Maui County Department of Water Supply

Wellhead Protection Through Zoning in Maui County

4th Joint Government Water Conference
August 7, 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

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

<table>
<thead>
<tr>
<th>Treatment Technology</th>
<th>Estimated Unit Cost $/1,000 gallons treated</th>
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<tbody>
<tr>
<td>Granular Activated Carbon (VOCs)</td>
<td>$0.32 - $1.47*</td>
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<tr>
<td>Reverse Osmosis (Nitrate)</td>
<td>$1.19 - $2.1</td>
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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 A**: 50 ft Setback
- **Zone B**: 2 years - time of travel
- **Zone C**: 10 years - 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
- No impact on Residential development in sewered areas (4 lots or more: Design Guidelines)
- <1% land zoned Light Industrial
## Community and Board of Water Supply Concerns

1. **Delineation/Model acceptable level/peer review?**
   - USGS modeling codes, among the most widely reviewed codes available to simulate groundwater flow, define well capture zones. EPA contracted peer review. 3D numerical GW model MODFLOW & particle tracking program MODPATH

2. **Impact on property values?**
   - Programs not shown to deflate property values or interfere with business and economic development in a community

3. **Legal challenges/takings?**
   - Overlay zoning to protect groundwater a well accepted method. Delineation defensible

4. **Cost to community/customers?**
   - Grant funded program development. Existing staff absorb permit administration

5. **Justifiable need? No historical examples showing failures of current regulations**
   - “More groundwater specific protection is needed to address gaps” - *State Director of Health*
   - 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: 
*Restrict new high risk uses in wellhead protection areas*

Best Management Practices
*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*
Review Process for County of Maui Adoption

- County of Maui (CoM) DWS develops draft WPOD ordinance with input from CoM Planning Department and Corp. Counsel, HDOH, HDOA, UH, Public Outreach
- CoM Board of Water (BWS) Supply initial review
- Maui County Council Water Resources Committee (WRC) initial review
- CoM Planning Commissions + BWS 2\textsuperscript{nd} review
- Maui County Council WRC 2\textsuperscript{nd} review
- Maui County Council 1\textsuperscript{st} Reading
- Maui County Council 2\textsuperscript{nd} Reading

$\rightarrow$ WPOD Ordinance to be adopted as part of Title 19 County Code
Referenced Laws and Regulations

- Relevant definitions under Maui County Code
  - Title 19, Title 14.

- *Pesticides of Concern* identified by State of Hawaii under US EPA Pesticides of Interest Tracking System (POINTS) as posing significant risk of contamination in geographically sensitive areas.
  - Pesticides of concern identified from State Issues Research and Evaluation Group (SFIREG) under Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
  - Pesticides of concern identified as specific causes of water quality impairments under U.S. EPA Clean Water Act (CWA) § 303(d).
• *Irrigation of crops:*
  o USDA NRCS Conservation Practice Standards on Integrated Pest Management Code 595 and on Irrigation Water Management Code 449, as may be amended.

• *Regulated Substances:*
  o US EPA National Primary Drinking Water Regulations
  o Rules Relating to Public Water Systems pursuant to Hawaii Administrative Rules Title 11, Chapter 20.