

WASTEWATER ALTERNATIVES & INNOVATIONS

2021

# ANNUAL REPORT



**WAI** WASTEWATER  
ALTERNATIVES &  
INNOVATIONS

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# ABOUT WASTEWATER ALTERNATIVES & INNOVATIONS



## 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

WAI helps 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.

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# LETTER FROM THE EXECUTIVE DIRECTOR

A wise politician once said, Never waste a crisis. Although the ongoing COVID pandemic caused many health and economic hardships here in Hawai'i and across the globe, we at WAI decided to transform the crisis into an opportunity for workforce development. To convert 88,000 cesspools by 2050, we knew Hawai'i would need to expand its workforce dramatically.

As part of our Work-4-Water Initiative, we collaborated with our partners to create the blueprint for a jobs training program in the wastewater sector. These green jobs will help diversify our economy and reduce the health and environmental risks posed by so many cesspools.

We held our 2nd Annual Innovations in Sanitation Convening in mid-August, fulfilling our commitment to bring the most efficient, eco-friendly and affordable sanitation technologies to Hawai'i. Working with our tech partners, we helped introduce five new treatment systems to scores of key stakeholders and about 60 more online attendees.

WAI collaborated with our tech partner Cinderella from Norway and won a Kauai Innovation Grant to pair Cinderella's waterless incinerating toilets with a new greywater recycling system that will be the first of its kind in the U.S. Partnering with another non-profit from Maryland called Ridge to Reefs, we also won a USDA Technical Assistance & Training to introduce a nature-based wastewater treatment system called a Bioreactor Garden.

In recognition of our accomplishments, WAI was invited to join a national group called the Decentralized Wastewater Innovation Cohort (DWIC) with four other organizations across the country. WAI was also invited to be a founding member of an international organization called the Ocean Sewage Alliance. We are focused on Hawai'i, but we are working with partners around the world to address this issue.

Over the pandemic, our talented team at WAI stepped up and transformed the crisis into an opportunity for outreach and education. We hosted Town Hall meetings in the Priority Areas of Kahalu'u and Waimanalo; organized weekly meetings with community partners and legislators; published articles; presented at conferences; and even produced an impressive short film with our DWIC partners.

We couldn't have accomplished any of the above achievements without the generous support of our funders, donors, tech partners, Board of Directors, Advisory Board Members, and our hardworking team (the Poo Fighters;-). Mahalo to each of you who have supported WAI and helped us become a force for positive change in Hawai'i!

**STUART COLEMAN**  
WAI EXECUTIVE DIRECTOR



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# OUR FIVE PILLARS

## Innovative Technology

WAI is committed to introducing new sanitation technology to the state and finding the most efficient, affordable and eco-friendly solutions. In 2019 WAI successfully hosted its first Annual Innovations in Sanitation Convening with the Bill and Melinda Gates Foundation and we look forward to growing our reach through similar Convenings in the future.

## Financial Resources

WAI is seeking funding sources to help homeowners with the expensive process of converting their cesspools and failing septic systems. We are working with the Environmental Protection Agency (EPA), Hawai'i Department of Health (DOH), USDA's Rural Development Office, and private foundations to bring together federal, state, and philanthropic funding to help homeowners.

## Policy & Advocacy

WAI is working with a coalition of groups to pass legislation and update policies that will help convert the state's worst cesspools and reduce 53 million gallons of untreated sewage that are discharged into the state's waters each day.

## Community Outreach

WAI is committed to working with homeowners and community groups to learn more about their needs and share the environmental and health threats associated with cesspools and sewage pollution. We will continue holding community talks, public presentations, workshops, and convening to educate the public about wastewater pollution & regulations and get their buy-in on the benefits of converting their cesspools and failing septic systems.

## Pilot Projects

WAI is working with key stakeholders to create successful demonstration projects that can serve as models for the rest of the state. We are collaborating with community groups, wastewater companies, government agencies, researchers, wastewater engineers and contractors to design and implement cutting-edge pilot projects.

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# OUR TEAM

MEET THE PEOPLE THAT BRING OUR MISSION TO LIFE.



**STUART COLEMAN**  
EXECUTIVE DIRECTOR &  
CO-FOUNDER



**JOHN ANNER**  
MANAGING DIRECTOR &  
CO-FOUNDER



**CHIRSTINA COMFORT**  
PROGRAM MANAGER



**JOACHIM SCHNEIDER**  
PROJECT COORDINATOR



**JACKIE ORSA**  
OPERATIONS COORDINATOR

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# BOARD OF DIRECTORS

MEET THE PEOPLE THAT SUPPORT AND HELP DIRECT OUR ORGANIZATION.



**ROGER  
BABCOCK**



**MAHINA  
PAISHON  
DUARTE**



**STUART  
COLEMAN**



**JOHN  
ANNER**

# VOLUNTEERS

- EDDIE ADACHI
- SHELLY MASUDA
- ROBIN KNOX
- ARIANNA FEINBERG
- LEAN TEODORO
- GILLIAN DUNN
- NICOLAS VANDERZYL





# INNOVATIVE TECHNOLOGY

Beginning in 2019, WAI has worked to develop partnerships with **innovative wastewater** companies and works to introduce these technologies to Hawai'i. As of 2021, we have **six** partnerships

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## **FUJI CLEAN**

Fuji Clean manufactures top-of-the-line Aerobic Treatment units which treat wastewater to a high standard and removes pathogens and nutrients that would otherwise pollute the environment.

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## **CINDERELLA ECO GROUP**

The Cinderella Incineration Toilet is a waterless alternative toilet powered by electricity or propane. It produces only a small odorless, pathogen-free ash and avoids water pollution.

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## **RIDGE TO REEFS**

Ridge To Reefs Bioreactor Garden is a constructed wetland that uses a layer-cake model and plants microbial activity to denitrify wastewater. This is an example of a nature-based solution that reduces water pollution.

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## **ELJEN**

Eljen produces the Geotextile Sand Filter (GSF) that can be used in an enhanced sand filter. These GSFs remove nutrients and pollutants from wastewater after it exits a septic tank.

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# INNOVATIVE TECHNOLOGY

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## **CAMBRIAN**

Cambrian provides decentralized membrane bioreactor wastewater treatment. Their equipment can either be used with industrial strength or residential wastewater, and they can produce usable water for agricultural purposes.

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## **BIOMASS CONTROLS**

Biomass Controls has an exciting solution for wastewater sludge. By combining 51% wastewater sludge solids with 49% green waste such as invasive plant cuttings, Biomass Controls can produce biochar in a carbon-negative process. The resulting biochar could be used for stormwater filtration or as a soil amendment and will reduce the overall carbon footprint of wastewater treatment.

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## **WAI HOME**

WaiHome is a wastewater research and design firm based in Hawai'i. WAI helps WaiHome with outreach and permitting efforts regarding their first pilot unit of advanced passive wastewater treatment technology retrofits onto existing septic systems.

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# INNOVATIVE TECHNOLOGY: PILOT PROJECTS

WAI'S TECHNOLOGY PARTNERS WORK TO BRING SOME OF THE MOST INNOVATIVE SOLUTIONS FOR WASTEWATER TREATMENT. THESE SYSTEMS FUNCTION BETTER THAN SEPTIC SYSTEMS WHICH IS CURRENTLY THE MOST COMMON SYSTEM CONVERTED TO FROM CESSPOOLS.



WAI believes that the cesspool issue in Hawai'i is not a one-size fits all solution. Our technology partners bring unique and cutting-edge solutions to wastewater pollution that we believe each fill a gap in the wastewater treatment options currently offered to Hawai'i homeowners and communities. These technologies include nitrate-removing biofilters, incineration toilets, aerobic treatment technologies, and community-scale decentralized wastewater systems. In 2021, 3 pilot projects were completed.

- A first-of-its-kind Cinderella Incineration Toilet and greywater combination system for a Kaua'i resident.
- The installation of the donated Eljen Biofilter system to a Hawai'i Island resident.
- The Ridge to Reef Bioreactor Garden passed its pilot testing and is approved for use in leeward areas of the islands

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# FINANCIAL RESOURCES

## THE LACK OF FINANCIAL RESOURCES TO PAY FOR THE COST OF CESSPOOL CONVERSIONS IS THE GREATEST CHALLENGE.

Cesspool conversion to an updated OSDS can cost between \$30,000-\$50,000. Most homeowners do not have the ability to absorb this cost. WAI is looking at various strategies to help lessen the burden on homeowners.

**USDA Rural Development** loans are an existing resource for low-interest cesspool conversion loans, but eligibility limits are strict. WAI is therefore working to encourage more accessible grant and loan programs.

WAI's advocacy and testimony worked towards passing legislation that would assist low and moderate-income homeowners with the cost of cesspool conversions. These funds could become available as grants to homeowners or rebates to cesspool installers.

The **Clean Water State Revolving Fund** is another way to access funds for decentralized wastewater projects such as cesspool conversions. Most CWSRF projects focus on municipal, centralized wastewater systems, but mechanisms exist to fund decentralized improvements as well. Various counties (Kaua'i, Maui, and Hawai'i Island) will receive \$1,000,000 in CWSRF funds to pilot cesspool replacement programs.

Currently, cesspool owners do not pay a sewer fee, so WAI is also advocating for policy change that would establish a **clean water fund**, where cesspool owners pay a small monthly or yearly fee into a fund that can be used to assist low and moderate-income homeowners in high-priority areas with their conversions. The intention of the fund would be to address areas with the highest impact on clean water that affects everyone.

Finally, if the costs of cesspool conversion can be wrapped into mortgage payments, homeowners would be able to pay the cost of cesspool conversion over a long time period and at low-interest rates. Therefore, WAI supports policy action to establish a **Point-of-Sale mandatory cesspool conversion**.



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# POLICY & ADVOCACY

**IN 2021 WAI WORKED WITH LEGISLATORS TO INTRODUCE MULTIPLE BILLS TO IMPROVE THE RATE OF CESSPOOL CONVERSIONS.**



In 2021, WAI worked with legislators to introduce multiple bills to improve the cesspool conversion rate. Our priority bills for the 2021 legislative session included:

- Mandatory Inspection & Conversion at Point of Home Sale
- Cesspool Registration Fee Bill
- Wastewater Improvement Credit
- Improvement of IWS Database
- Allow Distribution of EPA's State Revolving Funds to Appropriate Parties

In addition to building support for these priority bills, WAI and our Cesspool Legislative Taskforce showcased to the community and local legislators the impact these bills would have on solving Hawai'i's cesspool crisis. Establishing this critical framework enables us to be better prepared to pass several of these bills into law during the 2022 legislative session.



# COMMUNITY OUTREACH

Community outreach and education are vital in solving the cesspool crisis in Hawai'i. Across the state's 88,000 cesspools there are homeowners that are unaware of the environmental and health impacts that cesspools can have. WAI made great progress in 2021 in reaching the public through educational webinars, events, conferences and online and social media platforms.

**646 INSTAGRAM FOLLOWERS**

Water Branch  
**IB System**

**314 LINKED IN FOLLOWERS**

**349 FACEBOOK FOLLOWERS**

**797 NEWSLETTER SUBSCRIBERS**

**6,100 WEBSITE VISITS**

**IN SUPPORT OF HB2195 HD2**

**HB2195 HD2** establishes a cesspool pilot grant project to assist low- to moderate-income property owners with the costs of upgrading, converting, or installing a cesspool. This includes lessees on public lands. Applies to cesspools identified as failing by DOH.

**TESTIFY IN SUPPORT OF HB2088 HD3**

**HB2088 HD3** would allow community property owners to finance quality cesspool improvements through a non-ad valorem property assessment.

Testify on Wednesday, March 10, 2021, 1:00PM or via capitol.hawaii.gov

# COMMUNITY OUTREACH

## TOWN HALLS

### Local Legislators



Representative Lisa Marten



Senator Chris Lee



### Expert Q & A Panel after presentation



Dr. Roger Babcock  
Director of Facilities and Maintenance  
C&C of Honolulu  
Professor, University of Hawaii - Manoa



Michael Mezzacapo  
Outreach Specialist  
UH Sea Grant  
Water Resources Research Center



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WAI hosted two town hall meetings in 2021, one for residents of Waimanalo and the second for the residents of Kahalu'u on O'ahu. As higher priority areas for cesspool conversions, WAI targeted these neighborhoods to have an open dialogue with residents about what their best options for cesspool conversions might be.

## INNOVATIONS IN SANITATION CONVENING

In 2021, WAI hosted its second annual Innovations in Sanitation Convening! The hybrid event brought together key stakeholders both in-person and virtually to discuss Hawaii's wastewater issues and sustainable solutions. We had 35 guests in person and over 60 guests online. Some special guests included Senator Chris Lee, wastewater expert Dr. Roger Babcock, Deputy to the Chairman of the Department of Hawaiian Home Lands Tyler Iokepa Gomes, and Maui County Council member Kelly Takaya King.

## CESSPOOL 101 PRESENTATIONS FOR REALTORS

### Cesspool Conversion Process

- Hire a licensed engineer
- Submit Plans to Wastewater Branch for approval (done by engineer)
- Hire a licensed contractor once plans are approved to work with your engineer.
- Construction begins and old cesspool is either backfilled or removed depending on the property
- Once complete, licensed engineer submits IWS Construction Inspection Report with Contractor Certification Form to WW Branch

Step by Step Instructions can be found at [health.hawaii.gov/wastewater/iws](https://health.hawaii.gov/wastewater/iws)



In 2021, the WAI team hosted several presentations for real estate industry professionals. The goal of these presentations was to educate real estate agents on the basics of cesspool conversions; including legal duties to convert, conversion options, cost of conversion, and legislation that may affect their clients.





## BRINGING WAI TO A GLOBAL STAGE

WAI is a founding member of two exciting networks that are working on alleviating the issue of sewage pollution in rural environments and around the world. Through these collaborations, we can influence national policy, share solutions and experiences, and raise awareness of sewage pollution challenges and opportunities.

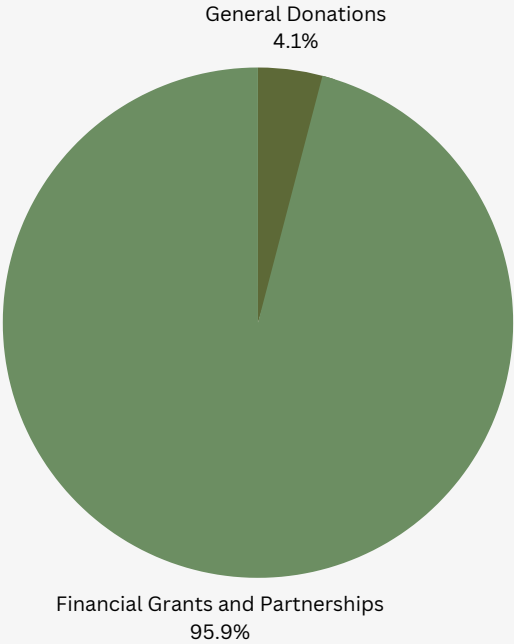
The **Decentralized Wastewater Innovations cohort** consists of five nonprofits groups that are working towards decentralized wastewater solutions throughout the US. The partner organizations work in Long Island NY, Alabama, Alaska, the Navajo nation, and Hawai'i. WAI hosted the Alaska Native Tribal Health Consortium and Dig Deep in Hawai'i, and participated in a knowledge exchange in Long Island with Stony Brook University. The group created and delivered a policy brief to the EPA, which resulted in expanding their focus on decentralized wastewater in the implementation of the IJJA.

The **Ocean Sewage Alliance** is a group of organizations, companies, researchers, and advocates who are working on ocean sewage pollution issues around the globe, with a focus on re-branding wastewater as a reusable, valuable resource. The Ocean Sewage Alliance is in the process of creating a knowledge hub and developing funding opportunities for partner organizations globally.

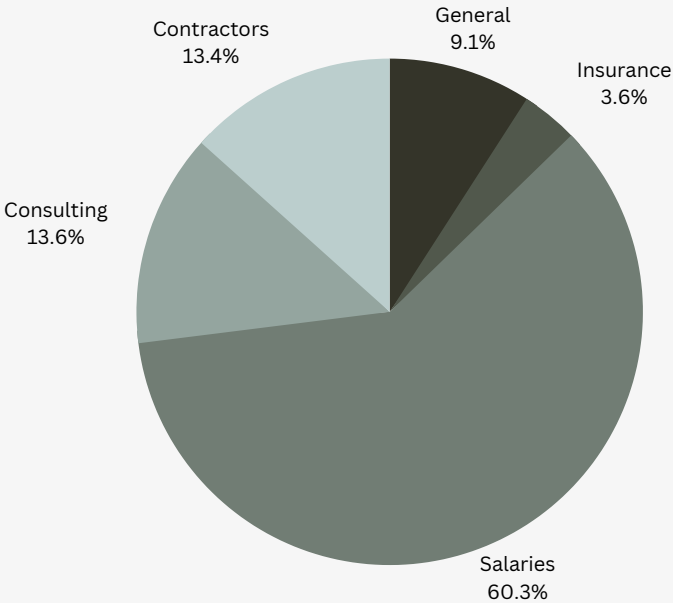
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# OUR FINANCIALS

## 2021 INCOME



## 2021 EXPENSES







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# OUR FINANCIALS

## 2021 INCOME

Foundation Grants & Partnerships	\$106,098
General Donations	\$4,500
<b>Total Income</b>	<b>\$283,850</b>

## 2021 EXPENSES

General	\$33,678
Insurance	\$13,391
Salaries & Related Expenses	\$223,027
Consulting & Professional Services	\$50,377
Contractors	\$49,430
<b>Total Expenses</b>	<b>\$369,903</b>

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# DONORS & PARTNERS

## DONORS

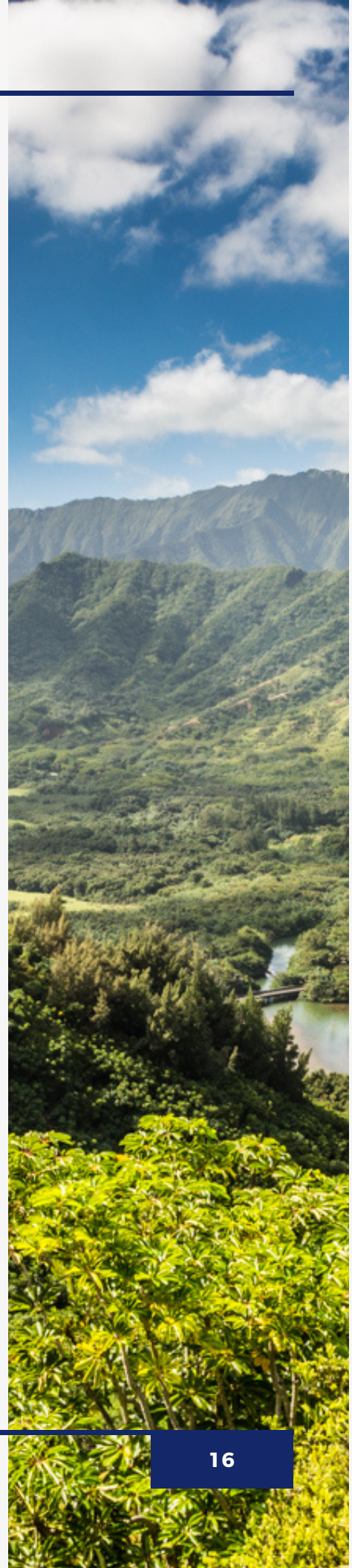
Edward Bohlen	Jamie Kranberg
Peter Cannon	Lani Cobb
Brett Gobar	Roger Babcock
Mahina Paishon-Duarte	Shaunagh Robbins
Garret Lau	Randolph Pritchard
Jason Louie	Joachim Schneider
Manuel Kulolo'ia	Stuart Coleman
James King	John Anner

## FOUNDATIONS

National Philanthropic Trust  
Castle Foundation  
Omidyar Network  
Ulupono Fund of the Hawai'i Community Foundation  
Kipuka Fund of the Hawai'i Community Foundation  
Healy Foundation  
Innovation Norway

## TECHONLOGY PARTNERS

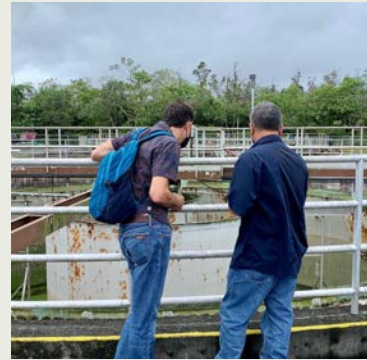
Biomass  
Cinderella Eco Group  
Cambrian  
Eljen Corporation  
Fuji Clean  
Orenco  
Ridge to Reefs  
WAI home



**MAHALO NUI LOA FOR SUPPORTING WAI!**

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**WE WOULD LOVE TO HEAR FROM YOU!  
PLEASE CONTACT US AT  
INFO@WAICLEANWATER.ORG TO TALK STORY OR  
GET MORE INVOLVED.**



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C/O STUART COLEMAN

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