

# Revision of Recycled Water Guidelines Updates



Hawaii Department of Health  
Environmental Management Division  
Wastewater Branch

12 August 2015

# Summary of Revisions

Revised into two volumes:

1. Irrigation guidelines (1<sup>st</sup> stage) – Target date to finalize by end of August.
2. Technical guidelines (2<sup>nd</sup> stage) – Target date to finalize by end of October.



# Guidelines for Irrigation

- Streamlined to make it easier to use
- Basis of design and engineering reports not required for water reuse projects
- Simplified process by creating Recycled Water application forms for irrigation, ag use and non-irrigation use.
- Include irrigation BMPs
- Removed Groundwater Monitoring Requirements



# Guidelines for Irrigation

- Stakeholders – Irrigation Specialists, Department of Agriculture, private engineering consultants, Farm Bureau, DLNR, Honolulu Board of Water Supply, County of Maui and Kauai Wastewater Divisions and DOH staff from the Wastewater Branch and Safe Drinking Water Branch



# Assistance from HCF

- Hawaii Community Foundation provided financial assistance by hiring a facilitator to facilitate our meetings and Brown & Caldwell to assist with researching other State's requirements on groundwater monitoring for the application of reuse water.



# Irrigation Guidelines

- Covers the suitable uses of R-1, R-2 and R-3 reclaimed water.
- Areas approved for application
- Distribution System Requirements

# Irrigation Guidelines

- BMPs for:
  - ✓ Design & Installation
  - ✓ Component Identification
  - ✓ Public Education
  - ✓ Owner Responsibility
  - ✓ Operation & Maintenance

# Areas Approved for Application

- **Unrestricted Areas** are areas where recycled water application is unconditionally allowed;
- **Conditional Areas** are areas where recycled water application is currently allowed, but may, in the future, be subject to monitoring requirements or restrictions; and
- **Restricted Areas** are areas where recycled water application is prohibited.

# Manage Recycled Water Application to Address the Following Concerns

- Degradation of drinking water quality due to
  - Contamination by emerging contaminants
  - Increases in chloride concentration
- Degradation of aquatic and marine ecosystems due to
  - Degraded groundwater discharging to surface water
  - Increasing nutrient load
  - Contamination by emerging contaminants

# Recycled Water Use Management

- Goal:
  - Encourage and facilitate the productive use of recycled water,
  - PREVENT and adverse impact to human health and the environment that may occur by,
    - Consumption
      - i.e. public drinking water sources
    - Discharge of degraded groundwater to:
      - Coastal waters
      - Wetlands
      - Perennial streams

# What is in Recycled Water?

## Wastewater Related Compounds

- 47 analyzed for in various studies
  - Pharmaceuticals and Personal Care Products
  - Fecal sterols
  - Disinfection by products
  - Detergents and fragrances
  - Other wastewater indicator compounds
- Detected in wastewater – 28
- Detected in groundwater – 25
  - Pharmaceuticals and PCPs – 6
  - Fecal sterols – 3
  - Disinfection byproducts – 1
  - Detergents and fragrances – 7
  - Other wastewater indicator compounds – 8

## Low-Low-Low Concentrations

- Measured in nanograms (parts per trillion).
- No regulatory limits.
- Concentrations in surface waters are miniscule when compared to pharmaceutical doses.

- Acetaminophen in Tylenol  
325 mg
- Acetaminophen in water  
0.00000005 mg/L

But to put things in perspective

From Crawford (2011)

Surface water study, but concept is still applicable to groundwater

## Mediterranean Sea

You would have to drink

**6.5 billion liters of water**

to get one dose of regular strength Tylenol



# What Else is in Recycled Water?

- Elevated chloride concentrations
  - Lahaina Wastewater Reclamation Facility
  - Kihei Wastewater Treatment Plant
- Elevated nutrient concentrations
  - Total Nitrogen
    - Lahaina
    - Kihei
  - Total Phosphorus
    - Lahaina
    - Kihei
- But generally meets SDWA standards
  - Metals
  - Organic contaminants
  - TDS and Cl a little high

# Recycle Water Use Considerations

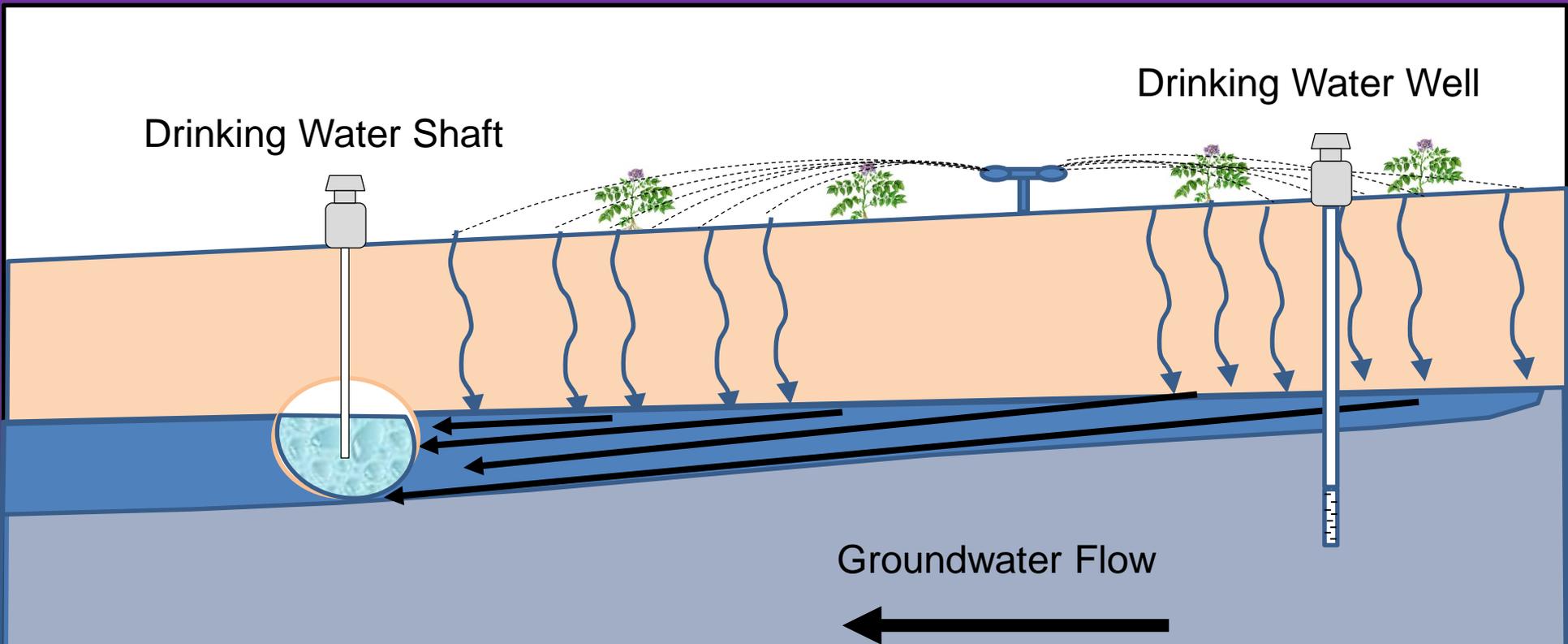
- Public drinking water sources
  - Wells,
  - Shaft,
  - Springs,
- Conservation districts
  - Groundwater discharge to surface water
    - Anchialine ponds
    - Shelter bays, and
    - wetlands

# Recycled Water Use Zones

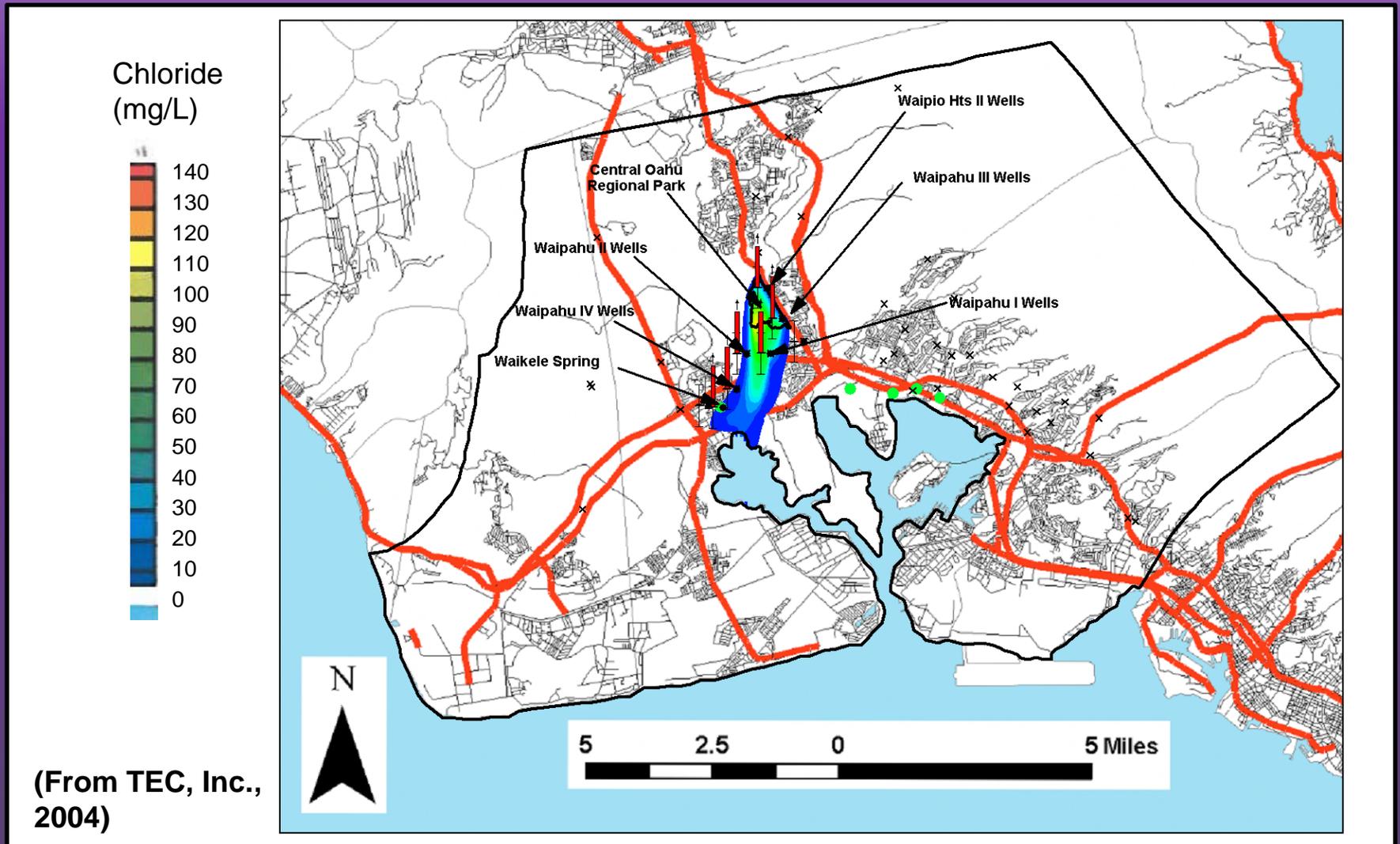
- Restricted Areas
  - Zone B Capture Zone Delineation for public drinking water sources that:
    - Draw water from skimmer shafts
    - Are designated as Groundwater Under the Direct Influence of Surface Water (springs and some water development tunnels)

# Restricted Areas

- The Zone B Capture Zones Delineations for Public Drinking Water Wells served by a shaft or designated as Groundwater under the Direct Influence of Surface Water



Modeling has estimated that using recycled water to irrigate the Central Oahu Regional Park could increase groundwater  $\text{Cl}^-$  by up to 100 mg/L



# Recycled Water Use Zones

- Restricted Areas
  - Zone B Capture Zone Delineation for public drinking water sources that:
    - Draw water from skimmer shafts
    - Are designated as Groundwater Under the Direct Influence of Surface Water (springs and some water development tunnels)
  - Critical Reserves (from DBEDT Reserves GIS coverage)
    - Wetlands
    - Anchialine ponds
    - Enclosed bays

# Restricted Areas

- Within 1000 ft. of a critical Reserve,
  - Wetland (Kawainui)
  - Enclosed bay (Hanauma Bay)
  - Anchialine ponds, and
  - Perennial stream
- Designated as a reserve



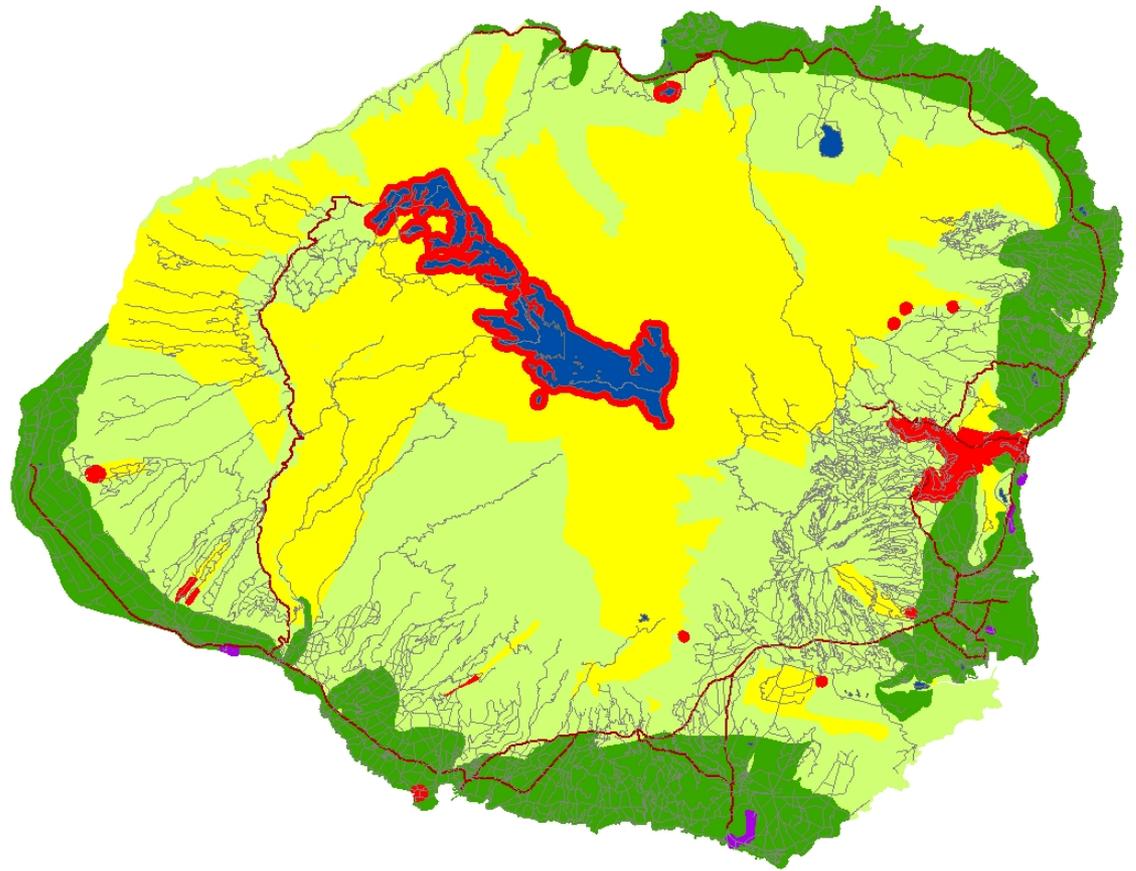
DLNR, 2011

# Recycled Water Use Zones

- Conditional Area I
  - Zone C Capture Delineation for public drinking water sources that:
    - Draw water from skimmer shafts
    - Are designated as Groundwater Under the Direct Influence of Surface Water (springs and some water development tunnels)
  - Forest Reserves and Protected Conservation Districts
- Conditional Area II
  - All other areas with the exception of the Unrestricted Areas

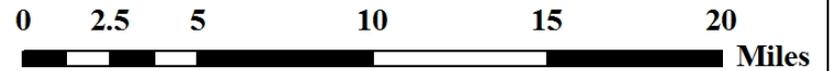
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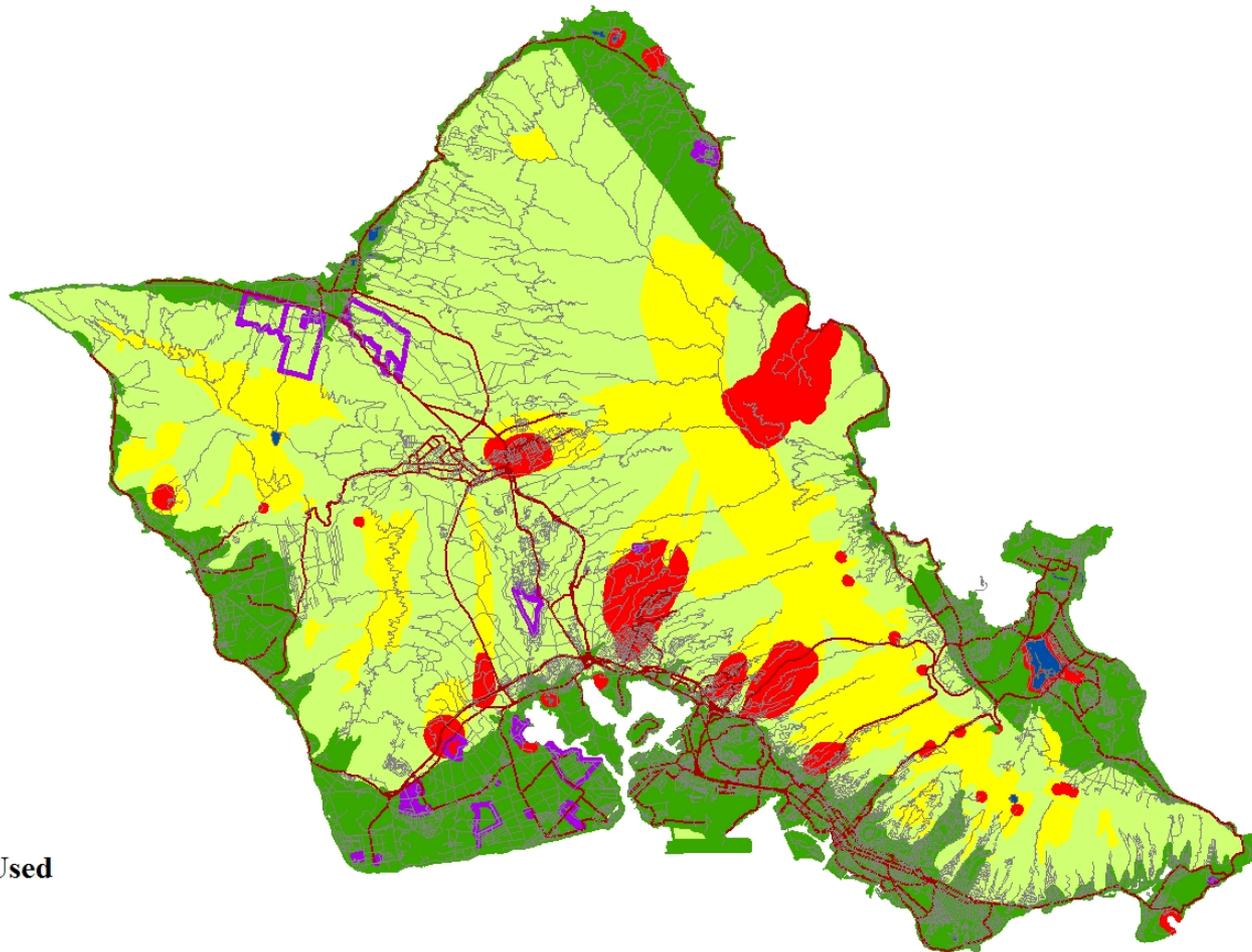
- Unrestricted Areas
  - Makai of the UIC line
  - Areas where primary aquifer is confined by caprock



### Legend

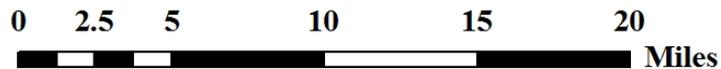
- Other Roads and Streets
- Major Roads
- Designated Wetlands
- Recycled Water - Currently Used
- Unrestricted Areas
- Conditional Area I
- Conditional Area II
- Restricted Areas

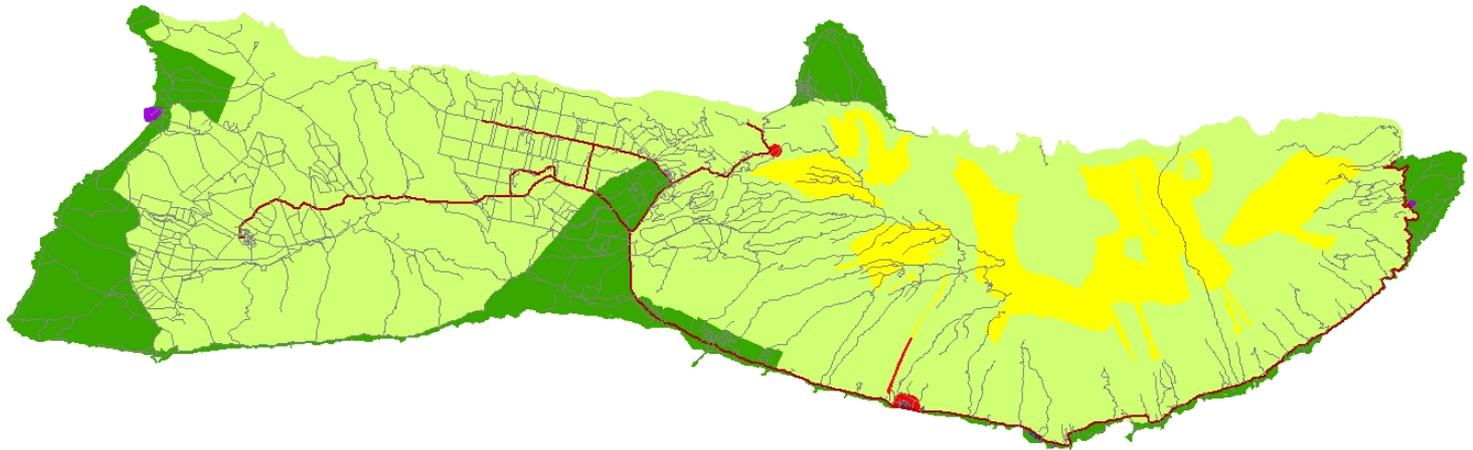




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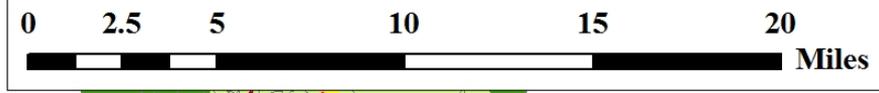
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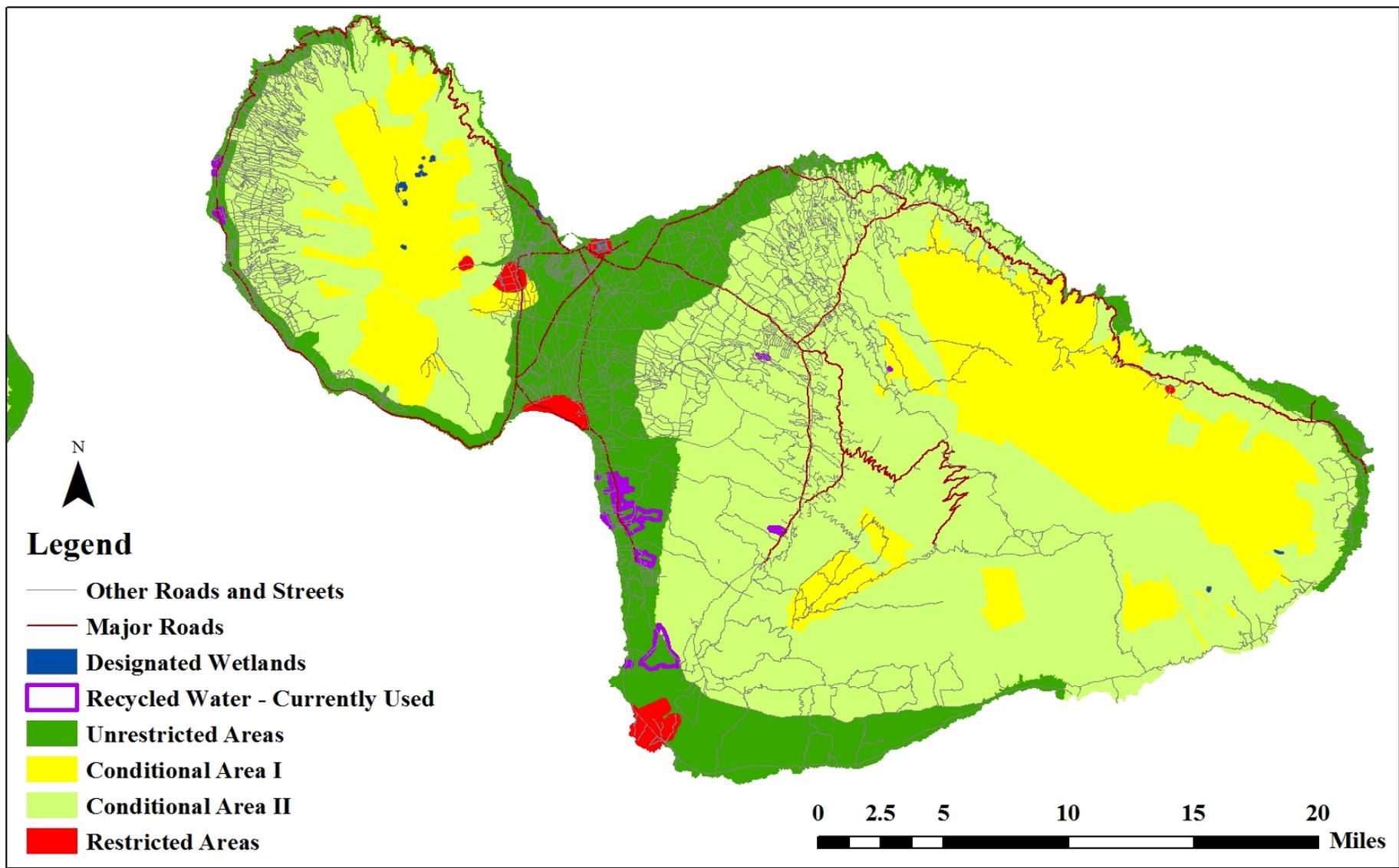


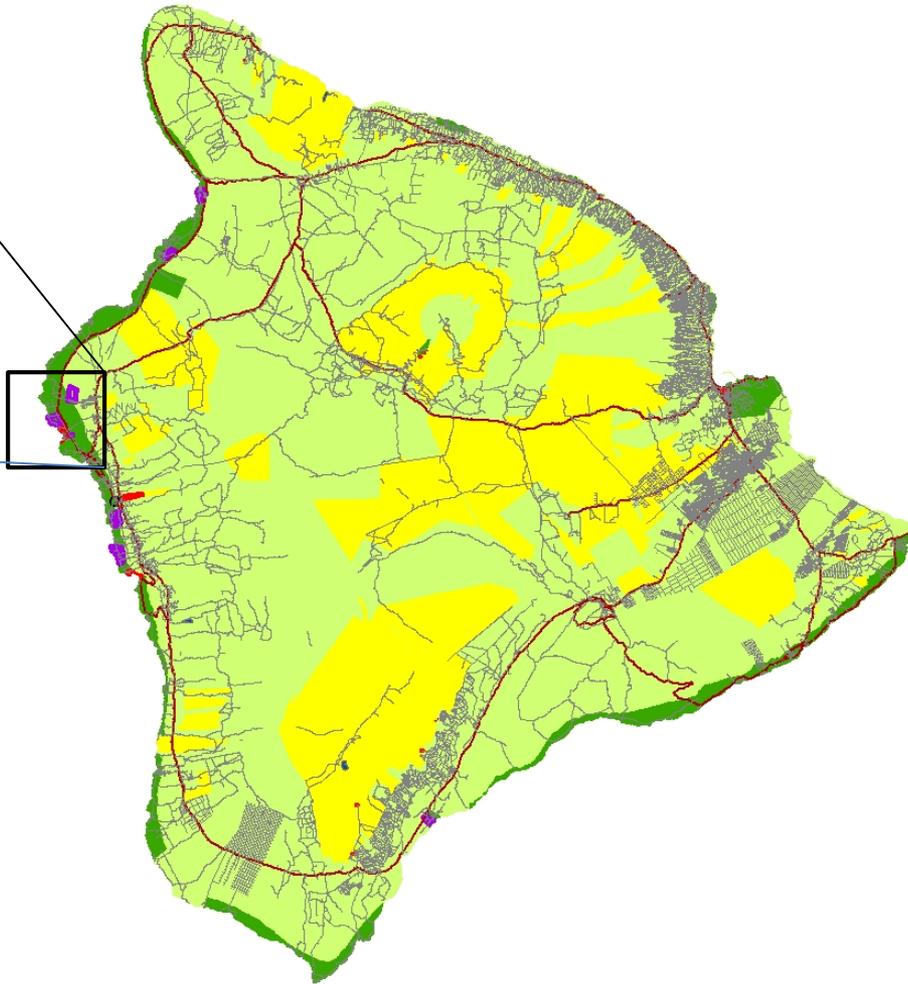
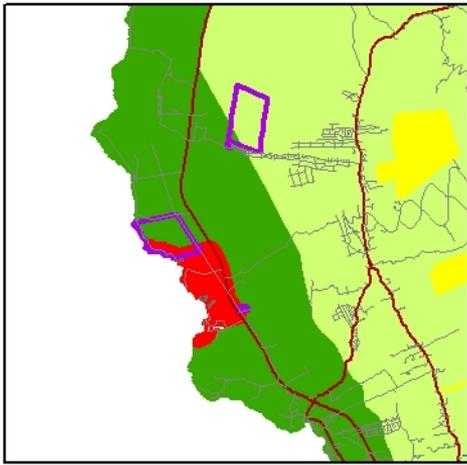


**Legend**

- Other Roads and Streets
- Major Roads
- Designated Wetlands
- Recycled Water - Currently Used
- Unrestricted Areas
- Conditional Area I
- Conditional Area II
- Restricted Areas

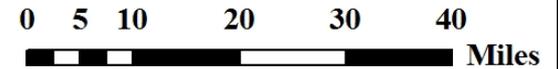






### Legend

-  Other Roads and Streets
-  Major Roads
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# Application for a Recycled Water Project

- **General Irrigation Use**
- **Agricultural Irrigation Use**
- **Non-Irrigation Use**
- **Short Duration Use**

# Application Requirements

- Application must be prepared by an Irrigation specialist, licensed architect, landscape architect or licensed engineer. Farms greater than 15 acres in size is exempt from this requirement.

# Application Requirements

- Applicant Information
- Project Information
- Wastewater Reclamation Facility Supplying Recycled Water
- Recycled Water Irrigation Plan

# Application Requirements

- Recycled Water Manager Information
- Application Preparer Information
- Applicant Certification
- ✓ Applicable BMPs will be implemented
- ✓ Comply with cross connection and backflow provisions; and
- ✓ Owner Responsibility as noted in guidelines

# Next Steps

- Finalize the Irrigation Guidelines by August 31<sup>st</sup> for the Director of Health's signature.
- Work on the Technical Guidelines and set a deadline of October 31<sup>st</sup> to complete.

# Contact

- Contact the Wastewater Branch at  
(808) 586-4294
- Website: <http://health.hawaii.gov/wastewater/>

# Questions?