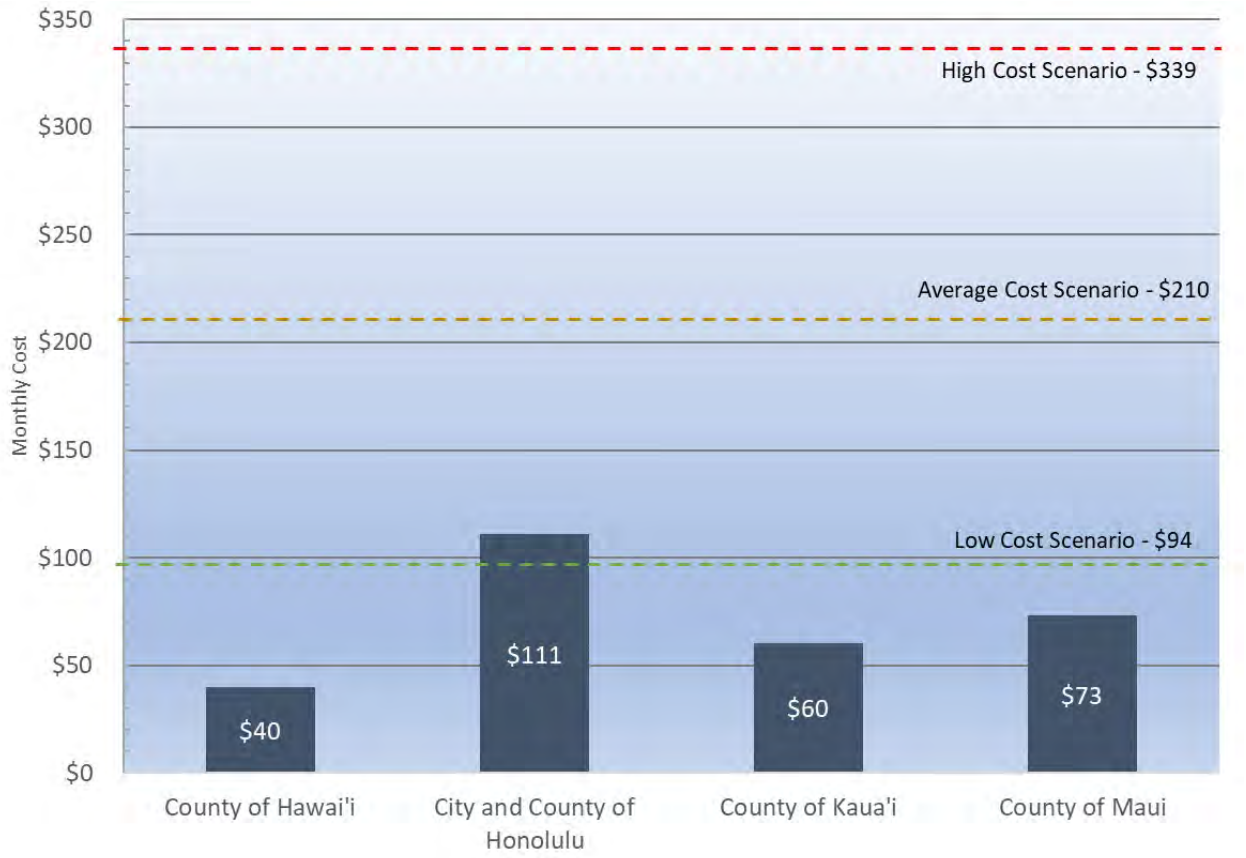

Figure 2.4 Typical Monthly Sewer Bill Compared to Monthly Cesspool Conversion Costs for Average Scenario[1-4]

Notes:
(1) County of Hawai'i – single family monthly flat rate of $40.00
(2) City and County of Honolulu – based on estimated single family water usage at 9,000 gals/month. Wastewater bill is 80 percent of water usage*$4.63/kgals + base fee of $77.55 = $110.89
(3) County of Kaua'i – single family monthly flat rate of $60.09
(4) County of Maui – based on estimated single family water usage at 9,000 gals/month. Wastewater bill is based on all water usage up to 9,000 gals at $4.50/kgals + base fee of $32.50 = $73.00

2.4 Affordability Analysis Results and Discussion

To streamline the affordability analysis, this effort focused on the cesspool conversion costs relative to the percent of median household income levels by census block groups and federal poverty levels statewide and for each of the counties individually. Because the minimum wage is uniform across the state, this measure was not included with the county-level results. Affordability analyses using the ALICE household budget level are included in Appendix B for reference. Appendix C summarizes the affordability analyses by county and legislative district.

2.4.1 Statewide

The following sections summarize the affordability analysis for the state of Hawai'i, considering the percent of census block group median household income and federal poverty levels.

2.4.1.1 Census Block Group Median Household Income

Figure 2.5 shows the number of cesspools statewide by census block group MHI. The dashed black lines indicate the affordability threshold previously defined as 2 percent of MHI ($126,125 per year for the average cost scenario or $210 per month and $89,766 per year for the adjusted average cost scenario [after rebate] or $150 per month for cesspool conversion costs). The number of cesspools and MHI levels to the left of the dashed line are projected to have affordability challenges with the cesspool upgrades. By this definition, approximately 82,424, or 97 percent of all cesspool owners in the state will be financially burdened by cesspool upgrade costs without financial assistance. The FPL is shown for reference.

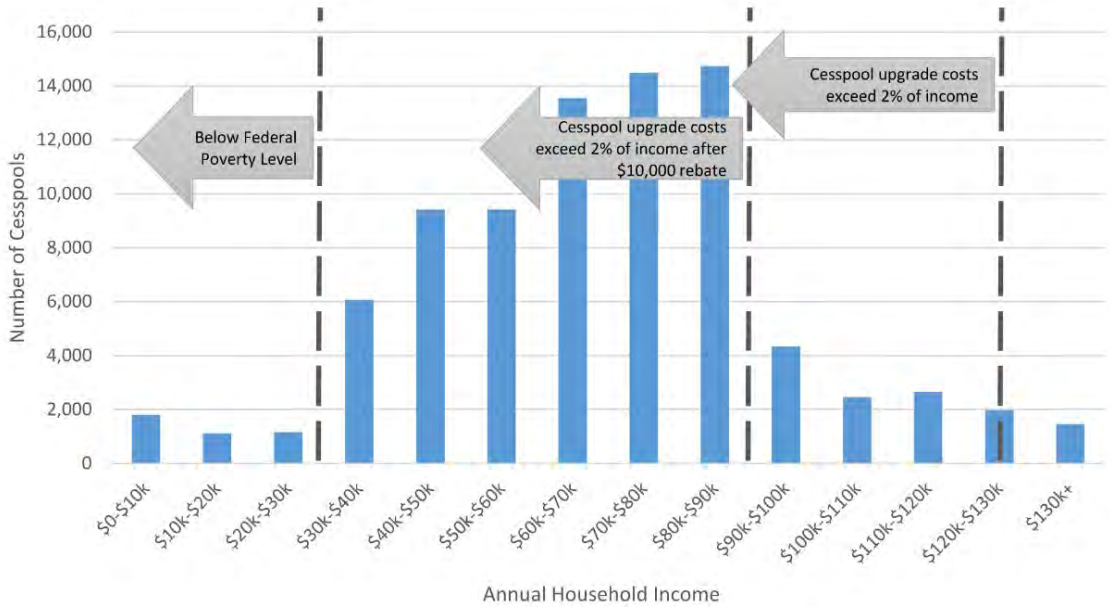

Figure 2.5 Statewide Number of Cesspool Homeowners Relative to Median Household Income Levels(1)

Notes:
(1) Assumes average cesspool conversion cost scenario of $210 per month.

Figure 2.6 shows the same information broken down by county relative to MHI levels and the affordability threshold. Assuming no financial assistance, an estimated 48,303 cesspools owners with affordability challenges are in Hawai'i County. The County of Maui has approximately 13,327 cesspool owners below the affordability threshold, followed by the County of Kaua'i with approximately 11,507 homeowners impacted. Lastly, the City and County of Honolulu has the least number of homeowners impacted with approximately 9,287.

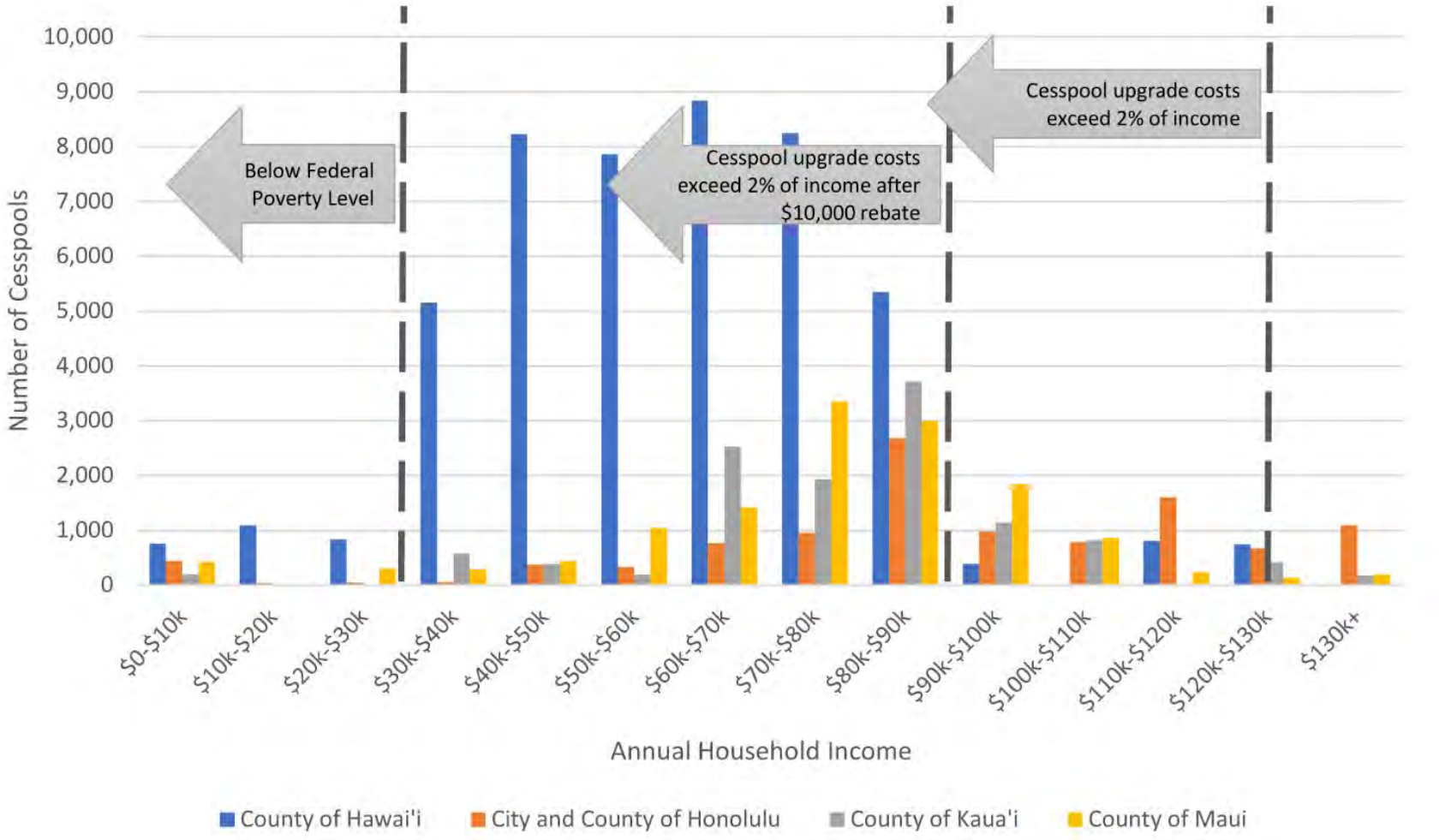

Figure 2.6 Number of Cesspool Homeowners Relative to Median Household Income Levels by County

Notes:
(1) Assumes average cesspool conversion cost scenario of $210 per month.

Table 2.3 shows the results of the affordability analysis considering census block group MHI by cesspool priority level. Assuming no financial assistance, the cost of cesspool conversions would exceed 2 percent of MHI for 97 percent of cesspool owners (all priority categories). It is estimated that 99 percent of the Priority 1 cesspool owners will have difficulty affording cesspool conversions. If the high cesspool conversion cost scenario is assumed (estimated cost of $339 per month), virtually all cesspool homeowners would be financially burdened by the conversion.

These results show that cesspool conversion costs would be a significant burden for most Hawai'i residents. Given that a vast majority of the cesspool homeowners are likely to find the conversion unaffordable even when costs are financed over 20 years, significant affordability challenges should be expected for the program, absent additional funding.

Table 2.3 Statewide – Number of Households Expected to Exceed 2 Percent of Income

Priority Categories	Number of Cesspools(1)	Number of Households Projected to Spend >2 percent of Income on Cesspool Conversion(2)		
		Low Cost	Average Cost	High Cost
1	8,532	341	8,434	8,532
2	14,500	5,048	14,321	14,500
3	18,306	3,121	17,717	18,306
4	43,379	16,759	41,952	43,358
Totals	**84,717**	**25,269**	**82,424**	**84,696**

Notes:
(1) Number of cesspools are based on GIS data and may not align exactly with the 2018 DOH report.
(2) Based on the median household income for the census block group where the cesspool site resides.

2.4.1.2 Poverty Levels

Across the state, it is estimated that 4.8 percent or 4,104 households with cesspools have incomes below the federal poverty level or $30,718.

Figure 2.7 shows the percent of cesspool homeowners by county and statewide that fall in various categories relative to the FPL ($30,718), including:

- Below FPL.
- Between 100-200 percent of FPL ($30,718-$61,436).
- Between 200-300 percent of FPL ($61,436-$92,154).
- Between 300-400 percent of FPL ($92,154-$122,872).
- Above 400 percent of FPL (>$122,872).

The County of Hawai'i has the most residents with cesspools located in block groups where the MHI is both below the FPL and between 100 and 200 percent of FPL, with 1,867 and 15,640 cesspools, respectively. The City and County of Honolulu, County of Maui, and County of Kaua'i follow, with 489, 460, and 204 cesspools located in block groups where the MHI is below the FPL, respectively.

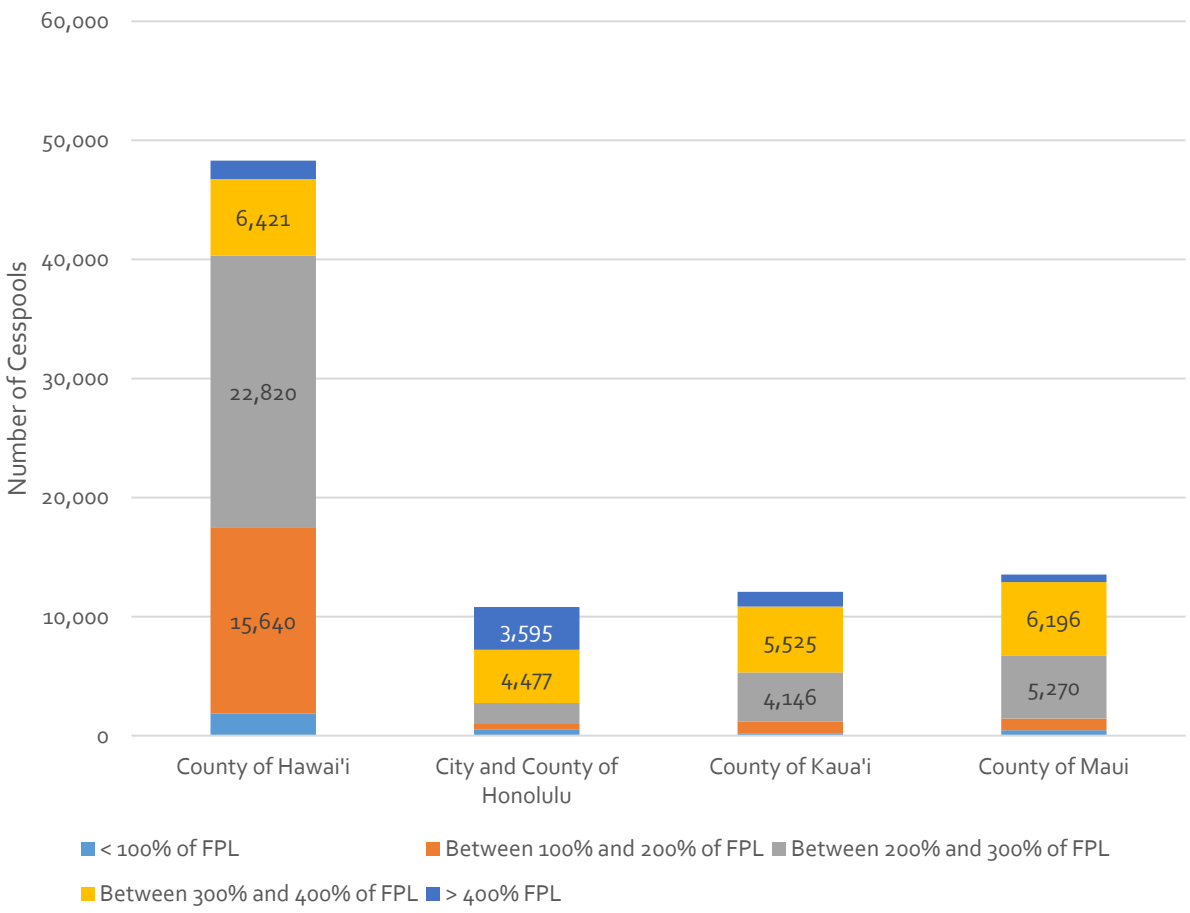

Figure 2.7 Number of Cesspool Homeowners by Federal Poverty Levels

2.4.2 County of Hawai'i

The following sections summarize the affordability analysis for the County of Hawai'i by percent of census block group MHI, and poverty levels. The County of Hawai'i has the largest number of cesspools (48,303), as well as the most residents facing affordability challenges. Hawai'i County also has the greatest proportion of households without centralized sewers than any other county (71 percent). This high percentage indicates that sewer mains are unlikely to be available for most properties. Without options to connect to existing centralized wastewater systems, the only option for many cesspool owners in Hawaii County is approved OSWT systems.

2.4.2.1 Census Block Group Median Household Income

Figure 2.8 shows the number of cesspools in the County of Hawai'i by census block group MHI. The dashed black lines indicate the affordability threshold previously defined as 2 percent of MHI (for full cost and adjusted cost after $10,000 rebate). As previously discussed, the County of Hawaii has the most significant cesspool conversion affordability challenges based on MHI data. Approximately 48,303 cesspools owners located in Hawai'i County (more than half of all cesspools in the state) are expected to face affordability challenges for conversions.

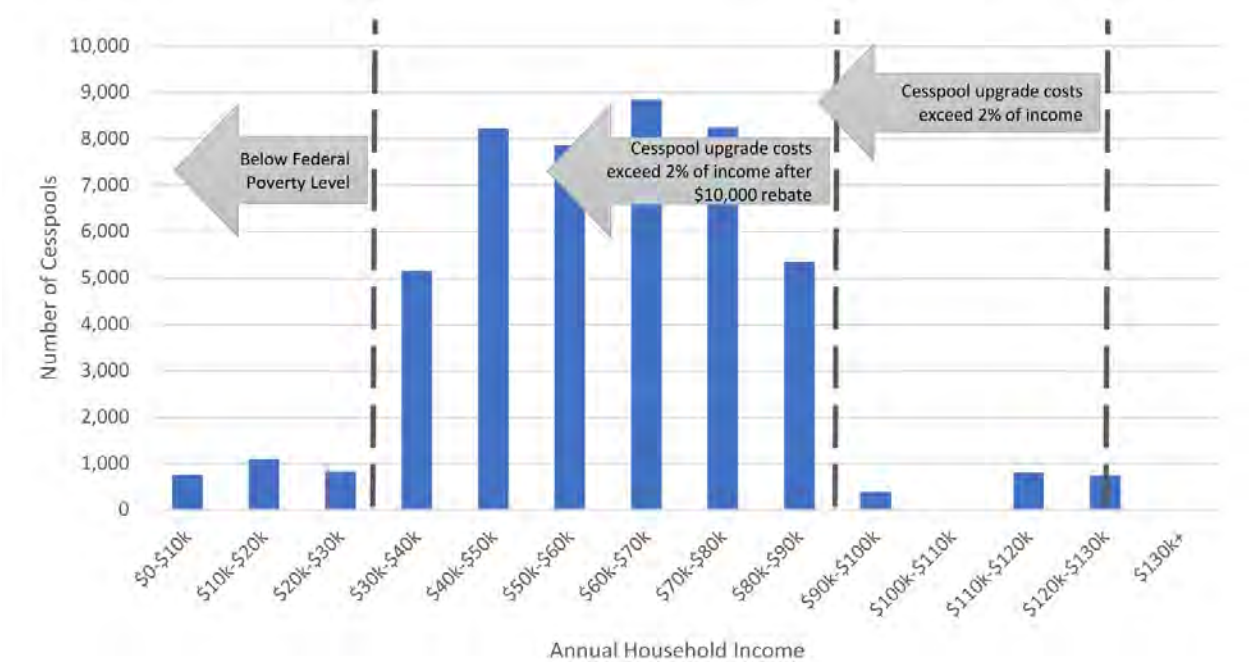

Figure 2.8 Hawai'i County – Number of Cesspools Relative to Median Household Income(1)

Notes:
(1) Assumes average cesspool conversion cost scenario of $210 per month.

Figure 2.9 shows the locations of the Hawai'i County's cesspools relative to median household incomes and priority upgrade areas. The Priority 2 area south of the Hilo Bay area shows that homeowners have MHI levels below the affordability threshold. Most homeowners in this area appear to have MHIs of less than $80,000 and MHI appears to decrease moving inland. The Priority 2 area near Hilo Bay shows a mixture of MHI with pockets of lower income levels ranging from $0 to $40,000. Other Priority 3 areas located on the Kona side and near Puako show MHIs ranging from $50,000 to $80,000, which is still below the affordability thresholds for cesspool conversions. MHI data for cesspools located outside of priority upgrade areas range widely. The highest MHIs are shown in the Waimea area. Lower MHI data are shown for more sparsely populated, coastal and inland areas.

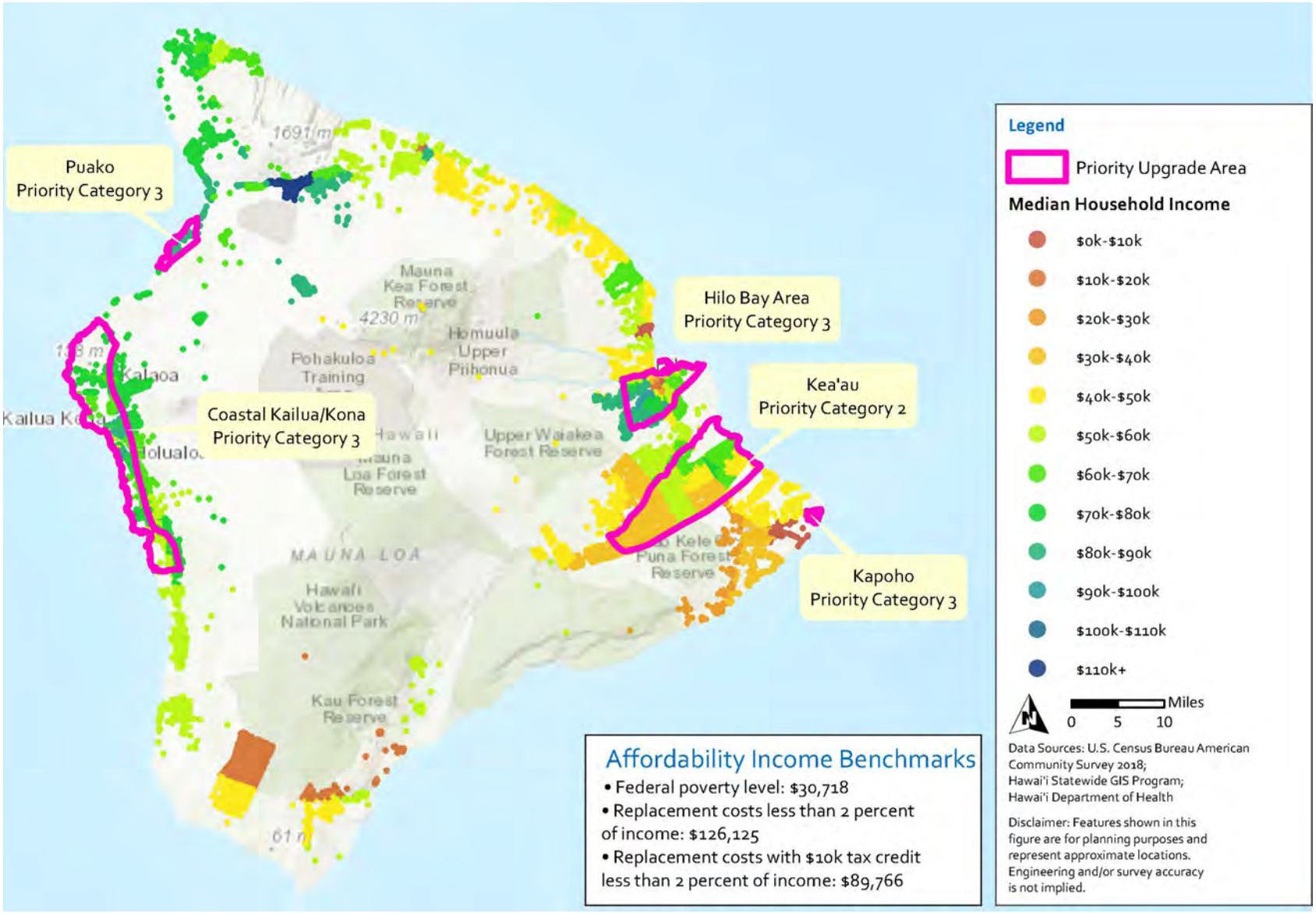

Figure 2.9 Hawai'i County Cesspools and Median Household Income Levels

Table 2.4 summarizes the number of cesspool owners expected to spend greater than 2 percent of their income on conversion broken down by low, average, and high conversion cost scenarios and by priority level. All County of Hawai'i cesspool homeowners fall below the affordability threshold for the average conversion cost scenario. Approximately 44 percent of cesspool homeowners would be unable to afford cesspool conversions under the low-cost scenario. A greater share of the County of Hawai'i's residents would face affordability issues for cesspool conversion compared with statewide metrics.

Table 2.4 Hawai'i County – Number of Households Projected to Exceed 2 Percent of Income

Priority Categories	Number of Cesspools	Number of Households Projected to Spend >2 percent of Income on Cesspool Conversion(1)		
		Low Cost	Average Cost	High Cost
1	0	NA	NA	NA
2	8,039	4,651	8,039	8,039
3	15,188	2,784	15,188	15,188
4	25,076	13,841	25,076	25,076
Totals	**48,303**	**21,376**	**48,303**	**48,303**

Notes:
(1) Based on the median household income for the census block group where the cesspool site resides. Assumes no financial assistance.
(2) NA = not applicable

2.4.2.2 Poverty

Like the state as a whole, the majority of the County of Hawai'i's cesspool homeowners have incomes above the FPL. Approximately 5.5 percent or 2,675 households with cesspools have incomes below the FPL.

2.4.3 City and County of Honolulu

The following sections summarize the affordability analysis for the City and County of Honolulu by percent of census block group MHI, and poverty levels. Most homeowners have sewer connections such that the City and County of Honolulu has the lowest percentage of households with a cesspool at 3 percent. There are an estimated 311,525 households and 10,805 cesspools in the City and County of Honolulu.

2.4.3.1 Census Block Group Median Household Income

Figure 2.10 shows the number of cesspools in the City and County of Honolulu by census block group MHI. The dashed black lines indicate the affordability threshold previously defined as 2 percent of MHI (for full cost and adjusted cost after rebate).

Honolulu's census block group MHI distribution is skewed more to the right than the other counties, but it also has a significant number of block groups at the far-left end of the distribution, with incomes below $10,000 per year. Therefore, while the county may not have the same broad affordability challenges that other counties will see, the households that will be unable to pay for conversion may be extremely challenged to do so.

Figure 2.11 shows the locations of the City and County of Honolulu's cesspools relative to median household incomes and priority upgrade areas. The Priority 1 area in Kahulu'u shows MHIs ranging from $90,000-$110,000+ (on the border and above the affordability threshold). The Priority 3 area on the Windward side of the island near Waimanalo shows most MHIs ranging from $50,000-$100,000. Some homeowners in this area will require financial assistance with cesspool upgrades. The Diamond Head area of O'ahu is a Priority 3 area with MHIs ranging widely from $0-$110,000+. Connection to the City and County of Honolulu's sewer

system may be an option for these homeowners; however, sewer construction in this area may be challenging. Without a sewer connection, some homeowners may require financial assistance for upgrades.

The Priority 3 area in Ewa Beach shows higher MHIs ranging from $90,000-$110,000+. Many of these homeowners may be able to afford cesspool conversions without significant financial assistance. However, homeowners in the Priority 3 area near Waialua have MHIs ranging from $40,000-$80,000 (less than the affordability threshold) and may require financial assistance. There are some pockets of MHIs showing as greater than $110,000 in this area where homeowners may be able to afford the cesspool upgrades.

Table 2.5 summarizes the number of cesspools projected to spend more than 2 percent of income on the cesspool conversion in the City and County of Honolulu for the low, average, and high cost scenarios and by priority level. It is estimated that approximately 86 percent of City and County of Honolulu cesspool homeowners (9,287) fall below the affordability threshold for the average conversion cost scenario.

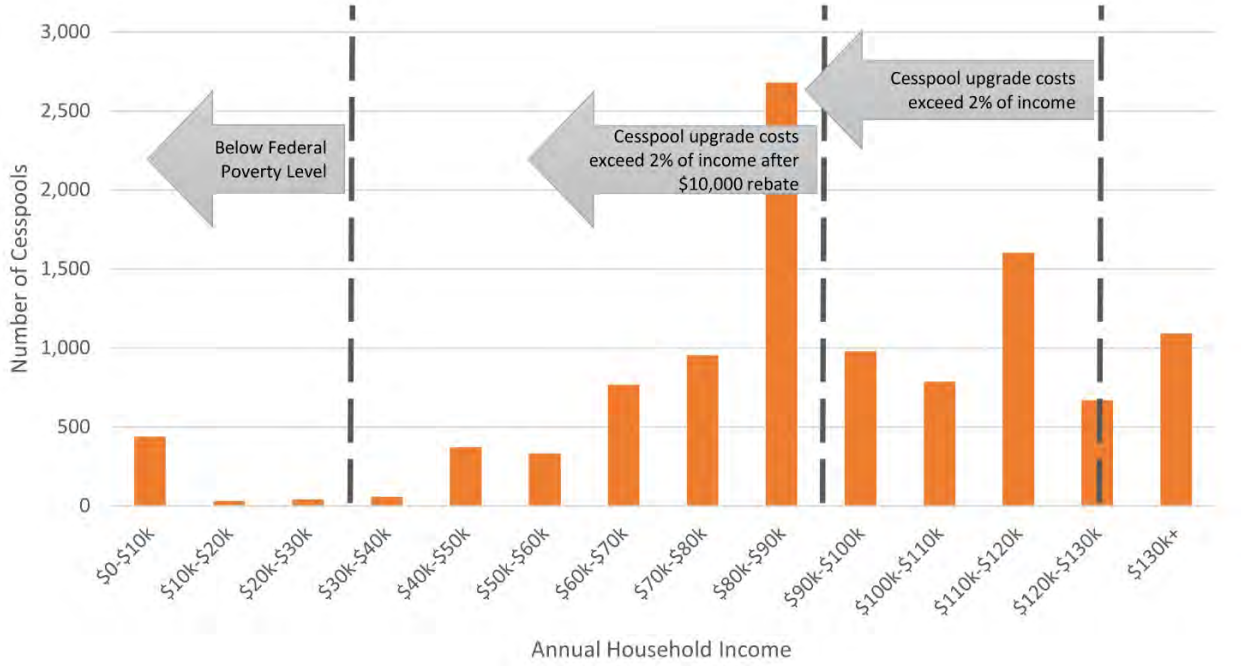

Figure 2.10 City and County of Honolulu – Number of Cesspools Relative to Median Household Income Levels(1)

Notes:
(1) Assumes average cesspool conversion cost scenario of $210 per month.

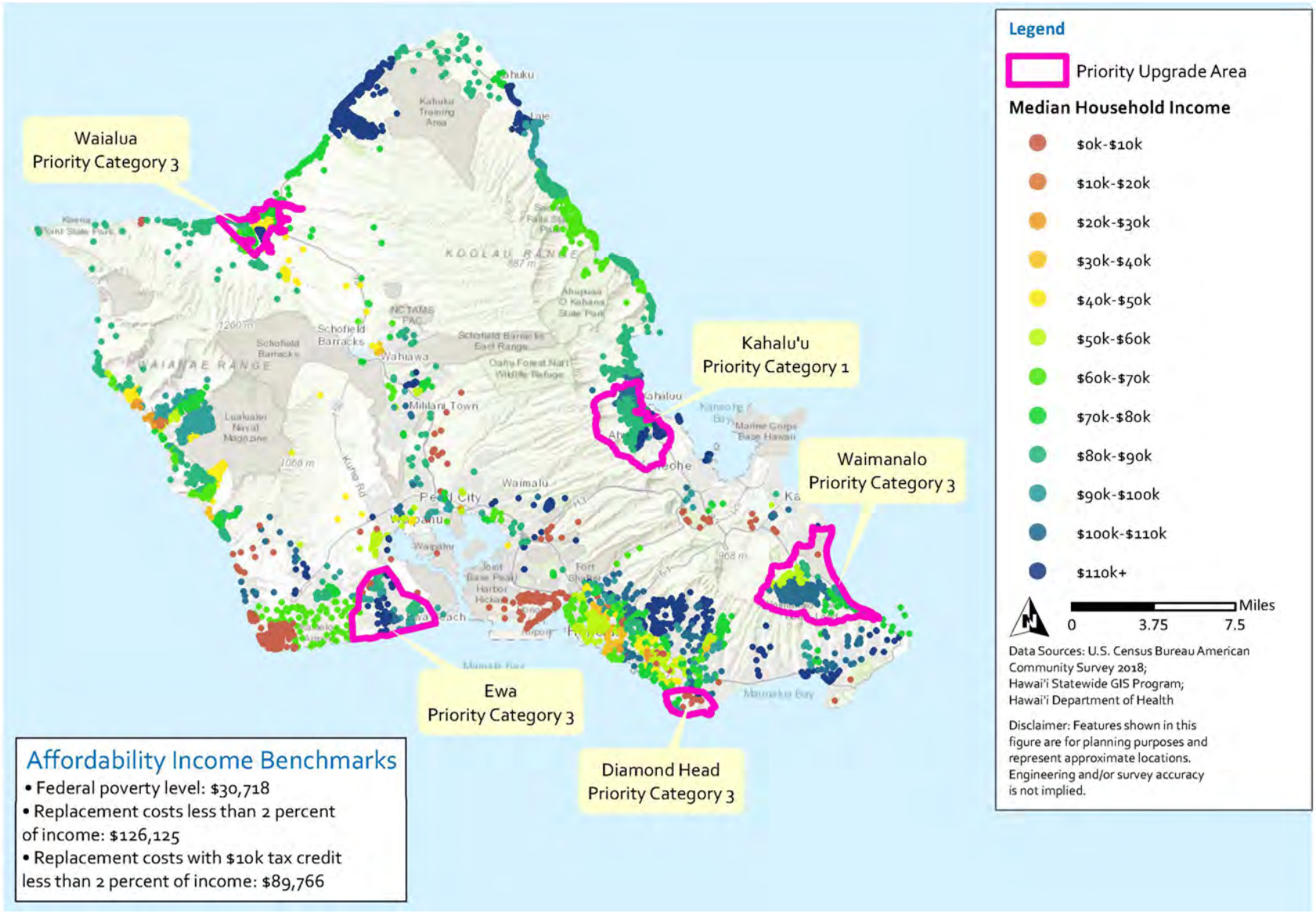

Figure 2.11 City and County of Honolulu Cesspools and Median Household Income

Table 2.5 City and County of Honolulu – Percent of Median Household Income by Priority Category

Priority Categories	Number of Cesspools	Number of Households Projected to Spend >2 percent of Income on Cesspool Conversion(1)		
		Low Cost	Average Cost	High Cost
1	656	NA	656	656
2	0	NA	NA	NA
3	2,924	147	2,335	2,924
4	7,225	1,027	6,296	7,204
Totals	**10,805**	**1,174**	**9,287**	**10,784**

Notes:
(1) Based on the median household income for the census block group where the cesspool site resides. Assumes no financial assistance.
(2) NA = not applicable

2.4.3.2 Poverty Levels

The City and County of Honolulu has approximately 4.7 percent or 512 households with cesspools that have incomes below the FPL.

2.4.4 County of Kauaʻi

The following sections summarize the affordability analysis for the County of Kauaʻi by percent of census block group MHI, and poverty levels. There are an estimated 12,085 cesspools and 22,524 households in Kauaʻi County, with approximately 54 percent of households having a cesspool.

2.4.4.1 Census Block Group Median Household Income

Figure 2.12 shows the number of cesspools in the County of Kauaʻi by census block group MHI. The dashed black lines indicate the affordability threshold previously defined as 2 percent of MHI (for full cost and adjusted cost after rebate). Approximately 11,507 cesspools owners located in Kauaʻi County, or 95 percent, are expected to face affordability challenges for cesspool conversions without financial assistance.

Figure 2.13 shows the locations of Kauaʻi County's cesspools relative to median household incomes and priority upgrade areas. The Priority 3 area near Hanalei Bay area shows that homeowners have MHI levels ranging from $20,000 to $70,000, which is below the affordability threshold. The Priority 2 level area near Kapaʻa/Wailua shows MHIs ranging from $40,000 to $100,000, just below the affordability threshold. Also, Priority 2 level area on the south side of Kauaʻi shows a range of $40,000 to more than $110,000 for MHIs.

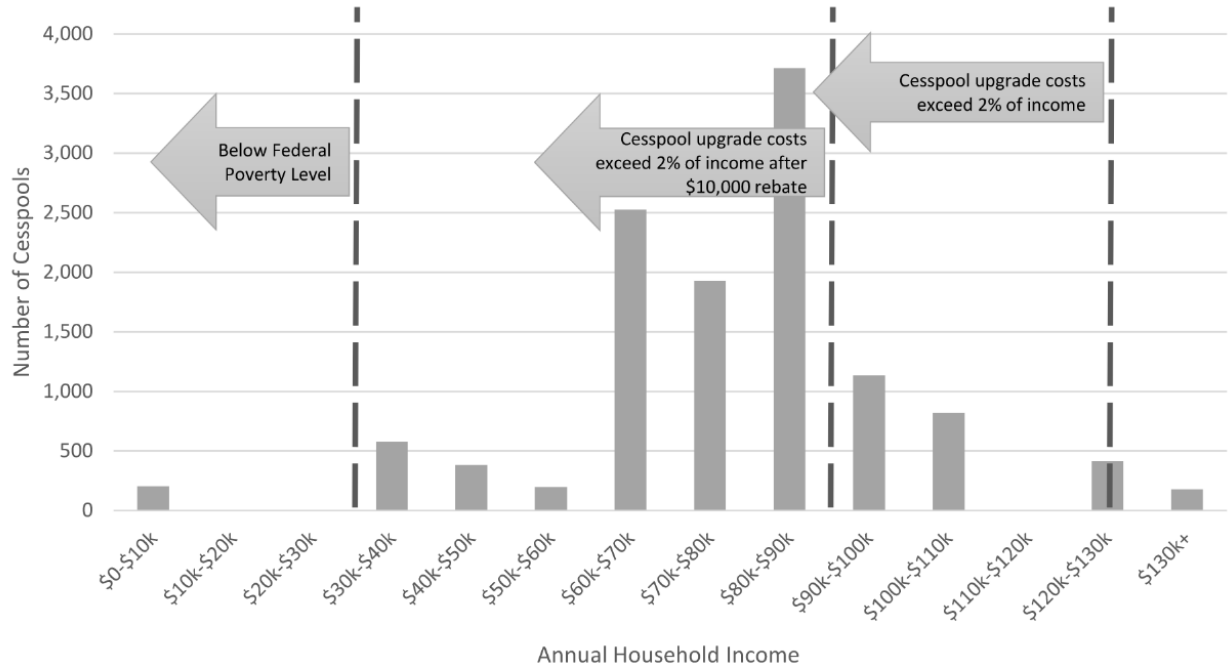

Figure 2.12 County of Kaua'i – Number of Cesspools Relative to Median Household Income Levels(1)

Notes:
(1) Assumes average cesspool conversion cost scenario of $210 per month.

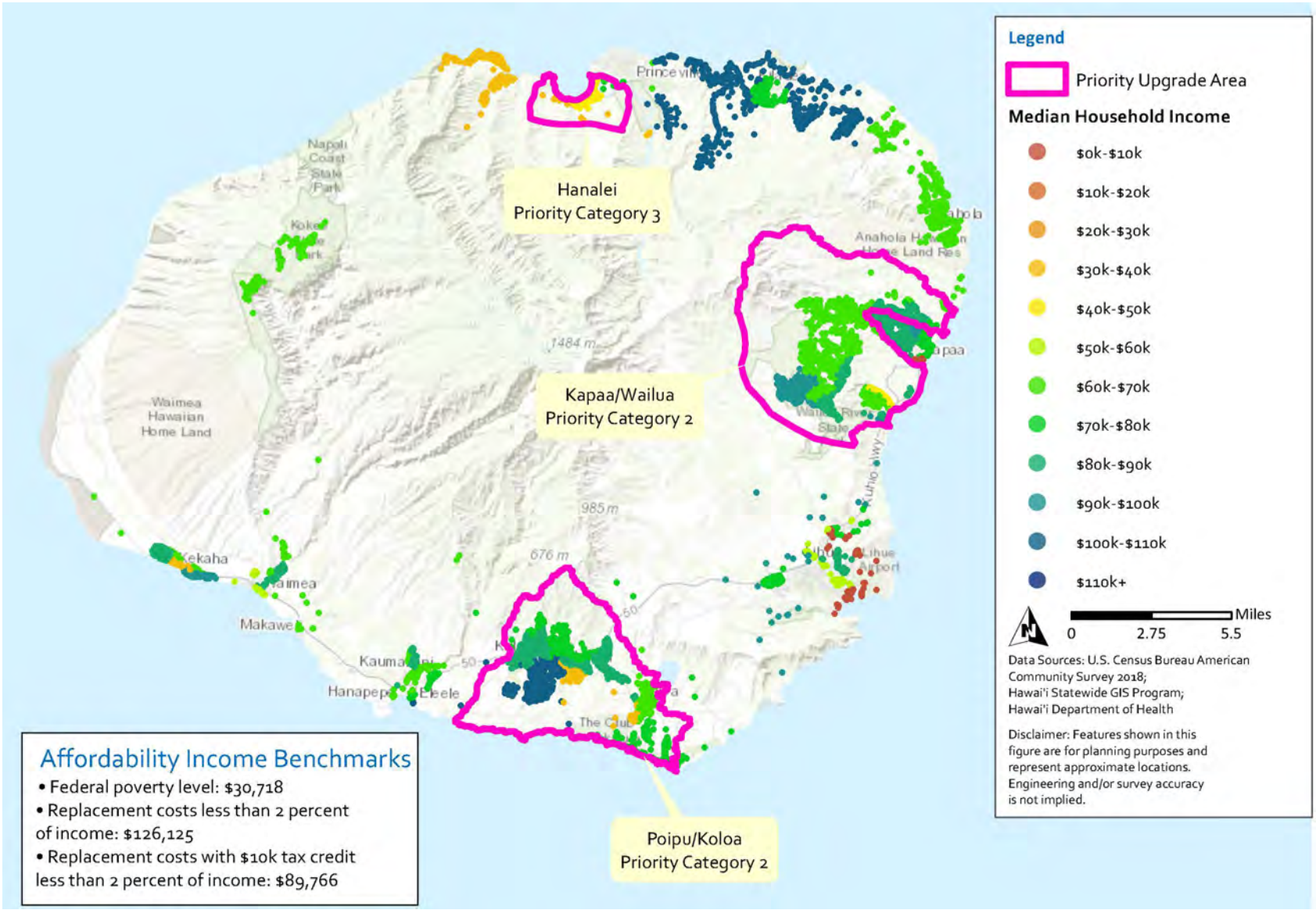

Figure 2.13 Kaua'i County Cesspools and Median Household Income

Table 2.6 summarizes the number of cesspools projected to spend more than 2 percent of income on the conversion in the County of Kauaʻi for the low, average, and high cost scenarios and by priority level. It is estimated that effectively 84 percent (11,507) of County of Kauaʻi cesspool homeowners fall below the affordability threshold for the average conversion cost scenario.

If the high cost scenario is assumed, all cesspool homeowners on Kauaʻi fall below the affordability threshold, while only 8 percent would fall under the same designation under the low-cost scenario. Compared with the statewide metrics, a slightly smaller share of Kauaʻi County cesspool homeowners is expected to face affordability issues for cesspool conversion.

Table 2.6 County of Kauaʻi – Number of Households Projected to Exceed 2 Percent of Income

Priority Categories	Number of Cesspools	Number of Households Projected to Spend >2 percent of Income on Cesspool Conversion(2)		
		Low Cost	Average Cost	High Cost
1	0	NA	NA	NA
2	6,461	397	6,282	6,461
3	194	190	194	194
4	5,430	605	5,031	5,430
Totals	**12,085**	**1,192**	**11,507**	**12,085**

Notes:
(1) Based on the median household income for the census block group where the cesspool site resides. Assumes no financial assistance.
(2) NA = not applicable

2.4.4.2 Poverty Levels

The County of Kauaʻi has the smallest share of households assumed to be living below the FPL across all counties in Hawai'i at 1.7 percent or 512 of residents with cesspools.

2.4.5 County of Maui

The County of Maui includes Maui, Molokaʻi, Lānaʻi, and Kahoʻolawe, of which Maui and Molokaʻi have cesspools included in this analysis. This section is divided between these two islands. There are an estimated 12,085 cesspools in Maui County, compared with 54,274 households. It is estimated that approximately 22 percent of households have a cesspool.

2.4.5.1 Maui

The following sections summarize the affordability analysis for Maui by percent of census block group MHI, and poverty levels.

Census Block Group Median Household Income

Figure 2.14 shows the number of cesspools in Maui by census block group MHI. The dashed black lines indicate the affordability threshold previously defined as 2 percent of MHI (for full cost and adjusted cost after $10,000 rebate).

Table 2.7 summarizes the number of cesspools projected to spend more than 2 percent of income on the cesspool conversions in Maui for the low, average, and high cost scenarios by priority level. It is estimated that approximately 98 percent of Maui cesspool homeowners (11,888) fall below the affordability threshold for the average conversion cost scenario without financial assistance.

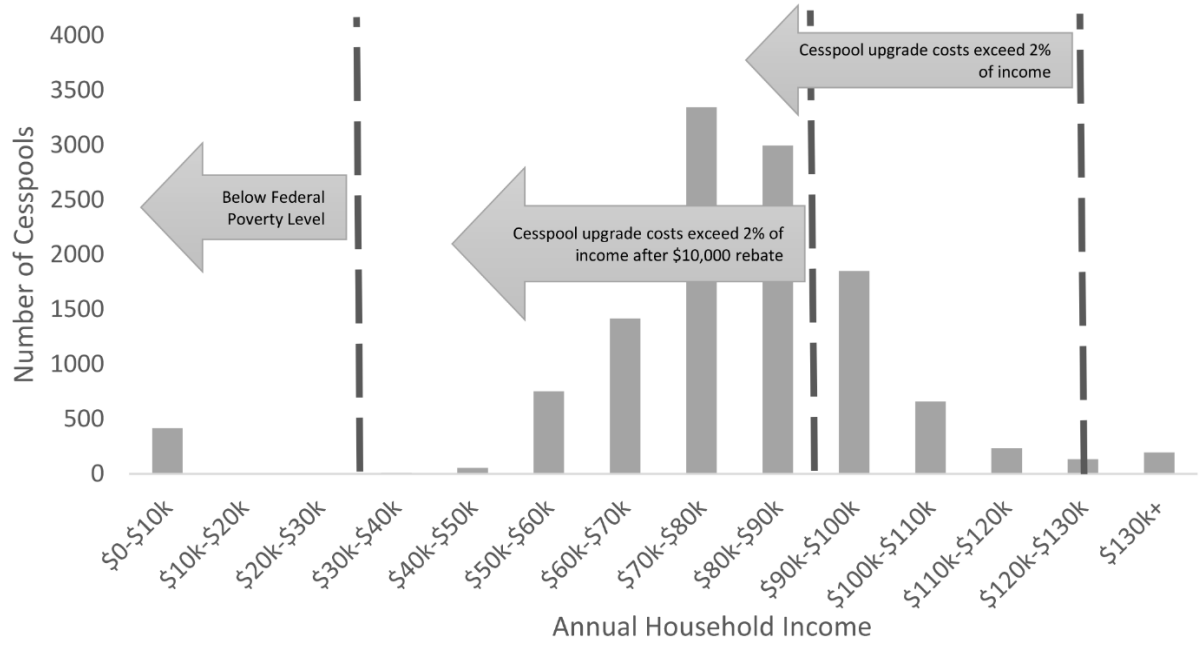

Figure 2.14 Maui – Number of Cesspools Relative to Median Household Income Levels(1)

Notes:
(1) Assumes average cesspool conversion cost scenario of $210 per month.

Table 2.7 Maui – Number of Households Projected to Exceed 2 Percent of Income

Priority Categories	Number of Cesspools	Number of Households Projected to Spend >2 percent of Income on Cesspool Conversion(1)		
		Low Cost	Average Cost	High Cost
1	7,876	341	7,778	7,876
2	0	NA	NA	NA
3	0	NA	NA	NA
4	4,209	231	4,110	4,209
Total	**12,085**	**572**	**11,888**	**12,085**

Notes:
(1) Based on the median household income for the census block group where the cesspool site resides. Assumes no financial assistance.
(2) NA = not applicable

Poverty Levels

It is estimated that 3.4 percent or 416 households with cesspools on Maui have incomes below the FPL.

2.4.5.2 Molokaʻi

The following sections summarize the affordability analysis for Molokaʻi by percent of census block group MHI, and poverty levels.

Census Block Group Median Household Income

Figure 2.15 shows the number of cesspools in Molokaʻi by census block group MHI. The dashed black lines indicate the affordability threshold previously defined as 2 percent of MHI (for full cost and adjusted cost after rebate).

Table 2.8 summarizes the number of cesspools projected to spend more than 2 percent of income on the cesspool conversions in Maui for the low, average, and high cost scenarios and by priority level. It is estimated that effectively all Molokaʻi cesspool homeowners (1,439) fall below the affordability threshold for the average conversion cost scenario.

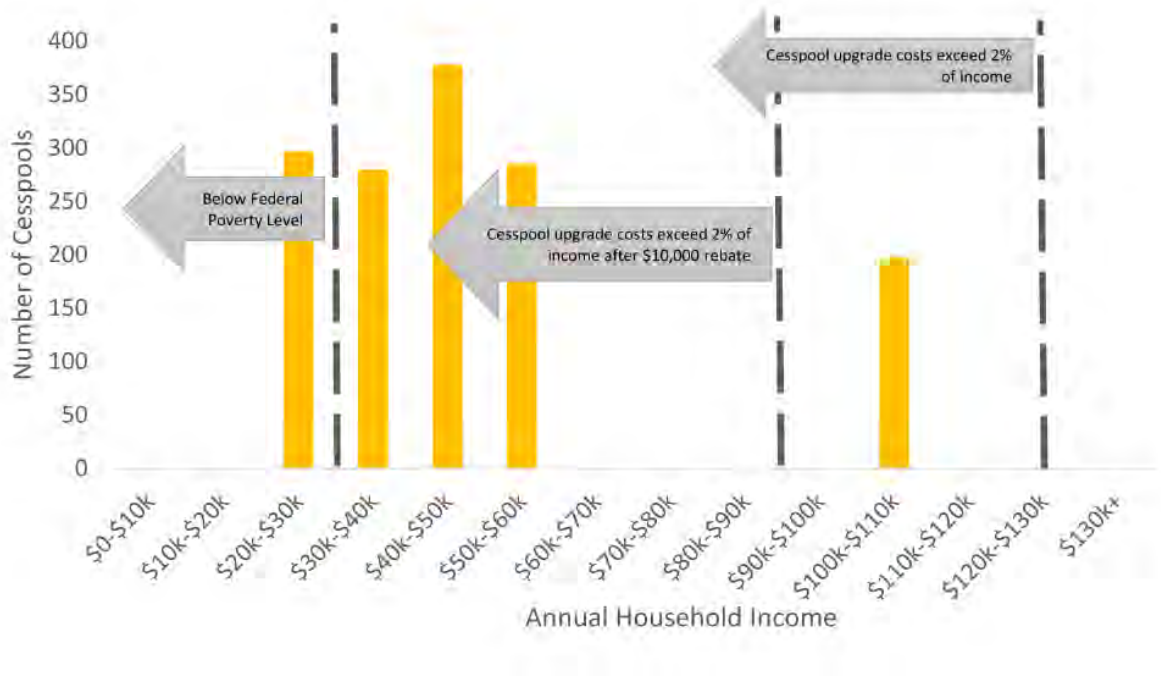

Figure 2.15 Moloka'i - Number of Cesspools Relative to Median Household Income Levels (1)

Notes:
(1) Assumes average cesspool conversion cost scenario of $210 per month.

Table 2.8 Molokaʻi – Number of Cesspools Projected to Exceed 2 Percent of Income

Priority Categories	Number of Cesspools	Number of Households Projected to Spend >2 percent of Income on Cesspool Conversion(1)		
		Low Cost	Average Cost	High Cost
1	0	NA	NA	NA
2	0	NA	NA	NA
3	0	NA	NA	NA
4	1,439	955	1,439	1,439
Totals	**1,439**	**955**	**1,439**	**1,439**

Notes:
(1) Based on the median household income for the census block group where the cesspool site resides. Assumes no financial assistance.
(2) NA = not applicable

Poverty Levels

It is estimated that 2.2 percent or 297 households with cesspools on Molokaʻi are below the FPL. While the percent of households assumed to be below the FPL is relatively in line with the rest of the state, Molokaʻi has the largest share of residents living between 100 and 200 percent of the FPL, the highest among any island and more than double the next highest (Hawaiʻi County). This significant share of residents living slightly above the poverty level is likely to result in significant affordability challenges for Molokaʻi residents.

Figure 2.16 shows the locations of Molokaʻi and Maui's cesspools relative to median household incomes and priority upgrade areas. Molokaʻi has Priority 1, 2, or 3 areas. Median household incomes range from $0 to $60,000 (below the affordability threshold), with a concentration of $110,000+ MHIs located in the Kaunakakai area (above the affordability threshold). The Priority 2 location in Upcountry Maui shows a wide range of incomes from $0-$110,000+ with most incomes ranging from $60,000-$100,000 (just below the affordability threshold). Non-priority upgrade areas on Maui show varying MHIs.

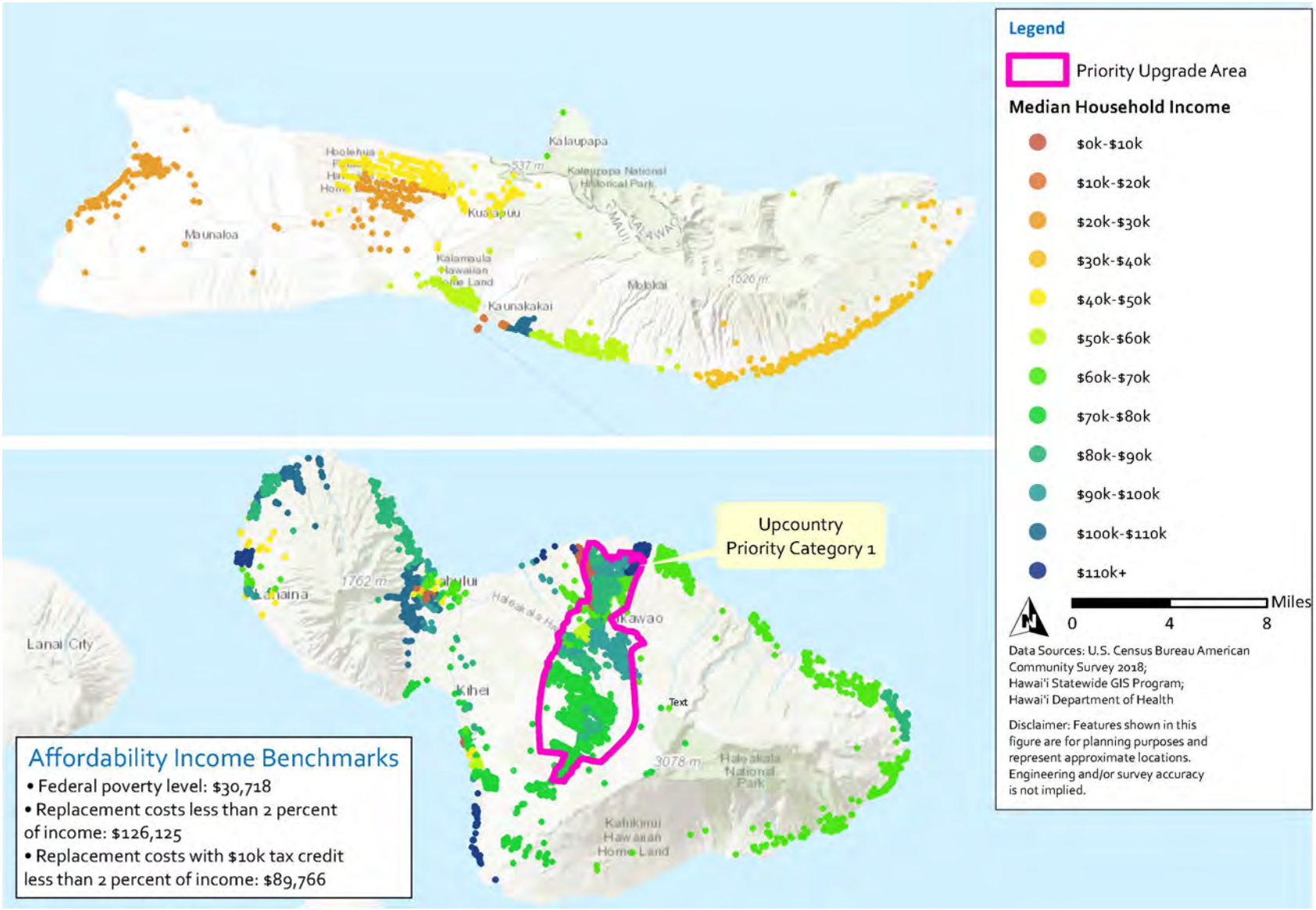

Figure 2.16 Maui and Molokaʻi Cesspools and Median Household Income

2.5 Conclusions & Recommendations

The relative level of financial impact has important implications when allocating grants, loans, and other funding sources to cesspool conversion projects. Additional household level research is recommended prior to making decisions regarding allocation of these funds, but this analysis can guide the next steps as the state considers where to begin making investments and achieve the greatest affordability impact.

Significant affordability challenges are anticipated for cesspool conversions across the state. Table 2.9 summarizes the affordability analysis in terms of the number of cesspool homeowners based on key affordability criteria. It is projected that 97 percent of cesspool homeowners (82,424 homeowners) will pay more than 2 percent of their income for the cesspool conversions. This statistic decreases to 85 percent (71,799 homeowners) when assuming each cesspool homeowner could take advantage of a hypothetical $10,000 rebate. As a result, the conversions are likely to be a significant financial burden at the household level. Furthermore, measures of poverty and income-constraints show that most homeowners have little room in their household budgets for such a significant expense.

The analysis within this TM breaks down the cesspools by priority levels and households with the greatest financial needs. In combination with the funding mechanisms TM, the affordability analysis can be used to target priority areas and/or prioritize financial needs.

Following prioritization of cesspool upgrades, the state can evaluate how to best leverage any funding available to supplement the cost of conversions for households most impacted.

Table 2.9 Summary of the Cesspool Homeowners by County Based on Key Affordability Criteria[1]

Affordability Measure	County of Hawai'i	County of Kaua'i	County of Maui		City and County of Honolulu	Statewide
			Maui	Moloka'i		
Below Federal Poverty Level [2]	3,254	204	416	297	512	4,683
Below 2 Percent Median Household Income [3]						
With $10,000 Rebate	46,359	9,533	9,000	1,241	5,666	71,799
Without Hypothetical $10,000 Rebate	48,303	11,507	11,888	1,439	9,287	82,424

Notes:
(1) Affordability analysis was for the average scenario with $23,000 cesspool upgrade costs, and monthly costs of $210 if the cesspool conversion is financed over 20 years at 4 percent interest.
(2) Federal poverty level is $30,718 annual income.
(3) The 2 percent of median household income threshold is $126,125 annual income based on the USEPA definition of "cost burdened".

2.5.1 Funding Assistance Prioritization

With limited funds available to directly support conversions, it is important for the state to consider where the need for funds are concentrated. From an environmental standpoint, the priority upgrade locations identified in the 2018 Legislature Report are a useful starting point. From an economic standpoint, census block groups where average conversion cost is expected to exceed 2 percent of MHI is also useful.

Using the average conversion cost from Table 2.2, the estimated cost to replace all cesspools organized by 2 percent MHI thresholds and priority upgrade area is outlined in Table 2.10. The estimated conversion cost is provided based on the number of cesspools in each priority category and the affordability criteria. These cost data can be used for preliminary policy discussions and decisions by the CCWG and other advisors.

Table 2.10 Estimated Cost to Replace All Cesspools for Residents by Priority Category and Median Household Income

Priority Category	Number of Cesspools	Total Conversion Cost ($ millions)[1]
Below 2 percent Median Household Income Threshold[2]		
1	98	$2.3
2	179	$4.1
3	589	$13.5
4	1,427	$32.8
Subtotal	**2,293**	**$52.7**
Above 2 percent Median Household Income Threshold[3]		
1	8,434	$194.0
2	14,321	$329.4
3	17,717	$407.5
4	41,952	$964.9
Subtotal	**82,424**	**$1,895.8**
Total	**84,717**	**$1,948.5**

Notes:
(1) Based on average conversion cost of $23,000.
(2) Residents who may be able to afford cesspool conversions without financial assistance.
(3) Residents who are financially burdened by cesspool conversion costs and may require financial assistance.

2.5.2 Private Financing and What Can Be Afforded

To determine the amount of financial assistance that may be needed, it is also important to consider the portion of the cesspool conversions costs that *can* be afforded by homeowners. With the exception of those with estimated annual income below the FPL, it was assumed that homeowners could afford to privately finance an amount that results in a monthly payment less than or equal to 2 percent of their estimated monthly income less the average monthly maintenance cost for the selected replacement technology. If that amount is less than the average of conversion costs, it is assumed the difference would require financial aid. Table 2.11 summarizes the estimated amount of conversion costs that can be afforded or privately financed versus the amount of financial aid that may be required. It is anticipated that more than $900 million in financial aid is required to support cesspool conversions for homeowners who are financially burdened.

Table 2.11 Estimated Private Financing and Financial Aid Required for Cesspool Conversions[1]

Priority	Total Private Financing[2] ($ million)	Total Financial Aid Required[3] ($ million)
1	$89.8	$106.5
2	$94.2	$239.3
3	$164.7	$256.3
4	$557.6	$440.1
Totals	**$906.3**	**$1,042.2**

Notes:
(1) Based on average conversion cost of $23,000.
(2) Assumes residents can afford up to 2 percent of estimated household income for cesspool conversions, financed at 4 percent interest over 20 years.
(3) Assumes cesspool conversion costs in excess of 2 percent of estimated household income will require financial aid. Residents with income levels below the federal poverty limit are assumed to require financial support for all conversion costs.

2.6 References

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Appendix A

DOH OSWT AND DISPOSAL SYSTEM INSTALLATION COST DATA

Average	$22,905.43
Median	$21,989.52
Max	$59,585.00
Min	$8,925.00
90th Percentile	$37,809.20
10th Percentile	$9,927.19

TMK	Address	Cost	Type	Bedrooms
141024003	41-890 Kakaina St., Waimanalo, Hawaii 96795	$21,204.18	ST	5
144023021	714 Old Mokapu Rd., Kailua, Hawaii 96734	$40,837.86	ST	5
146001030	46-047 Lilipuna Road, Kaneohe, Hawaii 96744	$38,972.00	ST	5
146017037	46-398 Holopu Place, Kaneohe, Hawaii 96744	$11,370.61	ST	5
146027028	46-426 Hololio Street, Kaneohe, Hawaii 96744	$30,062.00	ST	5
147014004	47-719 Kamehameha Hwy, Kaneohe, Hawaii 96744	$9,582.00	ST	5
147014004	47-719 Kamehameha Hwy, Kaneohe, Hawaii 96744	$9,582.00	ST	5
147014004	47-719 Kamehameha Hwy, Kaneohe, Hawaii 96744	$9,582.00	ST	5
147014004	47-719 Kamehameha Hwy, Kaneohe, Hawaii 96744	$9,582.00	ST	5
147014004	47-719 Kamehameha Hwy, Kaneohe, Hawaii 96744	$9,582.00	ST	5
147014030	47-121 Wailehua Road, Kahaluu, Hawaii	$38,221.76	ST	5
147046041	47-521 Melekula Rd., Kaneohe, Hawaii	$17,257.17	ST	5
153001016	53-133 Kamehameha Hwy, Hauula, Hawaii 96717	$28,803.00	ST	5
153002033	53-231 Kamehameha Highway, Hau'ula, Hawaii	$28,324.00	ST	5
153002046	53-215 Kamehameha Highway, Hauula, Hawaii	$32,971.62	ST	5
153003001	53-270 Kamehameha Hwy, Hauula, Hawaii 96717	$23,870.20	ST	5
154011038	56-233 Kamehameha Hwy, Hauula, Hawaii 96717	$21,989.52	ST	5
154012035	54-267 Kaipapau Loop, Hauula, Hawaii 96717	$22,000.00	ST	5
154018042	54-140 Kawaipuna Street, Hauula, Hawaii 96717	$22,700.00	ST	5
156001079	44-497 Kaneohe Bay Drive, Kaneohe, Hawaii 96744	$20,000.00	ST	5
157005003	57-477 Kamehameha Hwy, Kahuku, Hawaii	$26,476.24	ST	5
159003024	05-601 B Ke Iki Road, Haleiwa, Hawaii 96712	$24,432.72	ST	5
161012035	61-307 Kamehameha Hwy, Haleiwa, Hawaii 96714	$29,719.16	ST	5
166021020	66-437 Waialua Beach Road, Haleiwa, Hawaii 96712	$22,513.08	ST	5
167002021	67-631 Kahui Street, Waialua, Hawaii 96791	$19,750.00	ST	5
167008018	67-371 Kukea Circle, Waialua, Hawaii	$10,489.33	ST	5
167015044	67-007 Kahaone Place, Waialua, Hawaii 96791	$30,366.48	ST	5
168012009	66-136 Akule Street, Haleiwa, Hawaii 96791	$11,735.10	ST	5
168012017	68-147 Akule Street, Waialua, Hawaii 96791	$23,000.00	ST	5
223003063	2850 Omaopio Road, Kula, Hi 96790	$41,674.00	ST	5
235001007	310 Iao Valley Road, Wailuku, Hawaii 96793	$10,497.73	ST	5
235001105	11 Ua Place, Wailuku, Hawaii 96793	$14,698.15	ST	5
336010007	36-2270 Hawaii Belt Rd., Laupahoehoe, Hawaii 96764	$8,925.00	ST	5
413010033	8706 Kiowea Road, Kekaha, Hawaii 96752	$21,945.00	ST	5
424001026	2-3161 C Kaumualii Hwy, Kalaheo, Hawaii 96741 (Cesspool 1)	$25,965.00	ST	5
432003009	2461 Niumalu Road, Lihue, Hawaii 96766	$25,500.00	ST	5
432003009	2461 Niumalu Road, Lihue, Hawaii 96766	$25,500.00	ST	5
444002075	6611 Kipapa Road, Kapaa, Hawaii 96746	$27,297.00	ST	5
448013018	4721 Aliomanu Road, Anahola, Hawaii 96703	$35,070.00	ST	5
455001001	5069 Weke Road, Hanalei, Hawaii 96714	$22,510.87	ST	5
214005019	4933 Uakea Rd, Hana, Hawaii 96713	$59,585.00	ATU	5
455010067	5-5016 Kuhio Hwy, Hanalei, Hawaii 96714	$38,000.00	ST	5
424005037	2931 Wawae Road, Kalaheo, Hawaii 96741	$52,356.00	ST and 2	5
425006033	3641 Lawaiuka Rd., Lawai, Hawaii	$37,046.00	ATU	5
425006036	3644 Lawaiuka Road, Lawai, Hawaii 96765	$21,760.00	ATU	5
425006036	3644 Lawaiuka Road, Lawai, Hawaii 96765	$21,760.00	ATU	5
458012014	5-6920 Kuhio Highway, Wainiha, Kauai, Hawaii	$26,338.57	ATU	5
141005029	41-038 Manana Street, Waimanalo, Hawaii 96795	$28,248.00	ST	4

OSWT Installation Costs from DOH

Average	$22,905.43
Median	$21,989.52
Max	$59,585.00
Min	$8,925.00
90th Percentile	$37,809.20
10th Percentile	$9,927.19

TMK	Address	Cost	Type	Bedrooms
142103019	653 Manu Oo Street, Kailua, Hawaii 96734	$27,925.00	ST	4
144024060	68-505 Crozier Drive, Waialua, Hawaii 96791	$36,393.00	ST	4
158003089	58-034 Kapuai Place, Haleiwa, Hawaii 96712	$12,300.85	ST	4
159003042	05-605 Ke Iki Road, Haleiwa, Hawaii 96712	$31,308.89	ST	4
159004027	59-783 Kamehameha Hwy, Haleiwa, Hawaii 96712	$19,800.00	ST	4
159004027	59-783A Kamehameha Hwy, Haleiwa, Hawaii 96712	$19,800.00	ST	4
159004034	1931 Alaweo Street, Honolulu, Hawaii 96712	$45,550.00	ST	4
167006075	67-464 Haona St., Waialua, Hawaii	$21,170.68	ST	4
167006079	67-480 Haona Street, Waialua, Hawaii 96791	$11,050.76	ST	4
324021141	119 Likeke Street, Hilo, Hawaii	$9,786.65	ST	4
324061033	1621 Maunakai Street, Hilo, Hawaii, 96720	$11,826.58	ST	4
362010013	62-1148 Puahia Street, Kamuela, Hawaii	$10,692.19	ST	4
436008001	2922 Waa Road, Lihue, Hawaii 96766	$32,500.00	Presby	4
153014026	53-018 Pokiwai Pl., Hauula, Hawaii 96717	$20,000.00	ATU	3
167014030	67-003 Kaimanu Place, Waialua, Hawaii 96791	$24,159.58	Presby	3
199017039	99-118 Ululaau Place, Aiea, Hawaii 96701	$33,000.00	ST	3
214005023	4893 Uakea Rd, Hana, Hawaii 96713	$32,186.00	ST	3
235005038	3075 Alaneo Place, Wailuku, Hawaii 96793	$45,796.56	ST	3
321011001	39 Apapane Road, Hilo, Hawaii 96720	$10,500.00	ST	3
322019075	121 Barenaba Lane, Hilo, Hawaii 96720	$20,000.00	ST	3
323026057	277 Kaiulani Street, Hilo, Hawaii 96720	$14,789.62	ST	3
325024051	60 Kapaa Street, Hilo, Hawaii 96720	$9,525.00	ST	3
325028016	2065 Waianuenue Ave., Apt M, Hilo, Hawaii 96720-1207	$9,399.47	ST	3
326016013	442-A Wainaku Street, Hilo, Hawaii 96720	$11,561.00	ST	3
326016013	442-A Wainaku Street, Hilo, Hawaii 96720	$11,561.00	ST	3
326026006	18 Makakai Place, Hilo, Hawaii	$16,666.56	ST	3
382005008	82-6301 Puuhonua Rd., Captain Cook, Hawaii	$11,790.00	ST	3
442018040	374 Molo Street, Kapaa, Hawaii 96746	$25,000.00	ATU	3
455001029	5063-A Weke Road, Hanalei, Hawaii	$17,842.00	ST	3
314010013	14-4707 Alapaki Lane, Pahoa, Hawaii, 96778	$18,706.00	ATU	2
214005022	4896 Uakea Rd, Hana, Hawaii 96813	$26,406.00	ST	2
314010044	14-4949 Laimana Avenue, Pahoa, Hawaii 96778	$10,500.00	ST	2
343013043	43-2013 Paauilo Mauka Road, Paauilo, Hawaii 96776	$12,400.00	ST	2
227004002	77 Nahele Road, Haiku, Hawaii	$10,813.00	ST	1
456004008	5-5851 Kuhio Highway, Hanalei, Hawaii, 96714	$28,792.00	ST	1

Appendix B

ALTERNATIVE AFFORDABILITY MEASURES

Hours of Labor at Minimum Wage

Table B.1 summarizes the statewide results for the equivalent hours of minimum wage (HM) to pay for cesspool upgrades for the low, average, and high cost scenarios. For the entire state of Hawai'i, the average conversion cost scenario would require approximately 21 hours per month of labor at minimum wage in order to pay for cesspool conversion and maintenance costs, with a low- and high-end estimate of 10 and 34 hours respectively.

The HM metric was created to measure affordability as opposed to define it, however, there are no widely accepted guidelines or benchmarks for contextualizing HM. Eight hours or roughly a full day of work at minimum wage has been suggested a starting point for measuring affordability for water and wastewater service using the HM metric.[1] Like the MHI analysis, the HM analysis shows that the cesspool conversion program would prove to be a significant financial burden for many property owners, with the average conversion cost requiring more than three times as many hours at minimum wage, before even accounting for sewer costs.

Table B.1 Statewide Estimate for Hours of Minimum Wage Labor Needed for Cesspool Costs

Cost Description	Cesspool Conversion Cost Scenario		
	Low Cost	Average Cost	High Cost
Monthly Installation Repayment Cost	$61	$139	$230
Monthly Operating Cost	$33	$71	$109
Total Monthly Cesspool Conversion Cost	$94	$210	$339
Hours per Month of Labor at Minimum Wage	10	21	34

Notes:
(1) Based on the minimum, maximum, and median for water providers surveyed.

ALICE

The Federal Poverty Level (FPL) provides a benchmark for determining what households can be considered "impoverished" and thus qualify for assistance and support programs, but there is often a large segment of households that are above this threshold but struggle to make ends meet with their income. In fact, the FPL is so low for most states, that many references to the FPL are in terms of multiples of FPL, e.g. 200% of FPL or 400% of FLP. "The FPL, with its minimal and uniform national estimate of the cost of living, far underestimates the number of households that cannot afford to live and work in the modern economy" (ALICE Report, 2020).

Asset Limited, Income Constrained, Employed (ALICE is one measure used to define households who may not qualify for aid under FPL measures but still have significant challenges making ends meet. ALICE Household Budgets are intended to provide a more realistic estimate of how much income is necessary to both live and work in a given geography. This economic indicator has been in existence for about a decade. The 2018 ALICE Household Survival Budget for a family of four in Hawai`i is estimated at $90,828 per year (United for ALICE, 2020). This compares to the FPL for a family of four estimated at $28,870 in 2018. There have been 3 reports published based on 2016, 2017 and 2018 data. It typically takes about 2 years to analyze the data. Therefore, the current 2020 ALICE report is based on 2018 data.

[1] Teodoro, 2018.

While ALICE indicators are prepared for each state through census data, approximately 20 states[2] actively support additional economic research in their respective states to further understand the drivers of economic challenges in their communities. This research is led by a 27-person national advisory committee that represents the various states, including Hawai`i and is tasked with making sure that the data and research are applied independently and consistently towards the development of ALICE models and tools.

The ALICE budget is comprised of 9 categories indicated in below, with sources of data:

	CATEGORY	SOURCE
1.	Housing	HUD (State Dept of Housing and Urban Development)
2.	Child Care	State registered childcare homes
3.	Food	USDA's Thrifty Food Plan
4.	Transportation	AAA and Federal Hwy Administration
5.	Health Care	MEPS (Medical Expenditure Panel Survey) – a national database of medical spending
6.	Technology	Consumer Reports
7.	Taxes	Federal, state, and local taxes estimates from IRS and Tax Foundation
8.	Savings	No source reported
9.	Miscellaneous	Estimated at 10% of budget

The main conclusions of the most recent ALICE report for Hawai`i indicate a troubling trend. Despite strong economic growth until COVID-19 impacts hit the state in March 2020, the number of ALICE households rose from 22% in 2007 to 33% in 2018. The total number of households in Hawai`i is estimated at 455,100. This trend is exacerbated by the recent COVID-19 impacts with the ALICE report estimating that an additional 35,000 households would become ALICE households by the end of 2020.

As mentioned earlier, these data are compiled by local researchers using a standard methodology for calculating Hawai`i based costs for the 9 categories mentioned previously. The ALICE Research Advisory Committee for Hawai`i was comprised of the following individuals:

- Kathy Fujihara-Chong, M.B.A., HMSA
- Beth Giesting, M.S., Hawai'i Budget & Policy Center
- Janice Ikeda, M.A., Vibrant Hawai'i
- Joyce Lee-Ibarra, M.S., JLI Consulting
- Ivette Rodriguez Stern, M.S.W., University of Hawai'i, Center on the Family
- Janice Takahashi, M.U.R.P., State of Hawai'i, Hawai'i Housing Finance and Development Corporation
- Gavin Thornton, J.D., Hawai'i Appleseed Center for Law and Economic Justice
- Hua Zan, Ph.D., University of Hawai'i, Center on the Family

[2] AK, CT, FL, HI, ID, IL, IN, IO, LA, MA, MI, NJ, NY, OH, OR, PA, TN, TX, VA, WA and WI

Affordability Results by ALICE Statewide

Across the state, it is estimated that only 6 percent of homeowners with a cesspool reside in a census block group with an MHI below the federal poverty level or $30,718. However, over three-quarters of CBG would fall below the ALICE threshold.

This difference between the FPL and ALICE metrics highlights the significant challenges many residents face when paying for basic utilities like wastewater. Their income puts them above the thresholds often used for state and federal income assistance, but it is not enough to comfortably afford basic services. The ALICE metric aims to highlight this group of residents.

Figure B.1 shows the ALICE metric by county and statewide. Statewide, 85 percent of cesspool owners fall within the ALICE household metric. The County of Hawai`i has the most cesspool owners that fall within the ALICE household metric with 96 percent, followed by the County of Kaua`i (83 percent), County of Maui (76 percent), and the City and County of Honolulu (53 percent).

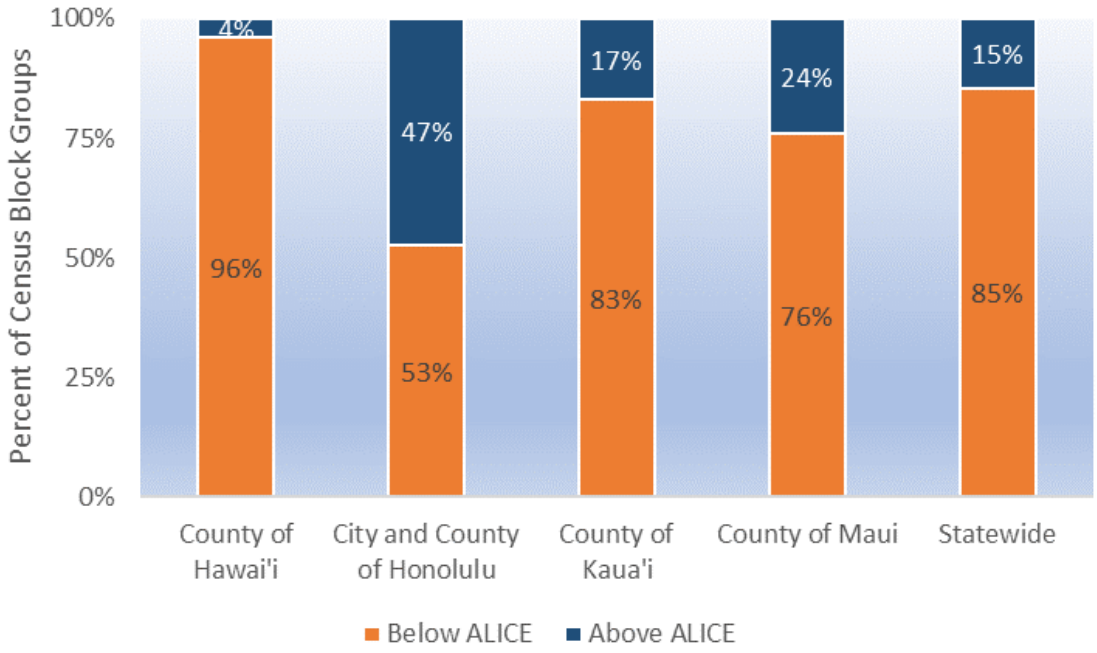


Figure B.1 Percent of Cesspool Homeowners by Census Block Groups and Asset Limited, Income Constrained, Employed (ALICE) Household Budgets

Figure B.2 depicts the income distribution for cesspools owners across the state, based on the median household income for the Census Block Group of the cesspool. Also shown is the annual income that would be needed for the cost of conversion to fall at or below 2 percent of income without the rebate ($126,125). For those cesspool owners who are eligible to apply for and receive the $10,000 rebate, the adjusted average cost of cesspool conversion is approximately $150 per month, which is 2 percent of an annual income of $89,766. The ALICE income threshold ($90,828) is also shown for comparison as the green, dashed line.

Table B.2 summarizes the affordability analysis in terms of the number of cesspool homeowners based on FLP, ALICE, and median household income. It is projected that 97 percent of cesspool homeowners (82,424 residents) will pay more than 2 percent of their income for the cesspool conversions. This statistic decreases to 85 percent (71,799 homeowners) when assuming each cesspool homeowner could take advantage of a

hypothetical $10,000 rebate. Using the ALICE household survival budget, 85 percent (72,487 residents) statewide will be financially burdened by the costs of cesspool upgrades without financial assistance. As a result, the conversions are likely to be a significant financial burden at the household level. Furthermore, measures of poverty and income-constraints show that most homeowners have little room in their household budgets for such a significant expense.

The following sections summarize the affordability analyses using the ALICE metric by county.

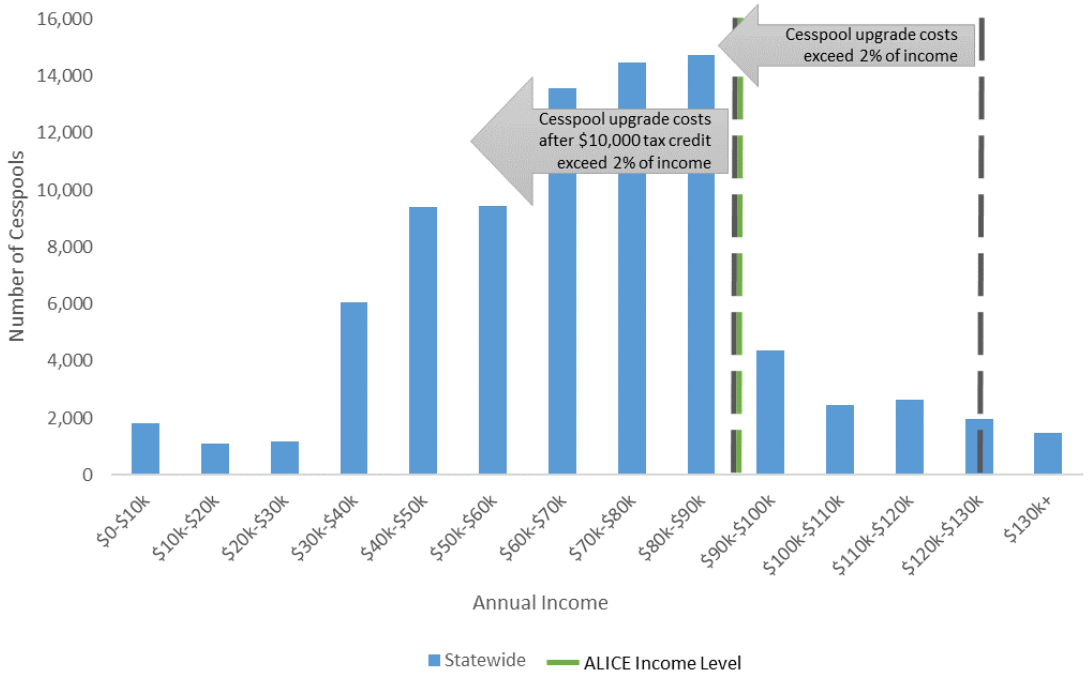


Figure B.2 Statewide Median Household Income Levels and Estimated Conversion Cost as Percent of Annual Income

Table B.2 Summary of the Cesspool Owners by County Based on Key Affordability Criteria

Affordability Measure	County of Hawai'i	County of Kaua'i	County of Maui		City and County of Honolulu	Statewide
			Maui	Moloka'i		
Below Federal Poverty Level(2)	3,254	204	416	297	512	4,683
Below ALICE Household Survival Budget(3)	46,359	10,094	9,104	1,241	5,689	72,487
Below 2 Percent Median Household Income(4)						
With Hypothetical $10,000 Rebate	46,359	9,533	9,000	1,241	5,666	71,799
Without Hypothetical $10,000 Rebate	48,303	11,507	11,888	1,439	9,287	82,424

Notes:
(1) Affordability analysis was for the average scenario with $23,000 cesspool upgrade costs, and monthly costs of $210 if the cesspool conversion is financed over 20 years at 4 percent interest.
(2) Federal poverty level is $30,718 annual income. Residents who have household incomes below the federal poverty level are likely to require financial assistance for cesspool conversions.
(3) Asset Limited, Income Constrained, Employed (ALICE) Household Survival Budget is $90,828 annual income for a family of four. Residents who have household incomes below ALICE level may be financially burdened by the costs of cesspool conversions.
(4) The 2 percent of median household income threshold is $126,125 annual income based on USEPA definition of "cost burdened". Residents who are financially burdened by cesspool conversion costs and may require financial assistance.

County of Hawai`i - ALICE Levels

Like the state as a whole, the majority of the County of Hawai`i's cesspool homeowners have incomes above the FPL. However, Hawai`i County has the most homeowners with cesspools that are considered below the ALICE threshold (94 percent), and thus under significant financial strain to afford the cesspool conversion costs. With such a large portion homeowners below the ALICE budget threshold, most Hawai`i County cesspools homeowners cannot afford cesspool upgrades without significant funding support.

City and County of Honolulu – ALICE Levels

The City and County of Honolulu has approximately 5 percent of cesspools located in Census Block Groups where the median household income is below the Federal Poverty Level. Notably though, the County has the lowest percentage of cesspools assumed to be below the ALICE threshold at 47 percent. This is nearly double the rate for Maui, the next highest county at 24 percent. This likely reflects the disparate income distribution across the City and County of Honolulu, with high levels of homeowners at both ends of the income spectrum.

County of Kaua`i – ALICE Levels

The County of Kaua`i has the smallest share of residents assumed to be living below the FPL across all counties in Hawai`i at 2 percent. Despite this low number, there is a significant percentage of residents that would fall below the ALICE survival budget threshold, with 83 percent of Kaua`i's cesspool owners assumed to be under this threshold. It is unlikely that these homeowners will be able to afford cesspool conversion costs without additional funding resources

Island of Maui – ALICE Levels

It is estimated that 3 percent of residents on Maui are below the FPL, while 75 percent of residents are estimated to fall below the ALICE threshold.

Island of Moloka`i – ALICE Levels

It is estimated that 3 percent of residents on Moloka`i are below the FPL, while 86 percent of residents are estimated to fall below the ALICE threshold. While the percent of households assumed to be below the FPL is relatively in line with the rest of the state, Moloka`i has the largest share of residents living between 100 and 200 percent of the FPL, the highest among any island and more than double the next highest (Hawai`i County). This significant share of residents living above the poverty level but by a very small amount is likely to result in significant affordability challenges for Moloka`i residents.

Appendix C

AFFORDABILITY ANALYSIS BY STATE LEGISLATIVE DISTRICT

Table C.1 Hawai'i County House District Affordability Measures

House District	Cesspools	Percent of Residents with Cesspools with Household Incomes Below FPL	Percent of Residents with Cesspools with Household Incomes Below ALICE	Percent of Residents with Cesspools Projected to Spend >2 percent of Household Income on Cesspool Conversion
1	7,568	5	100	100
2	5,159	11	92	100
3	8,742	0	100	100
4	9,334	15	100	100
5	7,100	13	94	94
6	4,845	0	93	93
7	5,549	0	85	85

Table C.2 Maui County House District Affordability Measures

House District	Island	Cesspools	Percent of Residents with Cesspools with Household Incomes Below FPL	Percent of Residents with Cesspools with Household Incomes Below ALICE	Percent of Residents with Cesspools Projected to Spend >2 percent of Household Income on Cesspool Conversion
8	Maui	1,062	1	50	50
9	Maui	205	21	47	53
10	Maui	849	0	71	71
11	Maui	1,016	1	96	96
12	Maui	6,212	0	75	99
13	Maui	2,740	14	80	91
13	Moloka'i	1,434	16	85	85

Table C.3 Kaua'i County House District Affordability Measures

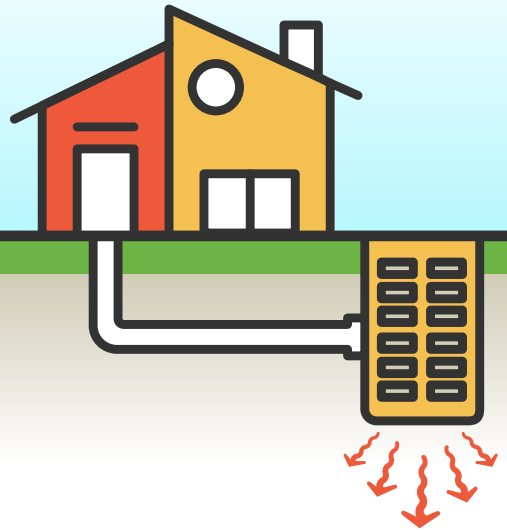
House District	Cesspools	Percent of Residents with Cesspools with Household Incomes Below FPL	Percent of Residents with Cesspools with Household Incomes Below ALICE	Percent of Residents with Cesspools Projected to Spend >2 percent of Household Income on Cesspool Conversion
14	4,679	2	87	94
15	2,838	2	83	83
16	4,568	0	80	85

Table C.4 City and County of Honolulu House District Affordability Measures

House District	Cesspools	Percent of Residents with Cesspools with Household Incomes Below FPL	Percent of Residents with Cesspools with Household Incomes Below ALICE	Percent of Residents with Cesspools Projected to Spend >2 percent of Household Income on Cesspool Conversion
17	164	1	1	1
18	139	0	4	12
19	346	3	25	40
20	144	0	49	70
21	23	9	100	100
22	84	1	95	96
23	133	5	25	34
24	431	0	9	9
25	165	5	55	56
26	114	24	71	81
27	89	6	60	70
28	31	0	23	55
29	136	1	88	100
30	310	62	95	95
31	23	17	83	83
32	8	0	63	63
33	133	7	10	11
34	16	0	63	94
35	52	25	58	100
36	54	0	37	37
37	25	0	52	72
38	17	0	53	53
39	87	0	61	61
40	963	0	41	54
41	126	2	32	50
42	117	0	59	67
43	540	30	99	99
44	828	5	58	100
45	836	0	100	100
46	44	0	70	100
47	2,785	0	56	64
48	849	0	42	42
49	181	8	10	12
50	159	0	1	1
51	577	0	25	70

Appendix C

Example Public Outreach Handout



RULES ARE CHANGING FOR YOUR

HOME CESSPOOL

CESSPOOLS NEED TO GO!

Cesspools are underground wells used to dispose of household wastewater into the groundwater table. In 2017, the Hawaii State Legislature passed Act 125 requiring the replacement of all cesspools by 2050 to prevent environmental contamination. Cesspools pose a high risk to drinking water sources and coastal ecosystems. Even if you don't plan on being in your house in 2050, having a cesspool will negatively effect the resale value of your home.

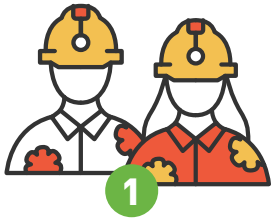
HOW DO I KNOW IF I HAVE A CESSPOOL?

You probably **don't** have a cesspool if:

- You pay a sewer bill or sewer charge on your water bill.
- Your home was built recently.
- An alternative wastewater system other than a cesspool is shown at your residence on the "OSDS" map found here: **geoportal.hawaii.gov**

Inquire with the Department of Health if you're unsure of whether or not you have a cesspool!

OK, SO HOW DO I FIX IT?



1. Hire a licensed civil engineer to help you make a plan

2. Submit your plan to the Department of Health for approval

3. Hire a licensed contractor to build new system

4. Engineer submits inspection report for approval

CAN I AFFORD THIS?

Check out our local financing options.

Typical replacement costs range from $9,000 to more than $60,000. For current financing opportunities, contact the Department of Health or visit their website listed below.

State or County Support (if available)

Home Refinancing

Federal Grants and Loans (if available)

For additional information contact the Department of Health at 808-586-4294 or visit their website at **health.hawaii.gov/wastewater**

CESSPOOL ALTERNATIVES

Different locations will require different levels of treatment! Follow this guide for an idea of what system you may need and then get in touch with a local engineer for a personalized estimate as prices may vary.

Is your property near an existing sewer system?

Recommendation: A

Is your property small[1], sloped[2], upcountry[3], in a floodzone, or near a body of water[4]?

Recommendation: B + C + D

None of the above?

Recommendation: B + D

1 Less than 10,000 sf

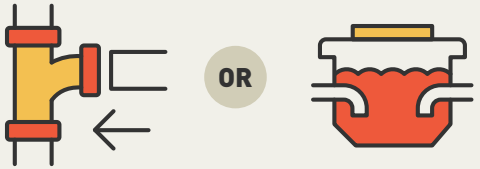
2 Slope greater than 8%

3 Mauka of the UIC line (a boundary protecting drinking water aquifers)

4 Within 1,000 ft of a drinking water source, 50 ft of a waterbody, or 3 ft of water table

SEWER CONNECTION OR BASIC TREATMENT

Every property will need to either connect to an existing sewer system or install a septic tank to treat wastewater onsite! Septic tanks need annual maintenance while a sewer connection means you'll get a monthly sewer bill!



A Existing Sewer System

This is the lowest maintenance option but there is a connection fee and a monthly sewer bill!

B Septic Tank

This tank settles out and breaks down solids, which then need to be pumped out every few years by a licensed contractor.

C ADDITIONAL TREATMENT

Homes using onsite treatment near a vulnerable water resource need additional treatment with their septic tank to reduce the amount of nutrients discharged into the environment.

Alternative Toilets

These waterless toilets don't produce wastewater! The septic tank handles the rest of the water from your house.

OR

Aerobic Treatment

In this case, the septic tank is smaller and an aerated zone is added for additional treatment.

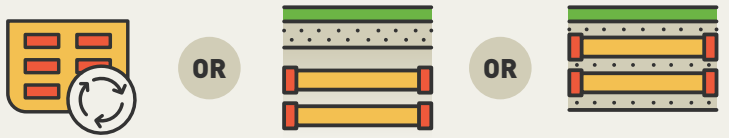
OR

Biofilter

A media like sand or gravel is used to polish the water leaving your septic tank.

D DISPOSAL

Treated water needs to be fed back into the ground.



Seepage Pit

Converting your cesspool into a seepage pit is the cheapest option but it's not always allowed.

Absorption Field

Tubes with tiny holes spread wastewater out underground so it can filter through the soil.

Evapotranspiration

This option is the same as the absorption field except it's shallow so the water feeds your plants then evaporates.

For additional information contact the Department of Health at 808-586-4294 or visit their website at **health.hawaii.gov/wastewater**