

WR Committee

From: Eva Blumenstein <Eva.Blumenstein@co.maui.hi.us>
Sent: Monday, January 22, 2018 3:00 PM
To: WR Committee
Cc: Gladys Baisa; Shelly K. Espeleta
Subject: WR-18 Wellhead Protection Overlay District
Attachments: WPOZ WRC 012418.pdf

Aloha Chair Atay:

Please find attached the Department of Water Supply's presentation on Wellhead Protection Overlay Zoning for WRC 1/24/18 meeting.

Mahalo,

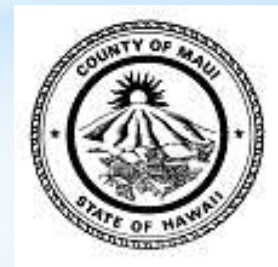
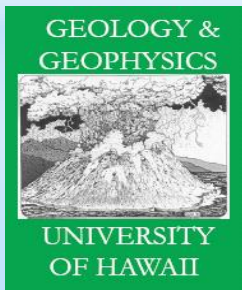
Eva

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Maui County Department of Water Supply

Wellhead Protection Through Zoning in Maui County

County Council Water Resources Committee
January 24, 2018

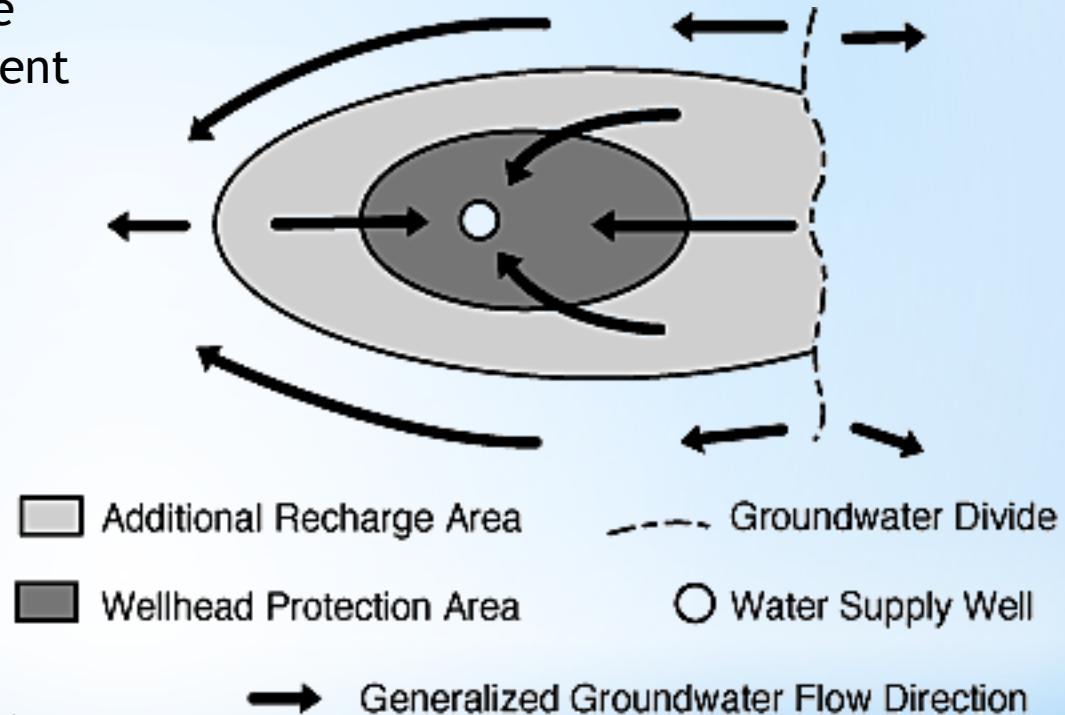


What is the Wellhead Protection Program?

Developed through collaborative process to protect County's potable wells from contamination and prevent the need for expensive treatment

Wellhead Protection Area:

The surface and subsurface area surrounding a well, through which contaminants are reasonably likely to reach the well

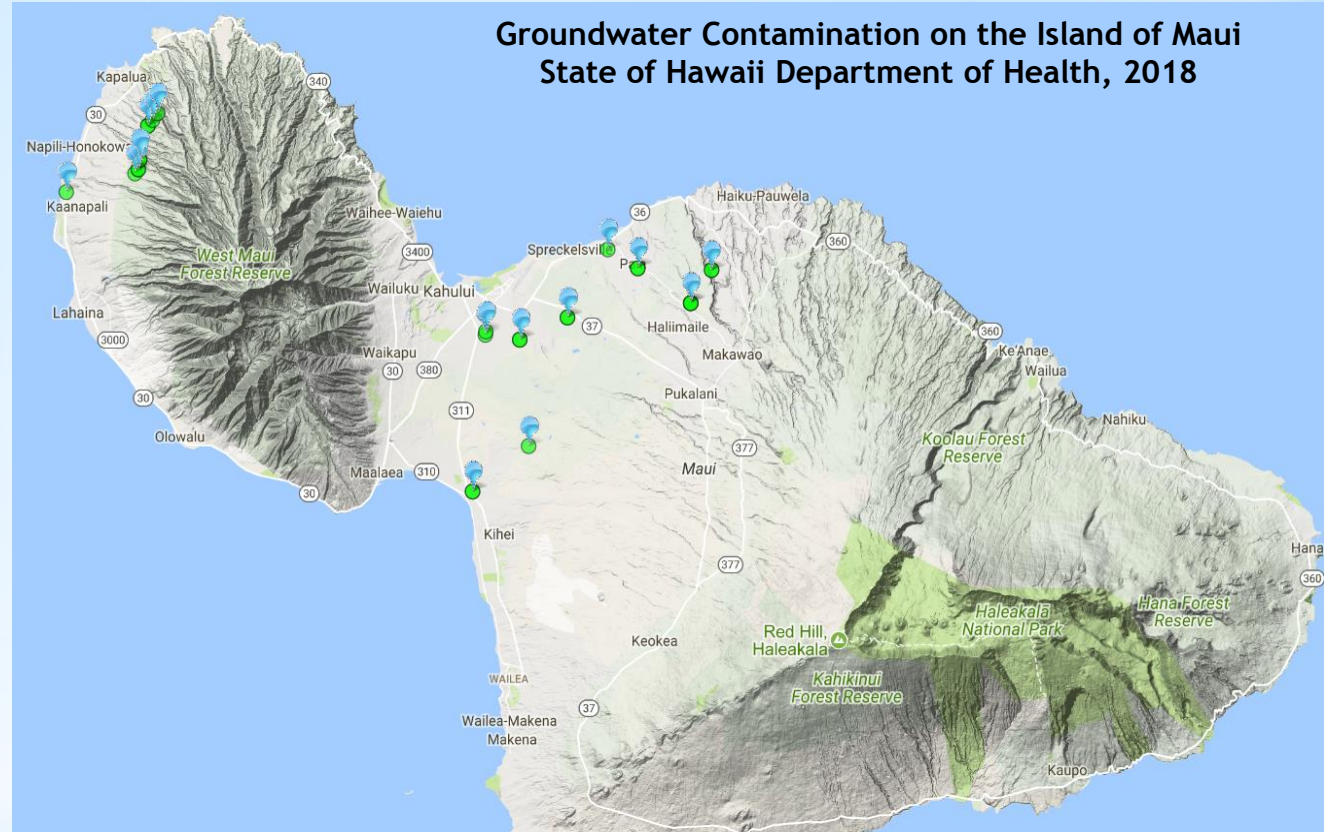


Common sources of contamination:

- Leaks & spills from chemical storage
- Industrial processes
- Pesticide and fertilizer applications
- Cesspools

Why Wellhead Protection?

- 70% of Maui's drinking water supply is groundwater
- Years between contaminating event and detection
- Aquifers ranked as vulnerable to contamination
- Organic compounds detected in 73% of Oahu public supply wells
- Gaps in regulations put our drinking water wells at risk



Maui Island Plan:

“Complete and implement DWS wellhead protection program to protect the water quality of public and private wells”

Community Plans:

“Promote and implement programs for groundwater and wellhead protection”

Prevention or Treatment?

Contamination :

Treatment

Monitoring

Alternate water supplies

Remediation

Litigation

Treatment Technology	Estimated Unit Cost \$/1,000 gallons treated)
Granular Activated Carbon (VOCs)	\$0.32 - \$1.47*
Reverse Osmosis (Nitrate)	\$1.19 - \$2.1

*Carollo Engineers, 2007 City of Fresno Metropolitan Water Resources Management Plan Update, Technical Memorandum 1.4 Groundwater Contaminants and Treatment Alternatives

Honolulu BWS annual O&M costs for GAC: \$2.5M

Cost to clean up groundwater exceeds prevention cost at a 3:1 ratio



Prevention:

Simpler

Less expensive

More reliable over long term

1. Delineate wellhead protection areas
2. Inventory potentially contaminating activities
3. Develop wellhead protection strategy with public participation

How is Wellhead Protection Regulated?

U.S. EPA
Safe Drinking Water Act



State Department of Health
Safe Drinking Water Branch



Maui County Water Department
Maui County Planning Department
Advisory Committee

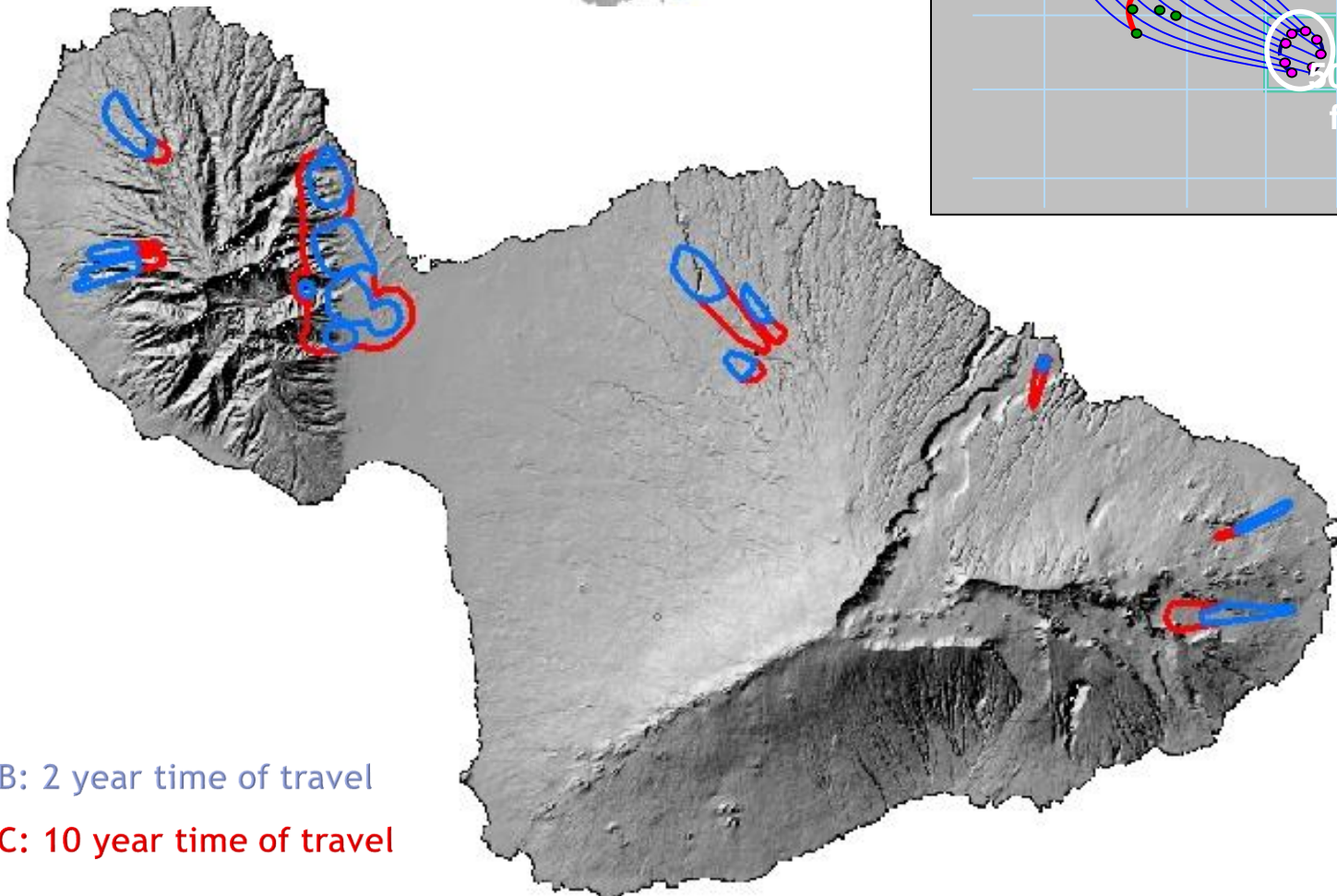
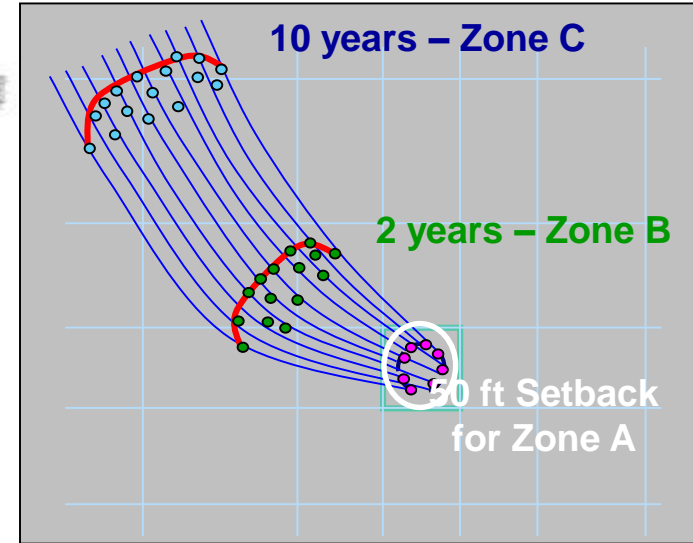
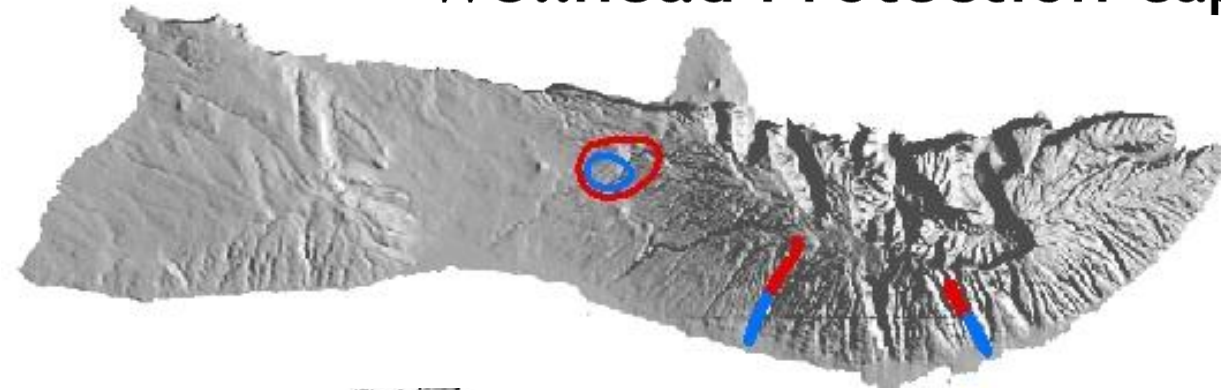
Mandate states to:

- Conduct assessments of public drinking water sources
- Develop Wellhead Protection Program
- Adopt drinking water rules

- Source Water Assessment
- Wellhead Protection Program - guidelines for *county/community based* measures
- Financial and technical assistance for *wellhead protection implementation*
- Drinking water rules

- Review regulatory framework
- Public process
- Protection strategies and ordinance

Wellhead Protection Capture Zones



-  Zone B: 2 year time of travel
-  Zone C: 10 year time of travel

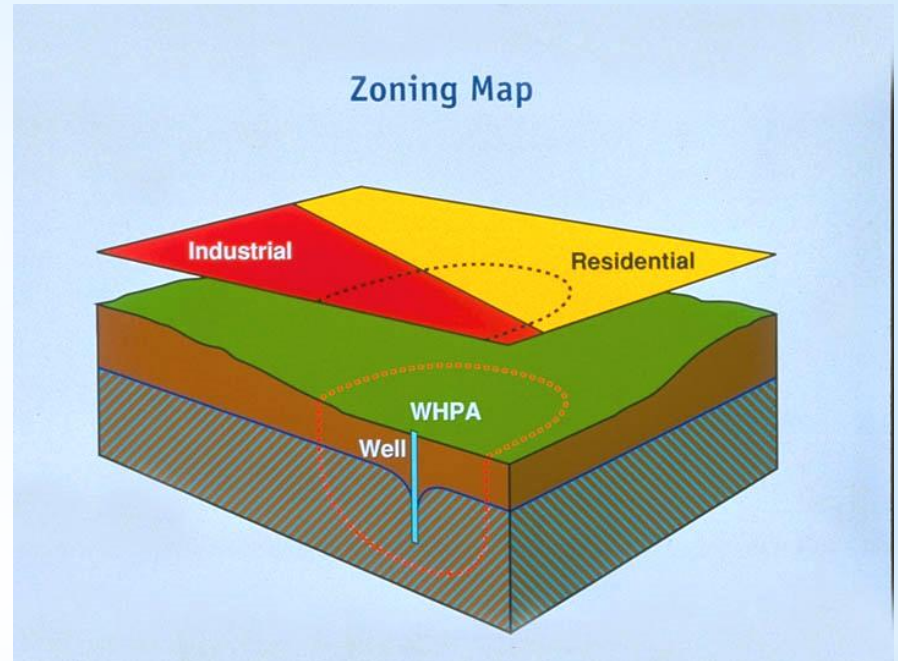
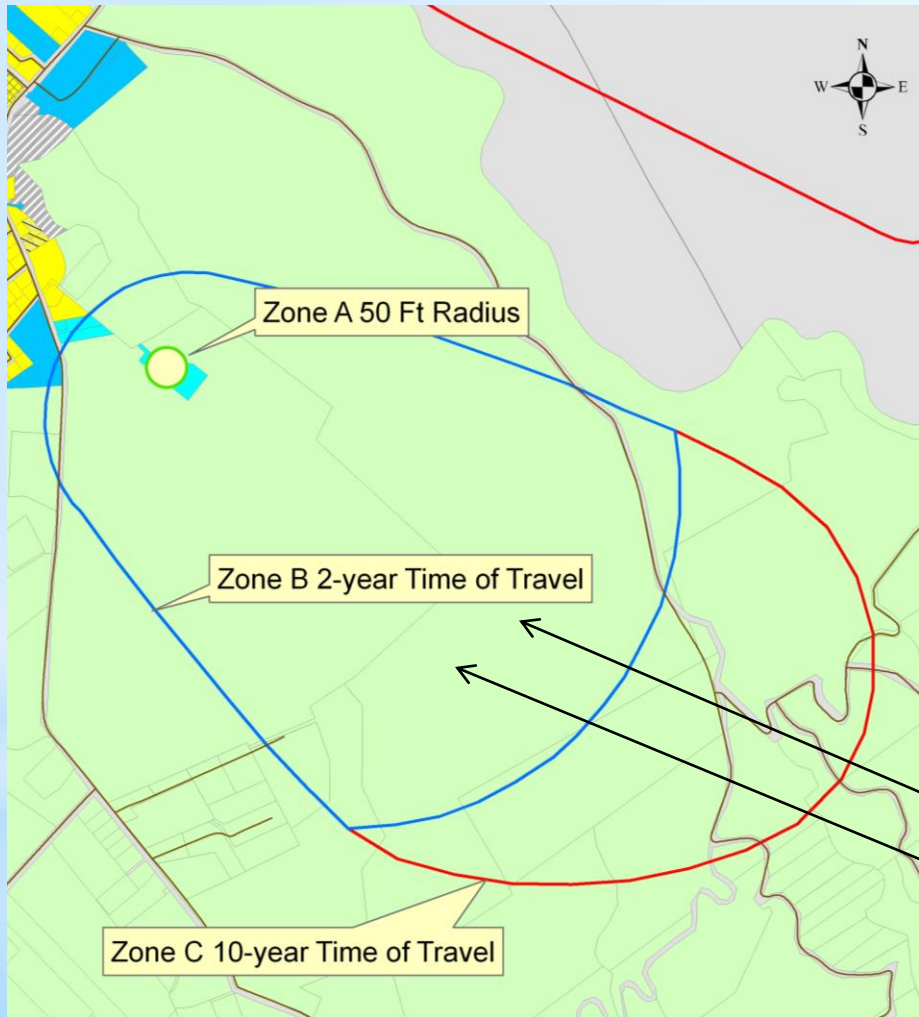
Wellhead Protection Overlay District

- ✓ Zoning - restrict NEW high risk uses
- ✓ Administrative permit with best management practices
- ✓ Existing uses grandfathered in
- ✓ Supplement, not duplicate regulations in place
- ✓ Modeled upon EPA overlay zoning standard, community input, Dept of Planning/Zoning Administration

PROHIBITED NEW HIGH RISK USES:

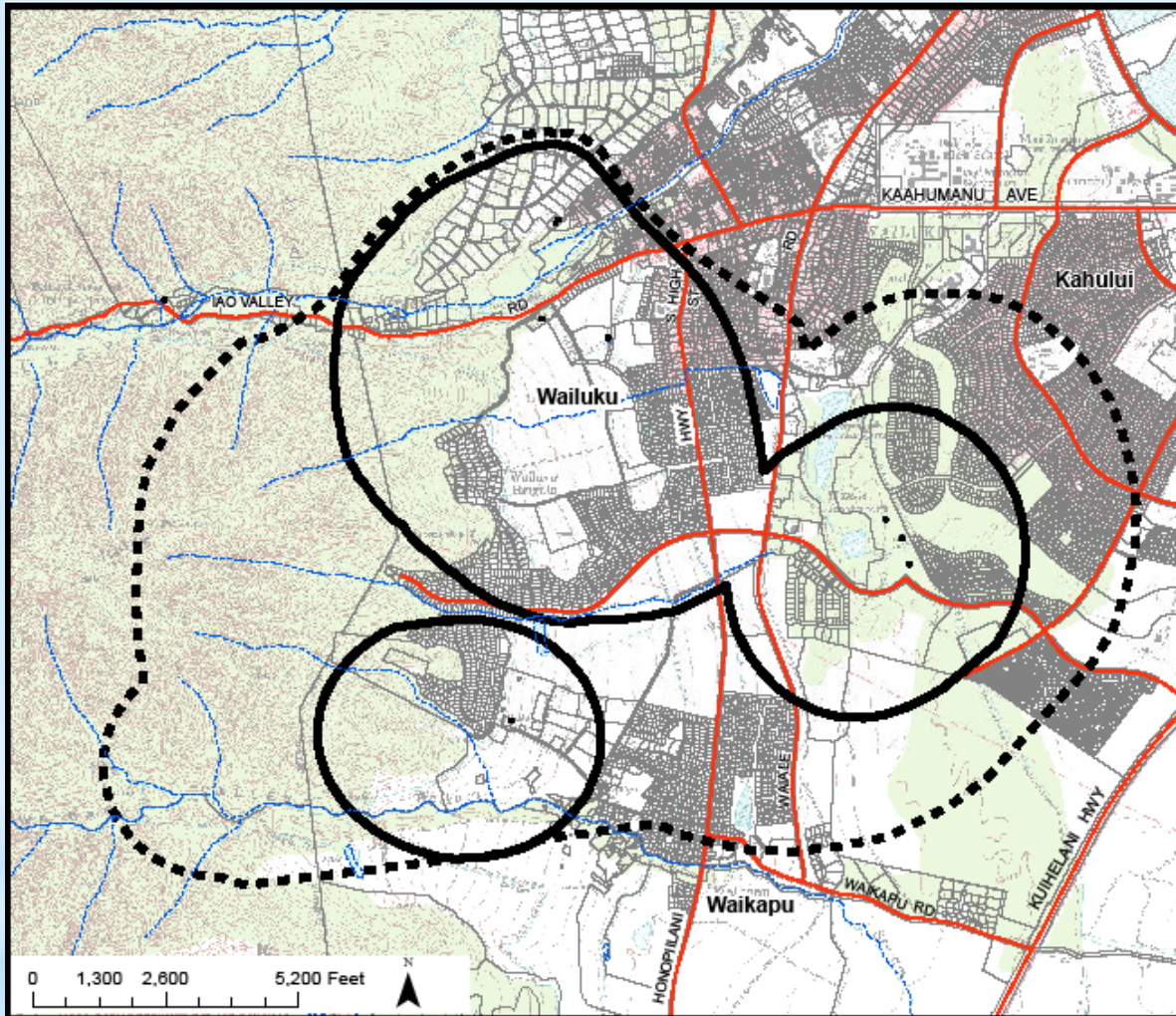
- Cesspools
- Commercial electrical/electronic manufacturing facilities
- Commercial chemical processing/ storage facilities
- Mortuaries/graveyards
- Golf courses
- Commercial metal plating/finishing/fabricating facilities
- Plastics/synthetic production facilities
- Commercial junk/scrap/salvage yards
- Mines
- Landfills
- Injection wells on non residential properties
- Irrigation with R2/R3 reclaimed water
- Sewage sludge land applications
- Commercial slaughterhouses
- Wastewater percolation ponds

Wellhead Protection Overlay District



- New landfill - **NO**
- New agricultural supply storage: **YES** - with best management practices

Wellhead Protection Overlay District - Central Maui



LEGEND

- WPOD ZONE A
- WPOD ZONE B - 2 year
- ⋯ WPOD ZONE C - 10 year
- 2013 PARCEL



NOTE:

WPOD zones were delineated by the University of Hawaii Department of Geology & Geophysics utilizing fixed distance for the ZONE A nearest the well and Time of Travel (TOT) criteria for Zones B and C using the USGS 3-dimensional numerical groundwater model, MODFLOW, followed by the particle tracking program, MODPATH.

ZONE A - Direct chemical contamination zone.
A 50-foot radius around each well to provide protection from vandalism, tampering, or other threats to each well site.

ZONE B - Indirect microbial contamination zone.
Consists of the surface area overlying the portion of the aquifer that contributes water to the well within a 2-year time-of-travel distance.

ZONE C - Indirect chemical contamination zone.
Consists of the surface area overlying the portion of an aquifer that contributes water to the well within a 10-year time-of-travel distance.

OFFICE OF THE COUNTY CLERK
200 SO. HIGH ST., WAILUKU, MAUI, HAWAII 96793

WELLHEAD PROTECTION OVERLAY DISTRICT MAP No. 5 IAO STREAM TO WAIKAPU, MAUI

APPROVED:	PUBLIC HEARING: _____
COUNTY CLERK	ADOPTED BY COUNCIL: _____
DATE	ADOPTED BY MAYOR: _____
APPROVED:	BILL No./YEAR _____
PLANNING DIRECTOR	ORDINANCE No. _____
DATE	

DRAFT 04 WPOD Map **5**

- No impact on Residential development in sewerred areas (3 lots or more: Design Guidelines)
- <1% land zoned Light Industrial

Community and Board of Water Supply Concerns

- | | |
|---|--|
| 1. Delineation/Model acceptable level/peer review? | 1. USGS modeling codes, among the most widely reviewed codes available to simulate groundwater flow and define well capture zones. EPA contracted peer review |
| 2. Impact on property values? | 2. Programs not shown to deflate property values or interfere with business and economic development in a community |
| 3. Legal challenges/takings? | 3. Overlay zoning to protect groundwater a well accepted method. Delineation defensible |
| 4. Cost to community/customers? | 4. Grant funded program development. Existing staff absorb permit administration |
| 5. Justifiable need? No historical examples showing failures of current regulations | 5. “More groundwater specific protection is needed to address gaps” - <i>State Director of Health</i> <ul style="list-style-type: none">- Kunia, Superfund site (10’s of \$M)- Red Hill- Sand Island |

Best Management Practices

Permit operations with mitigating measures



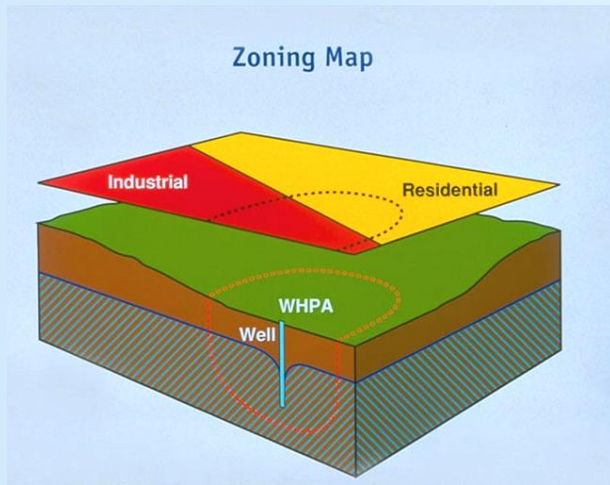
- Impervious surface with a *secondary containment*

Incentives for Business Owner:

- *Reduce potential spill clean up costs*
- *Reduce environmental liability*
- *Increase employee safety*



Comprehensive Wellhead Protection Strategy



Wellhead Protection Overlay Zoning: Best Management Practices

Restrict new high risk uses in wellhead protection areas

Public education

Well siting

- *Assessment preceding site selection*
- *Preference to sites of low vulnerability*

- 70% of Maui's drinking water supply is groundwater
- Current laws and regulations leave gaps in protecting wells
- Prevention always less expensive than treatment

By Water All Things Find Life