



WAI WASTEWATER
ALTERNATIVES &
INNOVATIONS

Hawai'i's Cesspool Challenge and Solutions

Presented by:
Stuart Coleman, Ex. Dir. Of WAI
Jim King, Eljen Corporation

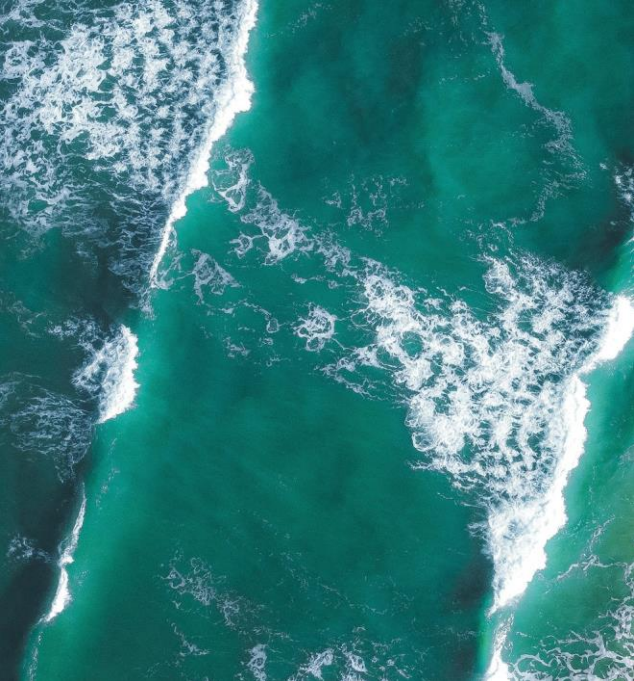
eljen
CORPORATION

Innovative Onsite Products and Solutions Since 1970

NOWRA, October 2023

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WAI WASTEWATER
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Mission: WAI works to protect water quality, reduce sewage pollution and restore healthy watersheds by providing innovative, affordable and eco-friendly solutions to waste and wastewater management for all people.

Vision: Help Hawai'i homeowners and communities manage the difficult process of upgrading cesspools and failing septic systems across the state to new systems that are affordable, efficient and better for the environment.



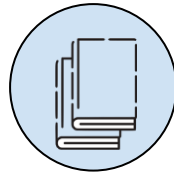
**Innovative
Technology**



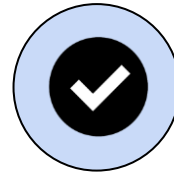
**Financial
Resources**



**Policy &
Advocacy**



**Outreach &
Education**



**Pilot
Projects**

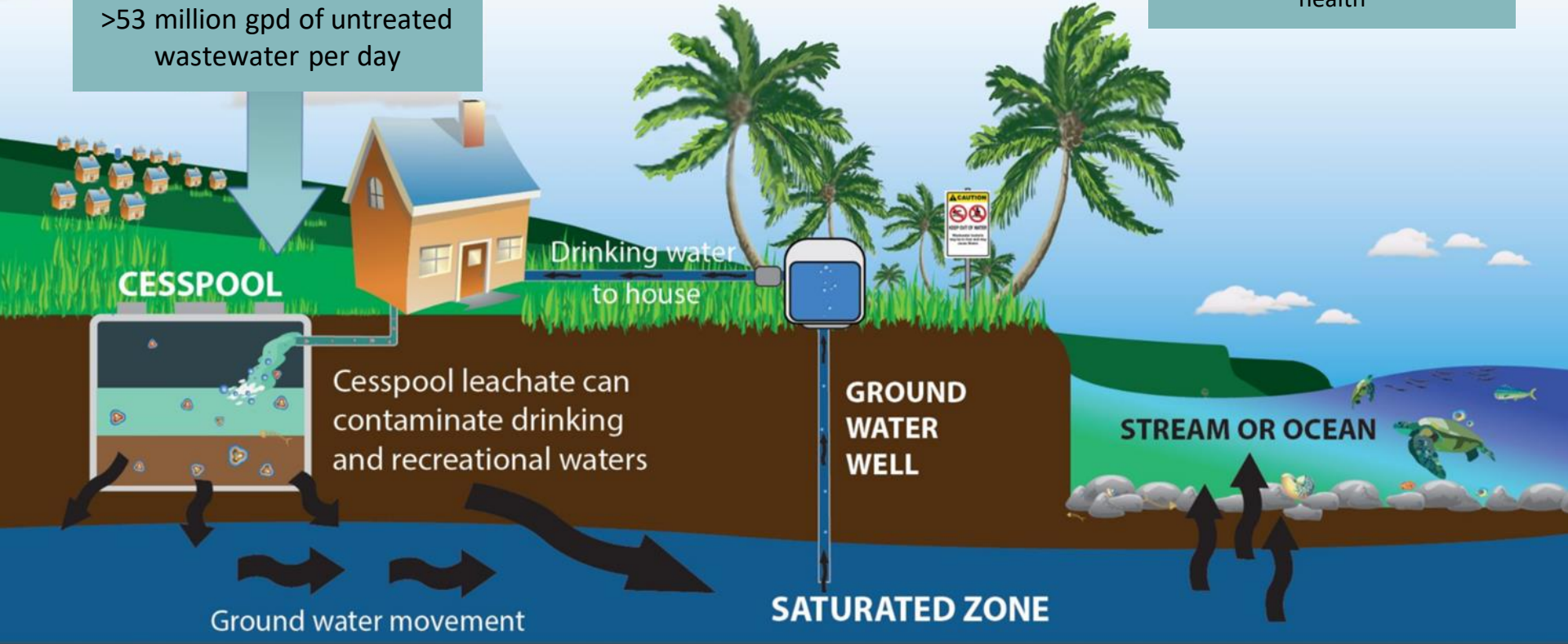
An aerial photograph of a rugged coastline. The land is covered in lush green vegetation, with steep, eroded hillsides leading down to a narrow, crescent-shaped beach. The ocean is a vibrant blue, with white waves crashing against the shore. The sky is filled with large, white clouds, and the overall scene is one of natural beauty and dramatic landscape.

THE CESSPOOL PROBLEM IN HAWAII

PROBLEM:

83,000 cesspools discharge
>53 million gpd of untreated
wastewater per day

Pollutants and nutrients enter
water bodies, causing hazards
to public and environmental
health



CHALLENGE: Environmental & Public Health Hazards

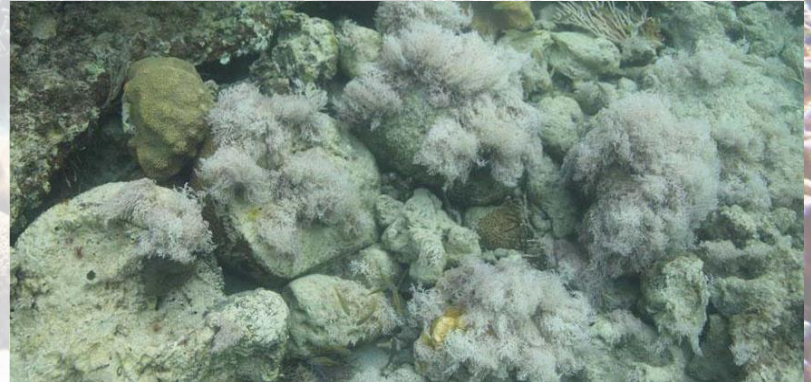


Public health hazards

- Drinking water pollution → risk of nitrate-related diseases
- Pathogens in recreational waters → risk of infections and other diseases

Environmental hazards

- Nutrient pollution → invasive algae overgrowth
- Sewage pollution → coral disease



Wastewater pollution causes harm to coral reefs and native marine ecology

New Research by Dr. Greg Asner

Gove et al. 2023 *Nature*

- Wastewater pollution and herbivore management are the most important factors in West Hawaii reef resilience



Photo: R. Sparks, Division of Aquatic Resources

Donà et al., 2023, *Nature Scientific Reports*

- Invasive algae outcompete native *limu* in wastewater-polluted groundwater conditions



Photo: University of Hawaii

CHALLENGE: Human health & cultural activities



o Swimmers, surfers, fishers, and paddlers report illnesses and infections from swimming in polluted waters from all over the islands

- o Subsistence fishing and gathering of marine foods can be negatively impacted by wastewater
- o Health of loko i'a - fish ponds (aquaculture)
- o Clean water for paddling, surfing, keiki to swim



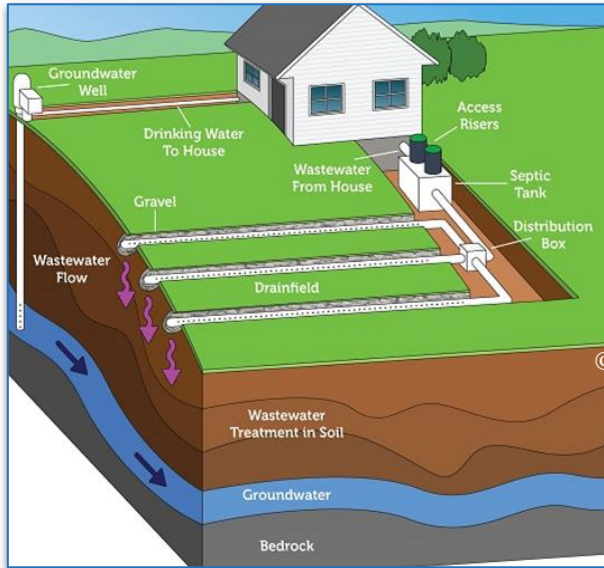
CHALLENGE: Cesspool Conversion Rates

- Mandate goal is 83,000 by 2050
- Currently 200-300 conversions per year
- Increase to 3,000 to reach mandate goal - **WORKFORCE**
- Costs \$30,000 - \$50,000 per home, estimated total cost ~\$3-4 billion - **FINANCING**



Options for Conversion – Individual Wastewater Systems (IWS)

Not recommended: Septic System



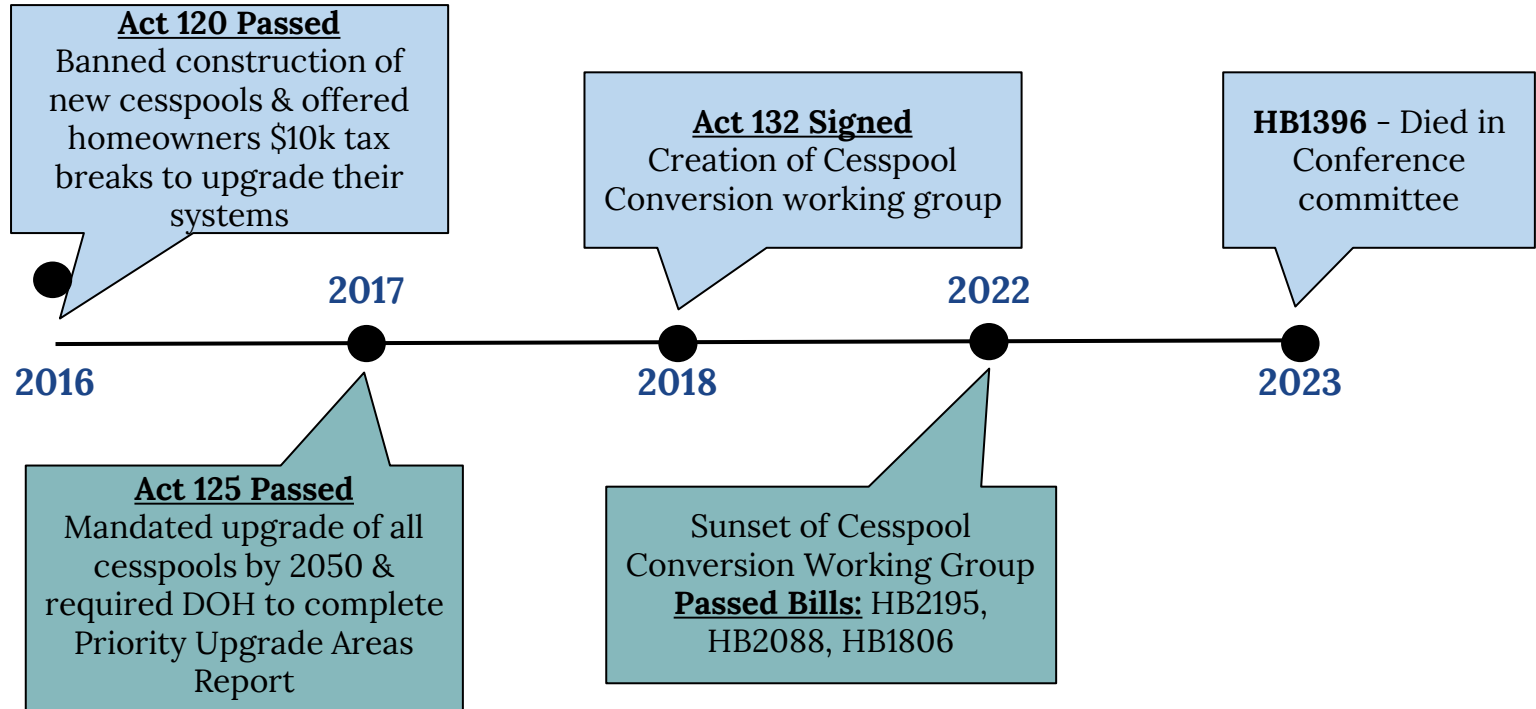
Traditional Septic systems

- Minimal treatment
- Nutrients, pathogens, and chemicals of emerging concern (CECs) can leach out to pollute water resources if soil is not ideal
- Porous sand and volcanic rock allow rapid transit of polluted effluent

Innovative Options to Reduce Pollution

- NSF 245 systems that do Denitrification
 - Passive systems like Eljen
 - ATU's like Fuji Clean
- Better quality effluent can allow reduced leach field size = cost savings
- Water reuse

Progress Legislation & Financial Assistance



Policy and Advocacy – Bills Passed in 2022

HB2195 pilot program providing reimbursable \$20k grants for low- and moderate-income homeowners to help with cesspool conversion (*application period already passed*)

HB1806 permitting for new technology cesspool replacement, beyond septic systems and Aerobic Treatment Units

HB2088 Commercial property owners can finance qualifying improvements (including Large Capacity Cesspools) through property assessment



Vision for a new Wastewater Paradigm



WAI's Technology Partners

WAI is committed to finding the best sanitation solutions to protect water quality & help restore Hawaii's watersheds & natural resources.

We value:

- Innovative technologies
- Reuse of resources
- Mission-driven ethos
- Commitment to help solve Hawaii's wastewater issues
- Pro-bono & low-bono donations of equipment & services for pilot projects
- Workforce development
- Support of WAI's Mission



Eljen Corporation - Introduction

- Established in 1970, veteran-managed
- Geotextile Sand Filter leach field system approved for use in Hawaii
 - NSF 40 - 2022
 - NSF 245 - 2023
- Working with WAI since 2020
- Donated all engineering, construction and materials and to a local vet in Hawaii Paradise Park



Eljen is a global leader in providing innovative products and solutions for protecting our environment and public health.

Eljen Corporation Applicability to Hawai‘i

Cleaner effluent = lower pollution impact

NSF40 and NSF245 options provide higher treatment than a standard septic system

Reduction in required leach field size

More flexibility for installation in small lots, lower cost

Proven technology

Worry-free functionality for homeowners;
High confidence for regulatory agencies

Affordable

Simple installation, low maintenance costs



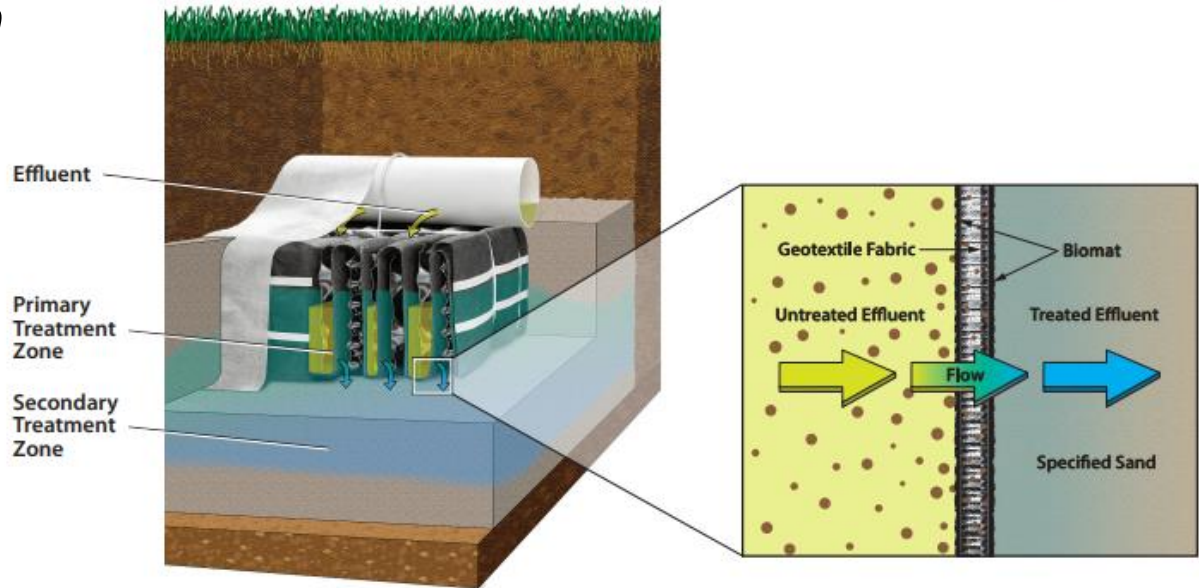
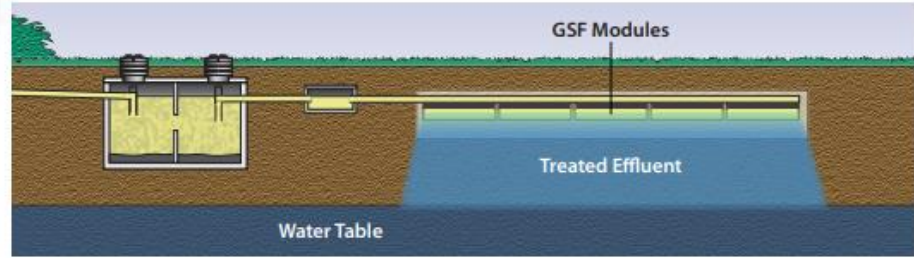
Industry opportunity:

C33 ASTM Sand needed for thousands of installations

Eljen Corporation

Geotextile Sand Filter Leach Field System

GSF SYSTEM OPERATION





Let's solve this together.

<https://waicleanwater.org/>