Recommendation & SWOT Form 13

RECOMMENDATION SUMMARY
Reduce Daily Flow Rates: Reduce the minimum absorption area design flow for individual wastewater systems from 200 gallons per day to 150 gpd/bedroom, This reflects that the current design flow requirements predate modern low-flow fixtures and water conservation practices.

INTERNAL FACTORS

STRENGTHS +	WEAKNESSES –

• Updates an outdated standard to reflect real usage
• Reduces system footprint and construction costs.
• Aligns Hawaii with most U.S. States
• Oversized systems negatively impact the effectiveness of natural, biological treatment processes
	• Reduced redundancy for high-occupancy or multi-generational households.
	  ○ Even with reduced estimated flow rates, there is already redundancy to cover these outliers.
	  ○ See Additional Information (Bullet 2)
	• Less conservative buffer for future household growth.

EXTERNAL FACTORS

OPPORTUNITIES +	THREATS –
• Reduces construction costs significantly. • Accelerates the path toward the 3,000 cesspools/year target. • Makes cesspool conversion feasible for homeowners with small lots who currently cannot meet leachfield sizing requirements. • Supports landowners with limited financial and spatial resources	• A small percentage of households may have genuinely higher water use. • Without monitoring, undersized systems could fail in high-occupancy situations.

ADDITIONAL INFORMATION

- Hawai'i's 200 gpd/bedroom rate is tied for the second highest in the country. Alternative models from other states:
  - Washington State uses a 120 gpd/bedroom flat rate;
  - New Mexico scales from 150 gpd for a 1-bedroom to ~50 gpd per additional bedroom.
  - Vermont assumes 2 people per bedroom for the first 3 bedrooms, then 1 person per bedroom after that, at 70 gpd/person.
  - Massachusetts' Title 5 uses a nutrient loading calculation to set a 110 gpd/br flow rate.
- Hawaii adopted IAPMO's Water Demand Calculator (WDC), published as UPC Appendix M, into the Hawaii Plumbing Code 2021 (Hawaii Plumbing Code §M 102.2). Hawaii was among the first ten states nationally to adopt Appendix M. The WDC replaced Hunter's Curve, an outdated pipe-sizing methodology, with an updated probability model built on data from over 1,000 single-family homes. Its adoption shows that Hawaii has already accepted reduced residential flow rates when sizing plumbing fixtures, and should be consistent when sizing wastewater disposal systems.
- Relevant code sections:
  - 200 gpd/br: HAR 11-62-34(a)(2)(A), HAR 11-62-34(c)(2)(A), HAR 11-62-34(d)(2)(B)
  - Maximum daily flow rate: HAR 11-62-31.1(a)(1)(D), HAR 11-62-33.1(a)(5)

*Once completed, please email this form to **doh.wwb.cesspool@doh.hawaii.gov**.*

Recommendation & SWOT Form

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RECOMMENDATION SUMMARY
Create Pathways for Adopting Innovative Technologies: Establish a clear, codified pathway in HAR 11-62 for testing, piloting, and approving innovative wastewater system technologies. Currently, no process exists to prescribe testing and application procedures, as listed in Point 1 in Additional Information. This can cause technology companies to abandon efforts to enter the Hawai'i market and limit the range of affordable solutions available to homeowners and communities. For example, Vermont utilizes "General Use Approval," "Experimental Approval," and "Pilot Approval" with defined timelines and criteria that can operate within the variance framework (see Point 3 in Additional Information). DOH will publish and maintain a list of technologies that have been approved for general, experimental, or pilot use.

INTERNAL FACTORS

STRENGTHS +	WEAKNESSES –
• Accelerates adoption of more effective, affordable treatment solutions. • Creates regulatory certainty that attracts investment from technology companies.	• DOH capacity constraints may slow down technology evaluations without adequate staffing or use of technical advisory groups, there is risk of creating a backlog. • Experimental systems require careful monitoring protocols.

EXTERNAL FACTORS

OPPORTUNITIES +	THREATS –
• Attracts water and wastewater technology companies to establish a presence in Hawaii. • Enables WRRC and UH to serve as local testing sites, generating locally-derived data that could be used to accelerate progress and inform decision-making. • Opens pathways for community-scale, modular, and nature-based systems suited to rural island communities	• Risk of approving technologies that are ill-suited for Hawaii's unique environmental and geological conditions. • Without robust RME structures in place, innovative systems can become difficult to enforce.

• Public list for approved technologies provides a central location for engineers to identify treatment solutions and facilitates adoption of new technologies.	

ADDITIONAL INFORMATION
1. The Cesspool Conversion Working Group's Technical Memorandum "Assessment of Onsite Treatment Technology Testing and Approval Procedures Utilized by Other States" noted that the current process for obtaining approval of Innovative, Alternative, and Emerging (IAE) technologies does not prescribe application procedures including: ◦ fees ◦ timelines ◦ testing durations ◦ sampling protocols ◦ performance requirements ◦ renewal periods. 2. DOH does not currently certify alternative, innovative, and emerging technologies or maintain a state-approved list of these technologies. 3. Models like Vermont's tiered pilot permit system (Vermont's Wastewater System Rules (Subchapter 4)) demonstrate the feasibility of a codified pathway with three tiers: general use, experimental, and pilot permits. 4. New Mexico's performance-based standards allow alternative permits tied to secondary, tertiary, and disinfection treatment benchmarks.

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Recommendation & SWOT Form 15

RECOMMENDATION SUMMARY

Reduce Disposal System Size Based on Advanced Treatment: Establish standardized absorption bed size reductions tied to demonstrated effluent treatment quality (also need to define absorption beds in definitions):

- 33% reduction where the treatment system achieves NSF40 or equivalent guidelines (30 day average BOD5 ≤ 25 mg/L, TSS ≤ 30 mg/L)
- 50% where the system achieves NSF245 or equivalent guidelines (30-day average BOD5 ≤ 25 mg/L, TSS ≤ 30 mg/L, TKN removal ≥ 50%) with soil percolation faster than 30 min/in. A groundwater mounding analysis shall be completed by a professional engineer using the Darcy Equation where a 50% reduction is applied in a smaller footprint to ensure the concentrated hydraulic load doesn't induce groundwater rise.

Qualification for these reductions may be demonstrated via either:

1. NSF/ANSI 40 certification (33% reduction) or NSF/ANSI 245 certification (50% reduction) as a fast-path presumption of compliance; or
2. Annual inspections and field monitoring data or third-party laboratory testing demonstrating equivalent effluent quality as approved by the Director.

INTERNAL FACTORS

STRENGTHS +	WEAKNESSES –
• Codifies existing DOH variance practice into predictable standards. • Reduces project cost significantly • Opens the path to non-NSF systems, offering more affordable and ecologically appropriate solutions for rural communities	• The standard reduction may not apply in soils with low percolation rates, limiting applicability in some areas.

EXTERNAL FACTORS

OPPORTUNITIES +	THREATS –

• Expands the number of properties that are able to complete cesspool conversions by establishing a predictable treatment standard to reduce required land area. • Higher-treated effluent is better suited for vegetative uptake and soil enhancement in the dispersal zone, leading to better ecological outcomes. • Creates incentives for higher treatment by lowering total project costs.	• Absorption trench or bed may underperform if the treatment unit fails or is not properly maintained.

ADDITIONAL INFORMATION

1. Washington State allows 50% reduction for NSF40. Florida allows 40%. Pennsylvania allows 33%. None require NSF certification specifically, only that the system meets state-defined performance standards.
2. DOH has already issued informal variances of up to 40% for NSF245. Codifying this practice reduces costs and eliminates the need for case-by-case variance applications for each conversion project, which can add administrative strain.
3. Performance thresholds for treatment works are defined in existing HAR 11-62-26 effluent monitoring requirements. Aligning IWS design standards with established parameters creates regulatory consistency.

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Recommendation & SWOT Form 16

RECOMMENDATION SUMMARY
Retrofit Cesspools into Seepage Pits: Revise the seepage pit section under HAR 11-62-34(d) to authorize the use of structurally sound, existing cesspool excavations as the dispersal structures for an individual wastewater system (IWS) when the treatment system produces advanced effluent quality of NSF/ANSI 245 or demonstrated equivalent (see Point 1 in Additional Information).

INTERNAL FACTORS

STRENGTHS +	WEAKNESSES –
• Dramatic cost reduction by eliminating excavation, lining, and ring installation costs on lava, rocky, or space-constrained lots. • The requirement for advanced secondary effluent establishes a higher standard than applied to conventional seepage pits receiving primary effluent, justifying a basis for less stringent lining requirements. • Performance-based eligibility ensures any technology that achieves the required treatment level qualifies, including nature-based solutions.	• Applicable primarily to properties where existing cesspool infrastructure is structurally sound, which requires professional engineering certification of structural integrity. Excludes collapsed or compromised structures. • Advanced secondary treatment maintenance contracts add an ongoing cost

EXTERNAL FACTORS

OPPORTUNITIES +	THREATS –
• Opens cesspool conversion for a large number of properties where installing a conventional seepage pit is physically impossible, like Hawaii Island communities on lava fields. • Allows engineers greater design flexibility. • Advances the conversion mandate by making the most difficult to convert properties feasible.	• The advanced treatment unit will need to be under a Department-approved operation and maintenance contract and a responsible management entity may need to be put in place or in order to reduce risk of operational failure leading to primary effluent discharging to a pit with less robust lining.

	• Allowing for cesspool excavations and subsequent use without a concrete lining must be framed to ensure that this standard only applies to advanced secondary treated effluent, not for all new seepage pit construction.

ADDITIONAL INFORMATION

1. Advanced effluent quality equivalents:
   a. NSF40: BOD5 ≤ 25 mg/L, TSS ≤ 30 mg/L
   b. NSF245: BOD5 ≤ 25 mg/L, TSS ≤ 30 mg/L, TKN reduced by 50%
2. Current HAR 11-62-34(d)(3)(A) requires seepage pits to have 'a sidewall lining constructed of durable material that will permit free passage of wastewater without excessive plugging while still excluding the entry of surrounding soil.' HAR 11-62-34(d)(3)(B) requires a cover extending at least 12 inches beyond the excavation, unless a concrete ring is used. These requirements reflect a conventional seepage pit construction context.
3. An existing cesspool excavation is already an in-ground structure with established walls; the structural integrity concern that requires a lining is addressed through the engineer's structural certification. The Sato Pit Liner is an example of an alternative, modular liner approach that retains structural integrity and can be fit into excavated cesspools that vary in dimensions.
4. This rule change may also require an adjustment in percolation rates to reflect the reduced BOD in secondary treated effluent which should contribute to significantly slower biomat growth than primary treated effluent.

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Recommendation & SWOT Form 17

RECOMMENDATION SUMMARY
Create new pathways for decentralized cluster systems: Create a new subchapter within HAR 11-62 establishing clear, standardized pathways for permitting decentralized cluster and community-scale wastewater systems. Decentralized systems can serve two or more residences with design flows greater than 1,000 gpd and not exceeding 200,000 gpd to enable groups of rural properties to share a single advanced treatment system rather than each bearing the full cost and space requirements of individual conversions. This opens possibilities for effluent reuse for irrigation of firebreaks, greenbelts, and restoration plantings wherever feasible, and it also creates a structure that would allow for the development of responsible management entities (RMEs) or sewer improvement districts (SID) that are able to manage and maintain localized systems.

INTERNAL FACTORS

STRENGTHS +	WEAKNESSES –
• Reduces per-household conversion cost. • Enables cesspool conversion where individual lot size or geology make IWS infeasible. • Treated water can be redirected for community benefits like fire suppression, water storage, native plant restoration, agroforestry.	• Requires coordination among multiple landowners, which can be complex. • Needs a clearly defined Sewer Improvement District, Responsible Management Entity, or community nonprofit structure to manage operations and maintenance. • Regulatory framework for shared systems is currently absent from HAR 11-62, making this a larger scale revision.

EXTERNAL FACTORS

OPPORTUNITIES +	THREATS –
• Creates pathways for community-led water and wastewater management consistent with traditional Hawaiian approaches to resource stewardship. • Treated effluent directed to firebreaks and native vegetation corridors could serve watershed restoration and wildfire resilience simultaneously.	• Liability allocation between co-owners and the management entity can be legally complex. • The system must be able to adapt to changing community needs. • Long-term sustainability of community Sewer Improvement District or Responsible Management Entity structures requires dedicated funding mechanisms.

• Supports Department of Hawaiian Homelands communities and rural subdivisions where individual conversions are difficult or expensive.	

ADDITIONAL INFORMATION

1. Design flow tiers could include these ranges:
    a. Below 1,000 gpd: existing IWS framework applies
    b. Between 1,001-200,000 gpd: new decentralized cluster system category
    c. Above 200,000 gpd: existing treatment works framework applies
2. Texas TCEQ Chapter 217 provides a model for decentralized cluster system requirements.
3. EPA's Five Management Models for decentralized wastewater management provide a tiered framework that can be mapped to community-scale systems.
4. DHHL and rural Hawaiian communities should be prioritized as pilot sites (i.e., Ma'alaea on Maui or Hōnaunau on Hawai'i Island).

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Recommendation & SWOT Form

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RECOMMENDATION SUMMARY

Create a new professional license class for "IWS Designer" to eliminate the requirement for IWS to be designed solely by civil engineers

INTERNAL FACTORS

STRENGTHS +	WEAKNESSES –
Would further the department's cesspool conversion goals by increasing the number of licensed IWS designers	May result in increased review efforts by DOH staff in dealing with non-engineer generated IWS applications and drawings

EXTERNAL FACTORS

OPPORTUNITIES +	THREATS –
Would allow for more designers in the industry and reduce costs for homeowners wanting to convert cesspools or build new IWS	Could create more "design/build" IWS installers with conflicting interests and reduce third party oversight

ADDITIONAL INFORMATION

IWS design requires minimal engineering skill/judgment. The main technical skill in IWS design is performing the percolation test, which is easily completed by a non-engineer with some basic technical training. All other elements of IWS design are prescriptive and do not require difficult mathematical or empirical evaluation of design alternatives. The main requirement of the IWS designer is their ethical performance of the work and being held accountable for falsified test results or application materials, which a civil engineering license does not necessarily ensure in the first place.

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Recommendation & SWOT Form

RECOMMENDATION SUMMARY

Incentivize Advanced Treatment With Disposal Area Sizing Credits

Purpose: Current disposal sizing rules provide no credit for improved effluent quality of NSF 245 systems or equivalents, a missed opportunity to incentivize voluntary installation of higher-performing treatment systems that cost more and currently receive no design benefit

Outcome: Systems meeting defined nitrogen removal thresholds would qualify for reduced drain field area requirements, lowering installation costs and making conversion feasible on lots where current sizing rules are prohibitive.

INTERNAL FACTORS

STRENGTHS +	WEAKNESSES –
• Directly addresses the most common conversion barrier (lot size and disposal area constraints) by reducing required footprint for higher-performing systems.	• Requires DOH to define and maintain performance thresholds, adding administrative complexity to the approval process.
• Creates a clear regulatory incentive aligned with environmental protection goals, rewarding better treatment rather than treating all effluent quality equally.	• Credit levels must be calibrated carefully; overly generous credits could result in undersized disposal fields if treatment performance degrades.
• Reduced excavation and site work from smaller drain fields lowers total installation cost, partially offsetting the higher equipment cost of advanced systems.	• Depends on a monitoring and verification framework that does not yet exist statewide, creating an implementation prerequisite.

EXTERNAL FACTORS

OPPORTUNITIES +	THREATS –
• More advanced treatment systems installed statewide, producing higher quality effluent and reducing nitrogen loading to groundwater and nearshore waters.	• Engineers and regulators accustomed to conservative sizing standards may resist changes they perceive as reducing safety margins.
• Expands the pool of convertible parcels, accelerating progress toward the 2050 cesspool conversion mandate.	• Manufacturers of conventional systems may oppose a framework that advantages advanced treatment competitors.
• Aligns Hawaii's regulatory approach with jurisdictions like Suffolk County that have successfully tied disposal requirements to treatment performance.	• If early installations underperform due to inadequate O&M, the credit program could face political backlash and reversal.

ADDITIONAL INFORMATION

ATUs achieve 53-71% nitrogen removal with nitrification, up to 98% with enhanced configurations, outperforming conventional septic systems [1][4]. Nitrogen loading via groundwater transport to nearshore waters is a primary concern across all islands [2], validated by nearshore algal sampling [7]. Suffolk County I/A OWTS field-tested systems achieve TN < 10 mg/L [5]. Current disposal sizing provides no publicly stated credit for improved effluent quality, limiting incentive to adopt advanced treatment [1].

[1] Carollo Engineers. (2021). Cesspool Conversion Technologies Research Summary Report. Hawaii DOH CCWG.
[2] Shuler, C.K., et al. (2022). Hawaii Cesspool Hazard Assessment & Prioritization Tool: 2022 Update. WRRC-SR-2022-02.
[4] Babcock, R.W., et al. (2019). Investigation of Cesspool Upgrade Alternatives in Upcountry Maui. Hawaii DOH.
[5] Suffolk County DOHS. (2016-present). Article 19: I/A OWTS Program. Suffolk County Sanitary Code.
[7] Smith, C.M., et al. (2021). State-Wide Assessment of Wastewater Pollution Intrusion Into Coastal Regions of the Hawaiian Islands.

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Recommendation & SWOT Form

RECOMMENDATION SUMMARY

Reevaluate & Update Design Flow Assumptions

Purpose: Current regulations usually assume 1,000 gallons per day (200 gpd/bedroom) for system design. This predates modern low-flow fixtures and exceeds measured residential water use by a wide margin. The resulting oversized systems increase cost and land area requirements unnecessarily.

Outcome: Updated flow assumptions reflecting modern fixture standards would reduce required system size, lowering both cost and land area requirements for every cesspool conversion.

INTERNAL FACTORS

STRENGTHS +	WEAKNESSES –
• Directly reduces system cost and footprint for every conversion, not just those using advanced treatment. • Supported by extensive measured data: EPA studies report average per capita indoor use of 50-71 gpd, well below the 200 gpd/bedroom design assumption [3]. • Multiple states have already made this adjustment. New York uses 110 gpd/bedroom for modern fixtures, providing a tested precedent [8].	• Requires formal rulemaking and public comment, adding timeline before benefits are realized. • A single statewide number may not account for variability in household water use patterns across different housing types and occupancy scenarios. • Could be perceived as reducing safety margins, even though the current assumption substantially exceeds actual measured use.

EXTERNAL FACTORS

OPPORTUNITIES +	THREATS –
• Lower design flows reduce material, excavation, and land requirements across all system types, improving conversion costs/economics statewide. • A tiered approach (lower flows for verified modern fixtures, standard flows for older homes) could capture savings while managing risk and provide additional water saving incentives. • Brings Hawaii into alignment with current national practice, removing an outdated assumption.	• Conservative regulators and practitioners may oppose changes on precautionary grounds regardless of supporting data. • If Hawaii residential water use patterns differ from mainland averages due to climate or household composition, mainland benchmarks could be challenged. • Any system failure attributed to reduced sizing, even if unrelated, could generate public and political pressure to revert.

ADDITIONAL INFORMATION

System sizing and cost are highly sensitive to assumed wastewater flow [1]. NYS now uses 110 gpd/bedroom for modern fixtures, reduced from 150 gpd for pre-1980 homes; many states use 110-150 gpd/bedroom [3][8]. EPA studies report average per capita indoor use of 50-71 gpd, well below many design assumptions [3].

[1] Carollo Engineers. (2021). Cesspool Conversion Technologies Research Summary Report. Hawaii DOH CCWG.
[3] U.S. EPA. (2002). Onsite Wastewater Treatment Systems Manual. EPA/625/R-00/008.
[8] NYS DOH. (2024). Residential OWTS Design Handbook, Appendix 75-A.

Recommendation & SWOT Form

RECOMMENDATION SUMMARY
Clarify and Reconsider Reserve Area Requirements for Advanced Treatment **Purpose:** Current rules require 100% backup disposal capacity at peak flow, effectively doubling the land area needed for any onsite system. On small lots, this single requirement renders conversion physically impossible regardless of treatment technology. **Outcome:** Conditional reductions in reserve area requirements, tied to verified advanced treatment performance, would make thousands of currently infeasible lots convertible while maintaining environmental protection and providing new incentive to install more effective treatment systems.

INTERNAL FACTORS

STRENGTHS +	WEAKNESSES –
• Targets the single largest land-use barrier to conversion on constrained lots. • Conditional reductions (not elimination) maintain a protective framework while reducing the most burdensome requirement. • Directly reduces the number of parcels requiring Act 125 exemptions, improving overall conversion rates and streamlining approval process.	• Reduced reserve areas limit remediation options if the primary system fails, particularly on small lots where alternatives are already constrained. • Defining acceptable conditions for reduced reserves requires performance data from Hawaii installations that may be limited for newer technologies. • Adds a different kind of complexity to permitting decisions by introducing conditional requirements rather than a single uniform standard.

EXTERNAL FACTORS

OPPORTUNITIES +	THREATS –
• The HCPT identifies thousands of likely spatially constrained parcels in priority areas [2]; this change could unlock a large share for conversion. • Encourages adoption of advanced treatment by pairing it with a tangible design benefit beyond effluent quality. • Could be structured as a **pilot program in high conversion priority areas** before statewide adoption, managing risk incrementally (true for most of these recommendations)	• If advanced treatment fails and no reserve area exists, property owners and DOH face limited and expensive remediation options. • Could be characterized by opponents as weakening environmental protections, even if the net environmental effect is positive through increased conversions. • Liability exposure for DOH if approved reduced reserves are later proven to be direct cause of system failures with significant economic or environmental impacts.

ADDITIONAL INFORMATION

Current rules require full backup disposal capacity at peak flow [1]. Lot size and site constraints are the most commonly cited barriers to conversion feasibility [1]. Act 125 (SLH 2017) recognizes small lot size as a legitimate basis for exemption from the conversion mandate [6]. The HCPT identifies thousands of constrained parcels in priority areas [2].

[1] Carollo Engineers. (2021). Cesspool Conversion Technologies Research Summary Report. Hawaii DOH CCWG.
[2] Shuler, C.K., et al. (2022). Hawaii Cesspool Hazard Assessment & Prioritization Tool: 2022 Update. WRRC-SR-2022-02.
[6] Hawaii Session Laws: Act 125 (2017); Act 132 (2018); Act 217 (2024).

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Recommendation & SWOT Form

RECOMMENDATION SUMMARY

Standardize Disposal Sizing Adjustments for Approved Technologies

Purpose: No published guidance currently standardizes the relationship between treatment performance and required disposal area. Engineers lack predictable design parameters, and permitting outcomes vary depending on the reviewer. This uncertainty discourages adoption of higher-performing systems.

Outcome: Published sizing adjustment factors for specific technologies correlating treatment level to disposal area would give engineers predictable design parameters and reduce permitting uncertainty.

INTERNAL FACTORS

STRENGTHS +	WEAKNESSES –
• Replaces case-by-case sizing decisions with published, transparent criteria that apply consistently across applications. • Reduces permitting time, engineering costs and uncertainty of approvals, and soft costs by eliminating the need for individual justification and approval of sizing adjustments. • Creates a predictable technical foundation for the disposal sizing credits in Recommendation 1.	• Developing Hawaii-specific factors may require a state testing facility. • Standardized tables may not fully capture site-specific variability in soil and groundwater conditions across the islands. • Published factors require periodic review and updating, adding an ongoing administrative responsibility and need for a testing facility.

EXTERNAL FACTORS

OPPORTUNITIES +	THREATS –
• Predictable sizing parameters encourage more engineers to design with advanced treatment systems. • New York State and Suffolk County provide tested models for technology-specific sizing tables that could be adapted or adopted [3][8]. There are opportunities to align our regulation with other states. • Standardized adjustments support a more competitive market for onsite treatment technologies in Hawaii.	• Published factors could become outdated if not maintained, creating liability if conditions change. • Manufacturers of technologies not included in initial tables may face market disadvantage until their systems are evaluated. • Over-reliance on generic factors when site conditions warrant deviation could lead to under- or over-designed systems.

ADDITIONAL INFORMATION

Disposal technologies vary in space requirements and performance, but no published guidance standardizes treatment-level adjustments [1]. NYS and other jurisdictions publish technology-specific sizing tables [3][8]. Lack of standardization creates permitting uncertainty and discourages adoption of higher-performing systems [1].

[1] Carollo Engineers. (2021). Cesspool Conversion Technologies Research Summary Report. Hawaii DOH CCWG.
[3] U.S. EPA. (2002). Onsite Wastewater Treatment Systems Manual. EPA/625/R-00/008.
[8] NYS DOH. (2024). Residential OWTS Design Handbook, Appendix 75-A.

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Recommendation & SWOT Form

RECOMMENDATION SUMMARY

Maintain a Public-Facing Approved Systems List

Purpose: No comprehensive, maintained list of approved onsite treatment technologies currently exists in Hawaii. Approvals are handled case-by-case, adding time to review process and limiting transparency for homeowners, engineers, and installers evaluating conversion options.

Outcome: A regularly updated, publicly accessible list of approved technologies with performance specifications would improve market transparency and reduce per-application review burden on DOH.

INTERNAL FACTORS

STRENGTHS +	WEAKNESSES –
• Reduces information barriers for homeowners facing conversion mandates who currently have limited visibility into available options. • Shifts DOH staff effort from repetitive per-application technology review to upfront technology evaluation, improving efficiency. • Provides a structured framework for communicating approval status and performance expectations.	• Requires dedicated staff time and a defined process for adding, updating, and removing entries. • A published list may be misinterpreted as DOH endorsement of specific products rather than documentation of approval status. • Initial list development requires significant effort to catalog and verify currently approved technologies.

EXTERNAL FACTORS

OPPORTUNITIES +	THREATS –
• Increased market transparency attracts more technology providers to Hawaii, expanding the range of available conversion options. • Homeowners and engineers can make more informed decisions, potentially improving system selection and long-term performance. • Creates a visible benchmark for the staged approval pathway proposed in Recommendation 8.	• Political or manufacturer pressure to include or exclude specific technologies. • Technologies on the list may underperform in field conditions compared to test or laboratory results, creating accountability questions. • If the list is not regularly updated, outdated entries could mislead users and erode confidence in the program.

ADDITIONAL INFORMATION

No comprehensive maintained list of approved technologies currently exists; approvals are case-by-case [1]. Suffolk County and Massachusetts DEP maintain public approved technology lists with field-verified performance data [3][5]. Limited transparency slows market development and reduces predictability for homeowners and engineers [1].

[1] Carollo Engineers. (2021). Cesspool Conversion Technologies Research Summary Report. Hawaii DOH CCWG.

[3] U.S. EPA. (2002). Onsite Wastewater Treatment Systems Manual. EPA/625/R-00/008.

[5] Suffolk County DOHS. (2016-present). Article 19: I/A OWTS Program. Suffolk County Sanitary Code.

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Recommendation & SWOT Form

RECOMMENDATION SUMMARY
Align Treatment Requirements with Priority and Sensitivity Areas **Purpose:** Current Hawai'i wastewater rules establish statewide baseline standards, but they do not explicitly tier treatment requirements according to HCPT Priority. As a result, treatment requirements are not fully and explicitly aligned with documented differences in hazard and environmental sensitivity across the state. **Outcome:** Explicit requirements for higher-performing systems in Priority 1 areas and near sensitive receptors would target regulatory effort and treatment costs where environmental risk is greatest.

INTERNAL FACTORS

STRENGTHS +	WEAKNESSES –
• Concentrates the most protective treatment requirements where evidence supports them, improving cost-effectiveness of the overall program. • Aligns HAR11-62 regulatory structure with the risk-based framework already established by the HCPT and Acts 132 and 217. • Potentially allows less restrictive treatment standards in lower-risk areas, improving conversion feasibility where environmental sensitivity is lower.	• Tiered requirements add complexity to permitting compared to a single uniform standard. • Defining boundaries between sensitivity tiers requires ongoing scientific input and may be contested by affected property owners. • Higher treatment requirements in priority areas may increase per-unit conversion costs for properties in those zones if other recommendations here are not also implemented to offset them.

EXTERNAL FACTORS

OPPORTUNITIES +	THREATS –
• Reduced nitrogen and pathogen loading in the most environmentally sensitive areas, with measurable water quality improvements over time. • Establishes a science-based precedent for spatially differentiated environmental regulation in Hawaii. • Lower-tier areas benefit from reduced installation costs, which could accelerate voluntary conversions outside priority zones.	• Property owners in designated priority areas may perceive tiered requirements as inequitable and challenge classifications. • Boundary disputes and reclassification requests could create administrative burden and legal exposure. • If lower-tier areas subsequently show water quality impacts, the tiered approach could face criticism for being insufficiently protective.

ADDITIONAL INFORMATION

HCPT demonstrates significant spatial variability in risk across 15 factors [2]. Smith et al. (2021) validated wastewater-derived nitrogen in nearshore waters at priority locations [7]. Acts 132 and 217 direct identification of priority areas and preferred alternatives [6]. Uniform statewide standards do not reflect documented variability in hazard.

[2] Shuler, C.K., et al. (2022). Hawaii Cesspool Hazard Assessment & Prioritization Tool: 2022 Update. WRRC-SR-2022-02.
[6] Hawaii Session Laws: Act 125 (2017); Act 132 (2018); Act 217 (2024).
[7] Smith, C.M., et al. (2021). State-Wide Assessment of Wastewater Pollution Intrusion Into Coastal Regions of the Hawaiian Islands.

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Recommendation & SWOT Form

RECOMMENDATION SUMMARY
Incorporate Clustered/Decentralized Systems as a Defined Pathway **Purpose:** The current regulatory framework does not clearly define permitting, design, or management standards for cluster (community-scale) onsite treatment systems. This leaves a viable conversion approach without a predictable regulatory pathway, despite legislative direction under Act 132 to evaluate decentralized approaches. **Outcome:** Clear provisions for cluster system permitting, O&M requirements, and responsible management entity (RME) standards would enable community-scale conversions where individual lot constraints or other factors prevent parcel-by-parcel replacement.

INTERNAL FACTORS

STRENGTHS +	WEAKNESSES –
• Addresses areas where individual lot cesspool conversion is physically or economically infeasible by enabling shared infrastructure. • Professional management through an RME improves long-term O&M compliance compared to individual homeowner-managed systems. • Hawaii has a proof of concept: the Puako pilot demonstrated community-scale MBR producing R-1 quality recycled water [9].	• Cluster systems require institutional infrastructure (RME formation, easements, cost-sharing agreements) that adds complexity beyond engineering design. • Community buy-in and participation are required; non-participation by key parcels can undermine project viability. May require formation of a HOA. • Higher upfront planning and permitting costs compared to individual system installations.

EXTERNAL FACTORS

OPPORTUNITIES +	THREATS –
• R-1 quality effluent from cluster MBR systems creates reuse opportunities, particularly in water-scarce areas of West Hawaii and Maui. • Cluster systems broaden eligibility for federal and state funding programs that favor community-scale infrastructure. • Successful cluster projects could serve as models for other cesspool-dense communities statewide.	• Failure of the RME (financial or operational) could leave participating properties without wastewater service. • Securing easements and rights-of-way for collection infrastructure on private land can face legal and community resistance. • Opposition from property owners who prefer individual system control and perceived lower costs over shared infrastructure dependence and financial obligation.

ADDITIONAL INFORMATION

Cluster systems are viable for high-density areas and improve O&M reliability [1]. The Puako pilot (Hawaii Island) demonstrated feasibility for community-scale MBR producing R-1 recycled water [9]. Act 132 directs evaluation of decentralized approaches; CCWG found cluster systems offer rapid conversions and broadened funding [6][10].

[1] Carollo Engineers. (2021). Cesspool Conversion Technologies Research Summary Report. Hawaii DOH CCWG.
[6] Hawaii Session Laws: Act 125 (2017); Act 132 (2018); Act 217 (2024).
[9] Fukunaga & Associates / WRRC. (2024). Puako Decentralized Wastewater System: Basis of Design. EPA EFC.
[10] Hawaii DOH CCWG. (2023). Final Report to the 2023 Legislature.

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Recommendation & SWOT Form

RECOMMENDATION SUMMARY

Develop Structured Approval Pathways for Innovative Technologies

Purpose: Hawaii lacks defined procedures for evaluating innovative onsite treatment technologies. Without a structured path from pilot testing to general approval, technology providers face unpredictable timelines and requirements that discourage market entry. The CCWG recommended streamlining these approvals.

Outcome: A testing center coupled with a formal staged approval process (pilot, provisional, general use) with defined performance criteria and monitoring at each stage would manage risk while providing a predictable pathway for new technologies.

INTERNAL FACTORS

STRENGTHS +	WEAKNESSES –
• Provides a transparent, predictable process that technology providers can plan around, reducing market entry barriers. • Staged approach manages risk incrementally: technologies prove performance at each stage before advancing. • Creates a systematic evidence base that feeds into the approved systems list and other incentives (Recommendations 5,4)	• Requires significant upfront effort to establish testing center, define criteria, develop monitoring protocols, and review procedures for each stage. • Hawaii's smaller market may attract fewer technology applicants than larger mainland jurisdictions, potentially limiting impact. • Monitoring performance through pilot and provisional stages requires staff capacity and laboratory resources.

EXTERNAL FACTORS

OPPORTUNITIES +	THREATS –
• Attracts technology providers who currently bypass Hawaii due to approval uncertainty, expanding available conversion options. • Suffolk County's Article 19 framework (active since 2016) provides a tested model that could be adapted rather than built from scratch [5]. • Builds a Hawaii-specific performance dataset that improves the basis for future regulatory decisions.	• Political pressure to fast-track favored technologies, undermining the staged framework's integrity. • Technologies approved at provisional stage may underperform when deployed at scale or in different site conditions across the islands. • Administrative costs of maintaining the staged review program may strain DOH resources if not adequately funded.

ADDITIONAL INFORMATION

Hawaii lacks defined procedures for evaluating innovative technologies [1]; CCWG recommended streamlining approvals [10]. Suffolk County's Article 19 staged framework has approved multiple nitrogen-reducing systems since 2016 [5]. Massachusetts and Rhode Island use similar tiered systems [3].

[1] Carollo Engineers. (2021). Cesspool Conversion Technologies Research Summary Report. Hawaii DOH CCWG.
[3] U.S. EPA. (2002). Onsite Wastewater Treatment Systems Manual. EPA/625/R-00/008.
[5] Suffolk County DOHS. (2016-present). Article 19: I/A OWTS Program. Suffolk County Sanitary Code.
[10] Hawaii DOH CCWG. (2023). Final Report to the 2023 Legislature.

Recommendation & SWOT Form

RECOMMENDATION SUMMARY

Create Expedited Permitting for Pre-Approved High-Performing Systems

Purpose: Each conversion application currently requires individual technology review regardless of whether the proposed system has an established performance record. This adds time and cost to every project and consumes DOH staff capacity on repetitive reviews. NSF/ANSI Standards 40 and 245 provide nationally recognized benchmarks that could streamline this process.

Outcome: Systems completing staged approval (Rec. 8) with NSF/ANSI 40 and 245 certification would qualify for expedited permitting. Reciprocity with rigorous state programs (e.g., Suffolk County, Massachusetts) would further expand the pre-approved pool.

INTERNAL FACTORS

STRENGTHS +	WEAKNESSES –
• Reduces per-application review time and soft costs for homeowners, directly improving conversion economics. • Frees DOH staff from routine reviews, redirecting capacity to complex or non-standard applications. • Builds on nationally recognized certification standards (NSF/ANSI 40 and 245) rather than creating a Hawaii-specific evaluation from scratch.	• Reciprocity assumes systems validated in other jurisdictions will perform comparably in Hawaii's soils, climate, and geological conditions. • Expedited permitting reduces individual application scrutiny, which may miss site-specific constraints that full review would catch. • NSF/ANSI certification addresses treatment performance but not disposal or siting conditions specific to Hawaii.

EXTERNAL FACTORS

OPPORTUNITIES +	THREATS –
• Significantly faster permitting timelines could accelerate conversion rates, particularly in priority areas. • Reciprocity with Suffolk County and Massachusetts programs expands available technologies without duplicating evaluation effort. • Over 5,000 systems installed under Suffolk County's pre-approved list framework demonstrate scalability [5].	• Systems performing well in controlled certification testing may underperform under actual residential use conditions. • Manufacturers of systems not yet certified may perceive expedited permitting as creating an unfair competitive barrier. • Expedited review could be characterized as reduced oversight, raising public confidence concerns about system quality.

ADDITIONAL INFORMATION

DOH recommends simplifying approval processes to accelerate conversions [1]. Multiple states use pre-approved system lists to reduce per-application review [3][5]. NSF/ANSI 40 and 245 provide nationally recognized performance benchmarks [3]. Suffolk County has installed >5,000 systems using its pre-approved list framework [5].

[1] Carollo Engineers. (2021). Cesspool Conversion Technologies Research Summary Report. Hawaii DOH CCWG.
[3] U.S. EPA. (2002). Onsite Wastewater Treatment Systems Manual. EPA/625/R-00/008.
[5] Suffolk County DOHS. (2016-present). Article 19: I/A OWTS Program. Suffolk County Sanitary Code.