

The County of Maui's Water Reuse Program: An Overview

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DLNR
Commission on Water Resources Management
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Presentation Outline

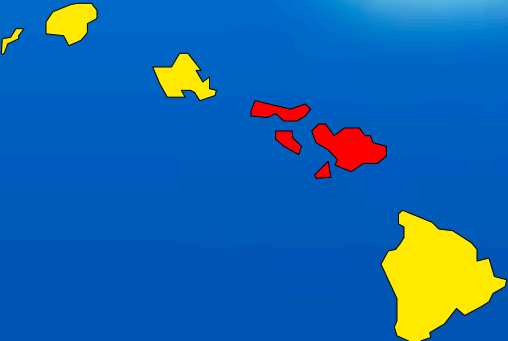
- **Background Information**
- **Program Development**
- **Program Results**
- **Planned Improvements**
- **Lessons Learned**



Background Info.

Maui County

★ Wastewater Reclamation Facility Locations



Driving Factors

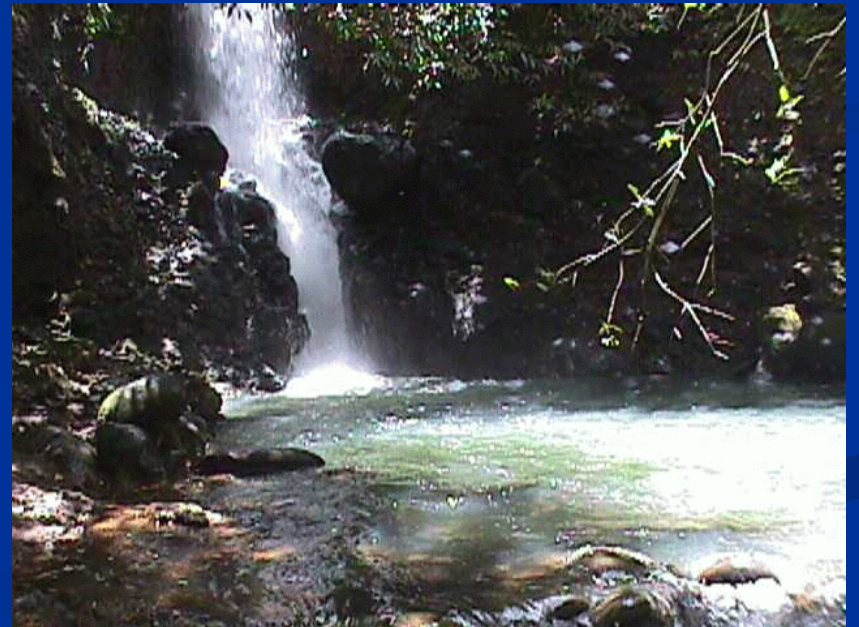
- **Wastewater Effluent Disposal Concerns**
- **Lack of Available Fresh Water**



Wastewater Effluent Disposal



Lack of Available Fresh Water



Iao Aquifer



- Supplies potable water to Central & South Maui
- Sustainable Yield: 18 mgd
- Daily use at times exceeded 20 mgd
- Trends indicate declining well head levels and increased salinity levels
- Designated by CWRM

Program Development



Key Components of Maui County's Water Reuse Program

- 1991-2: Feasibility Studies Conducted
- 1993: Water Recycling Program Coordinator Position Created
- 1993: Proactive Public Education Program Initiated
- 1995-6: Lahaina & Kihei WWRF's Upgraded to R-1 Recycled Water Capability
- 1995: Mandatory Recycled Water Use Ordinance Passed (MCC 20.30.050)

Key Components of Maui County's Water Reuse Program

- **1996: Rules for Recycled Water Service Established**
- **1997: Community Based Rate Structure Established**
- **1997 – 2006: Recycled Water Distribution Systems Constructed**
- **2009 – 2010: Mayor's "Wastewater Community Working Group" Convened**
- **2009 – 2011: Recycled Water Verification Studies Completed**

Program Results

Current Uses of Recycled Water in Maui County

■ Landscape Irrigation

- Golf Courses
- Schools
- Parks
- Residential Complexes
 - Multi-Family
 - Single-Family
- Shopping Center
- Road Shoulders & Medians

■ Industrial Uses

■ Agricultural Irrigation

- Seed Corn

■ Dust Control

■ Composting

■ Toilet/Urinal Flushing

■ Fire Control

■ Wildlife Habitat

■ Drinking Water for Cattle

County of Maui

Recycled Water Rates & Fees

■ Rates

- Major Agriculture: \$0.15 per 1000 gallons
- Agriculture (incl. golf courses): \$0.33 per 1000 gallons
- All Others: \$1.28 per 1000 gallons
- Avoided Cost: Match rate of available non-potable water source
- **Full Cost Recovery:** \$2.42 per 1000 gallons
- **Philosophy:** Sewer User Fees Subsidize Water Reuse Program

■ Connection Fees

■ Meter Fees

County of Maui

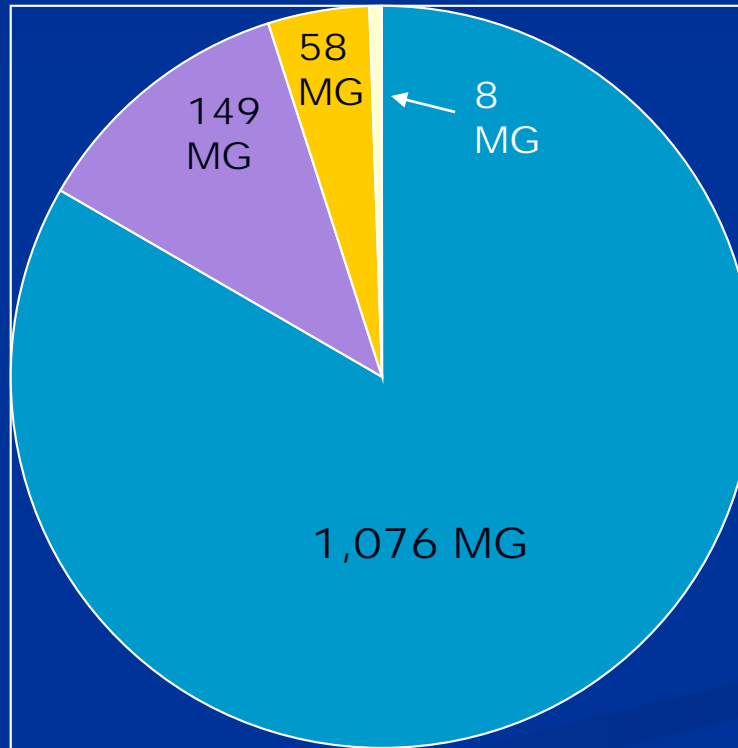
FY 2012 Reuse Volumes

- **1.29 Billion Gallons Reused
(31% of Recycled Water
Produced)**
- **588 Million Gallons of
Potable Water Saved**



32.7 Days of Typical Daily Use
for Maui's Iao Aquifer

FY2012 Reuse Category Breakdown



- Landscape Irrigation
- Industrial Use
- Agricultural Irrigation
- Construction Use

Water Reuse from County of Maui Wastewater Reclamation Facilities (mgd) FY 2012

Facility	Design Flow (mgd)	Avg. Flow (mgd)	Avg. Reuse (mgd)	Peak Reuse (mgd)	Avg. % Reuse
Kihei (R-1)	8.0	3.34	1.65	1.95	49.5
Lahaina (R-1)	9.0	3.82	1.41	1.80	36.9
Wai-Kah (R-2)	7.9	3.85	0.16	0.17	4.3
Molokai (R-2)	0.3	0.16	0.08	0.01	4.9
Lanai (R-1)	0.5	0.30	0.30	0.35	100.0
TOTALS	25.7	11.47	3.53	4.28	30.8

Where does it go? (11.47 mgd average for 2012)

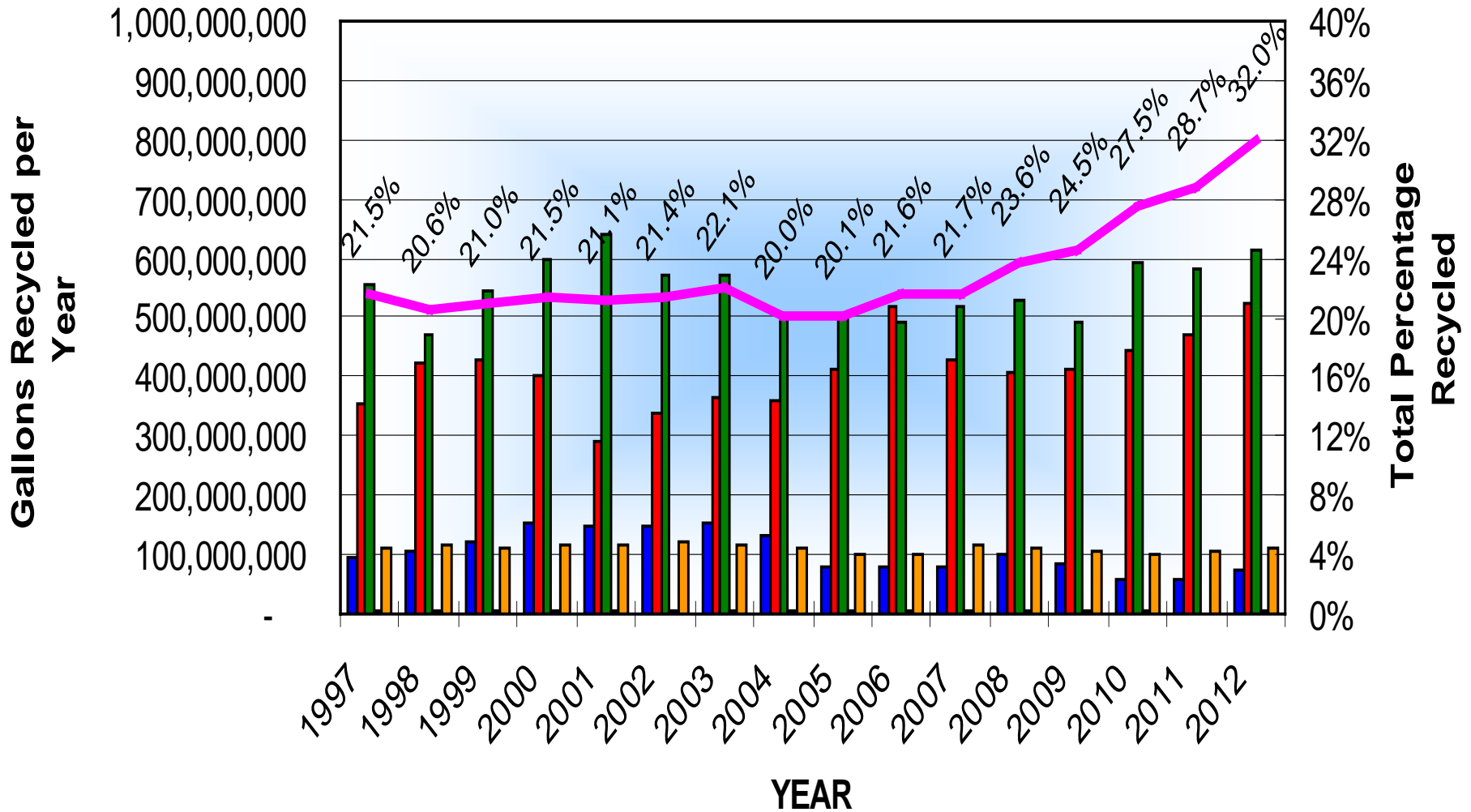


**Disposal via injection wells
(69% or 7.9 mgd)**



**Water Reuse
(31% or 3.5 mgd)**

COUNTY OF MAUI RECYCLED WATER PROGRESS



■ Kahului
 ■ Lahaina
 ■ Kihei
 ■ Molokai
 ■ Lanai
 — % Effluent Reused vs Flow Proc

Distribution Systems

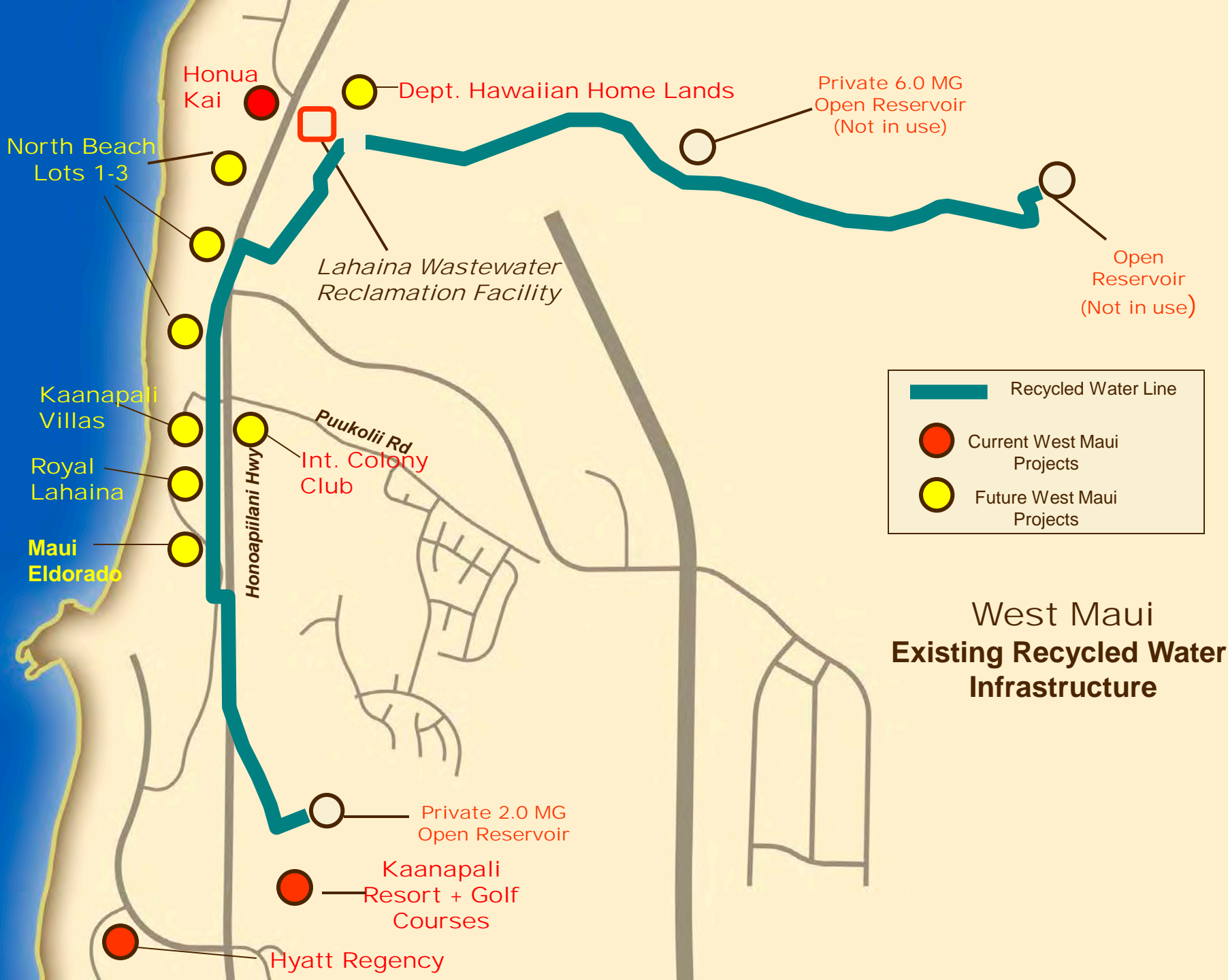
Water Reuse in West Maui





Maui County's largest recycled water customer. Up to 1.2 mgd of R-1 water used for landscape irrigation of golf courses, common areas and roadside medians.





Water Reuse in South Maui



South Maui Existing Recycled Water Infrastructure



1.0 MG Recycled Water Storage Tank

CONSERVING OUR WATER RESOURCES
RECYCLED MATERIALS FOR REUSE
DO NOT DRINK
Water of Maui, Hawaii - Recycled and Reusable

WELCOME TO



**SOUTH MAUI
COMMUNITY PARK**
DEPARTMENT OF PARKS AND RECREATION

PARK HOURS - 7:00 AM TO 10:00 PM
GATES WILL BE LOCKED AT 10:00 PM

THE FOLLOWING ARE FOR THE SAFETY OF OUR USERS:

 DOGS MUST BE ON LEASH. PLEASE CLEAN UP AFTER YOUR DOG.	 NO CONSUMPTION OF ALCOHOL IN PARKING LOT.	 NO OVERNIGHT CAMPING.	 NO MOTOR VEHICLES ALLOWED ON PATHWAY OR GRASS.
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FIELDS ARE OPEN FOR PUBLIC USE.
TO RESERVE A FIELD OR FACILITY CALL
THE PARKS PERMIT OFFICE AT 808-879-4364

Maui No Ka Oi

MCC 13.04



Hokulani Golf Villas



Maui Research & Technology Park

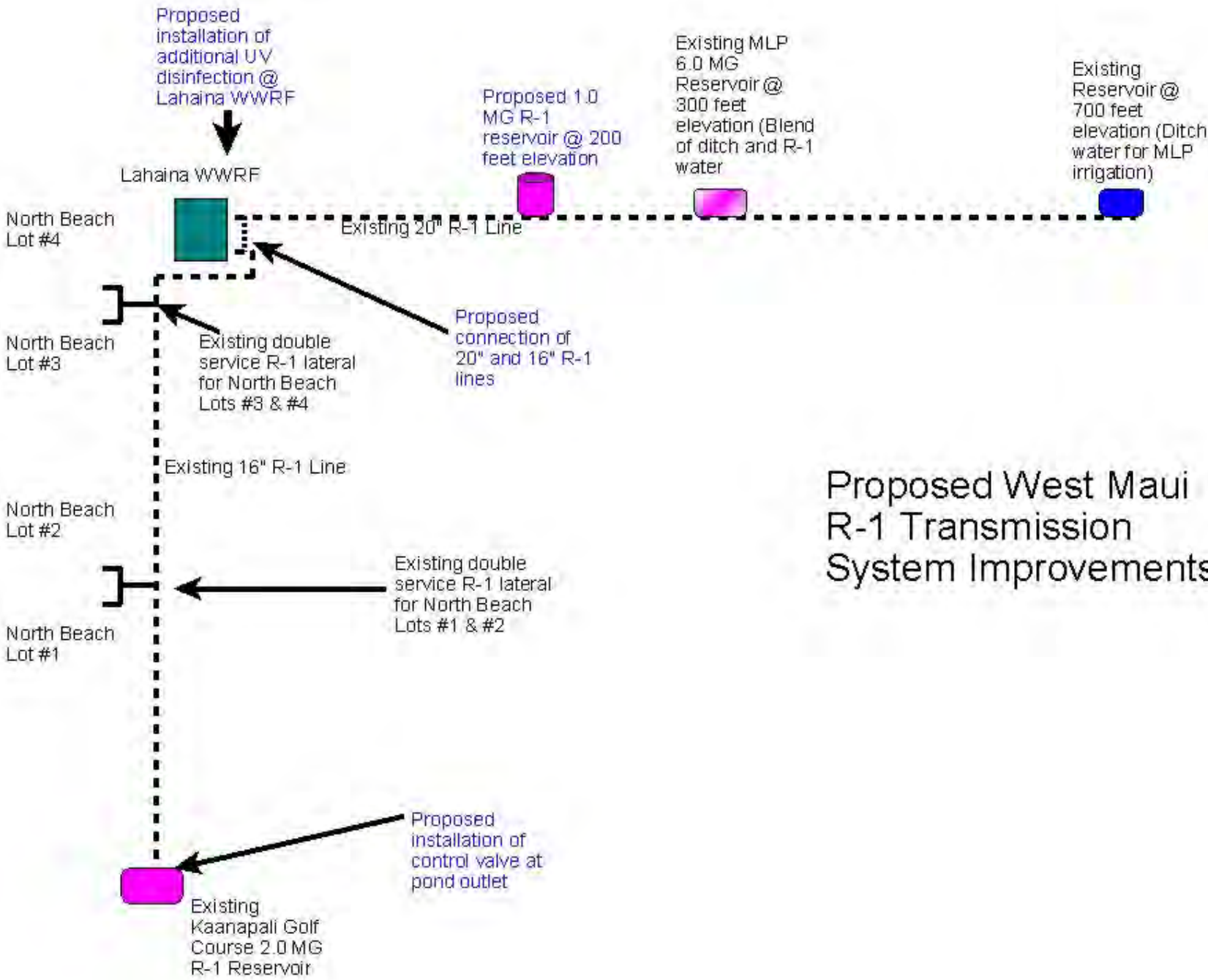


PLANNED IMPROVEMENTS



West Maui R-1 System Planned Improvements

- **Effluent Filtration Upgrade**
- **Additional UV Disinfection Capacity (9.0 mgd) at Lahaina WWRP**
- **Distribution System Improvements**
 - Elevated Storage (1 MG tank), pump station, pressure sustaining valve, R-1 laterals
 - Land (DHHL)
- **Distribution Pipe Lines (Pending Funding)**
 - Kaanapali Resort
 - Honokowai
- **In-Plant Storage**

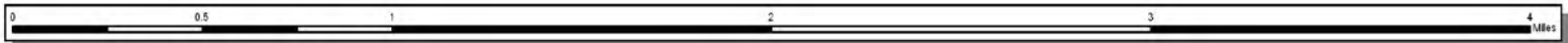
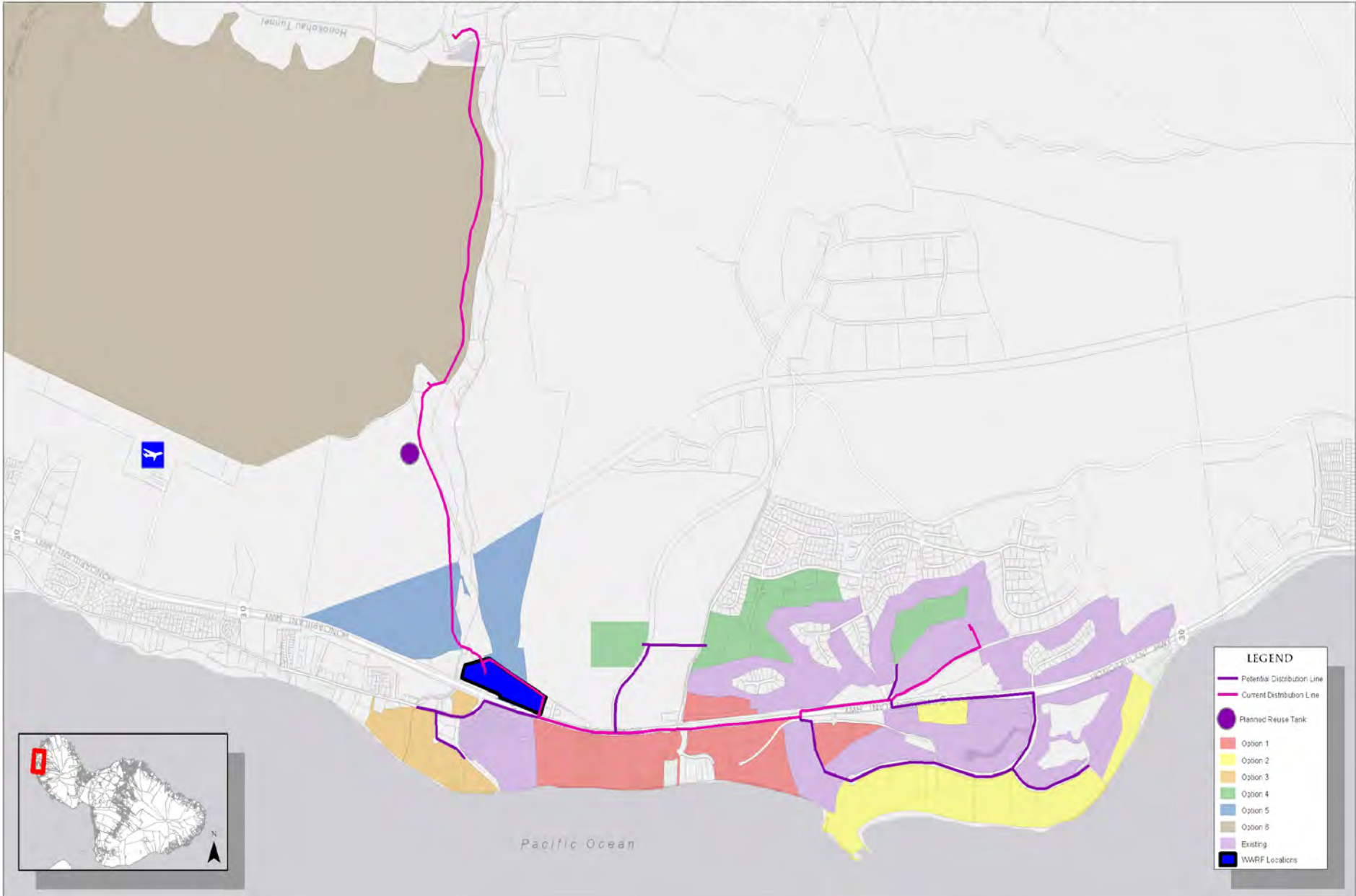


Proposed West Maui R-1 Transmission System Improvements

West Maui R-1 Water System Planned Improvements

- **Effluent Filtration Upgrade**
 - Retrofit Dynasand Filters with Aqua Disk Fabric Filters
 - Construction: FY 2013, Cost: \$3 million
- **UV Capacity (9.0 mgd) – Phase 1A**
 - Design: FYs 2011-12, Cost: \$568,622
 - Construction: FY 2013, Cost: \$5.9 million
- **Distribution System Improvements (tank, pumps etc.) – Phase 1B**
 - Design: FYs 2012-2013, Cost: \$242,378
 - Construction: FY 2014, Cost: \$3.18 million (est.)
- **Distribution System Expansion (Kaanapali Resort, In-plant storage)-Phase 2**
 - Design FY 2014
 - Construction FY 2016
- **Funding Sources**
 - West Maui Developers – Fair Share Contributions
 - County of Maui DEM – SRF or Bond
 - Bureau of Reclamation, Title XVI (for Phase 2)
 - 25% of Total Project Cost

WEST MAUI POTENTIAL R-1 RECYCLED WATER EXPANSION OPTIONS



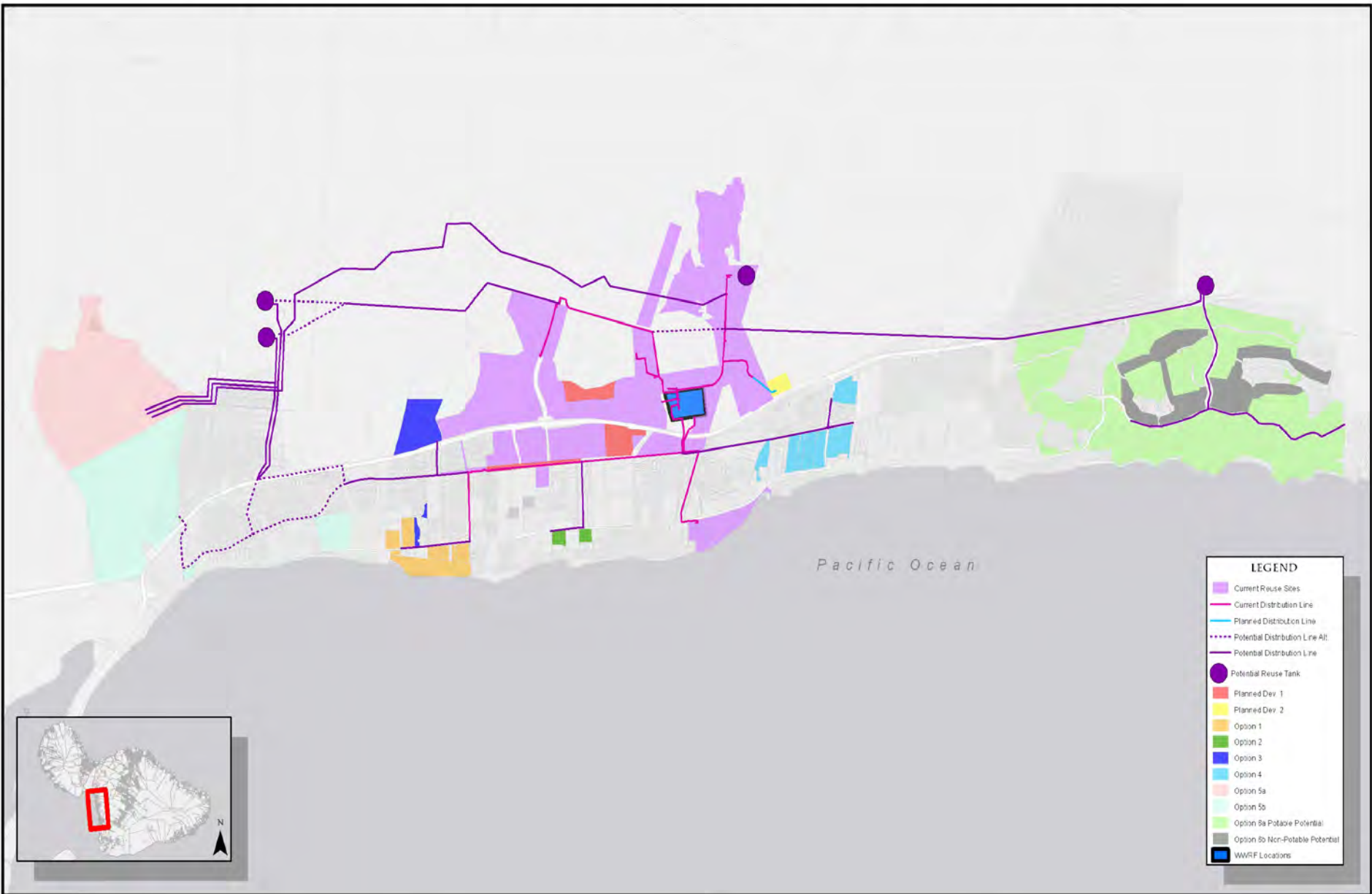
1 inch = 1,550 feet / 1 inch = 0.29 miles



South Maui Planned R-1 System Planned Improvements

- **Upgrade Effluent Filtration**
 - Retrofit Dynasand Filters with Aqua Disk Fabric Filters
 - Construction: FY 2013, Cost: \$3 million
- **Extend 12" R-1 line to Kihei Road**
 - Design: FY 2013 Construction: FY 2014
 - Landscape Irrigation at Condominiums and Waipulani Park
 - Projected Irrigation Demand: 0.25 mgd
- **Extend 12" R-1 line to Proposed Site of New Kihei High School**
 - Design: FY 2015 Construction: FY 2017
 - Landscape Irrigation at Kihei High School & Kamali`i Subdivision
 - Projected Irrigation Demand: Approx. 0.245 mgd
- **Add Additional 1 MG R-1 Tank, Upgrade R-1 Pump Station**
 - Design FY 2015 Construction: FY 2017
- **Funding Sources: SRF, Cash**

SOUTH MAUI POTENTIAL R-1 RECYCLED WATER EXPANSION OPTIONS



LEGEND

- Current Reuse Sites
- Current Distribution Line
- Planned Distribution Line
- Potential Distribution Line Alt
- Potential Distribution Line
- Potential Reuse Tank
- Planned Dev 1
- Planned Dev 2
- Option 1
- Option 2
- Option 3
- Option 4
- Option 5a
- Option 5b
- Option 5a Potable Potential
- Option 5b Non-Potable Potential
- WWRF Locations



1 inch = 2,600.22 feet / 1 inch = 0.63 miles



Lessons Learned

Maui's Water Reuse Experience

Lessons Learned

- **Maintain the Momentum**
- **If You Build It, They Will Come**
- **Share the Financial Burden**
- **Involve the Community**
- **Create a Dedicated O&M Staff**
- **Assign a Champion**
- **Multiple Benefits**
- **Elevate the Priority**

Questions?
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