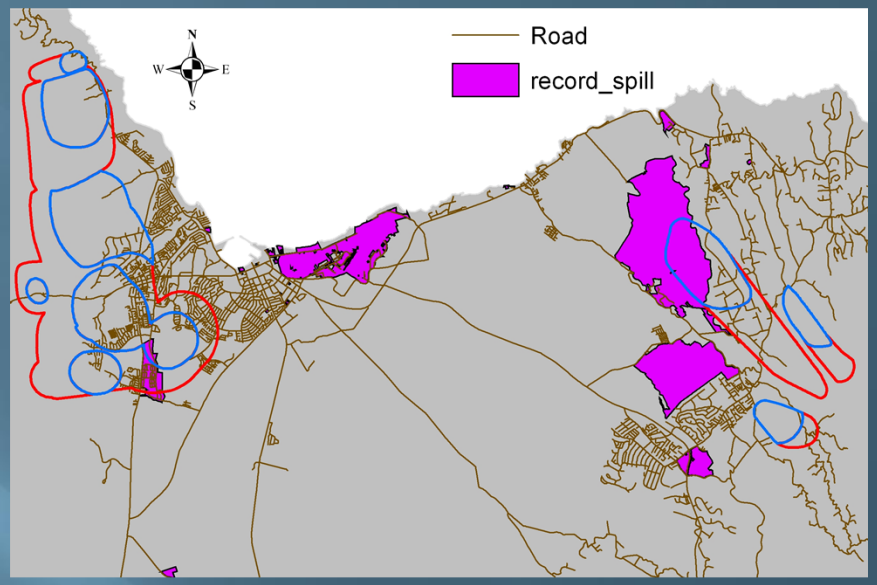
Best Management Practices for Groundwater Protection in Maui County

Maui County Department of Water Supply

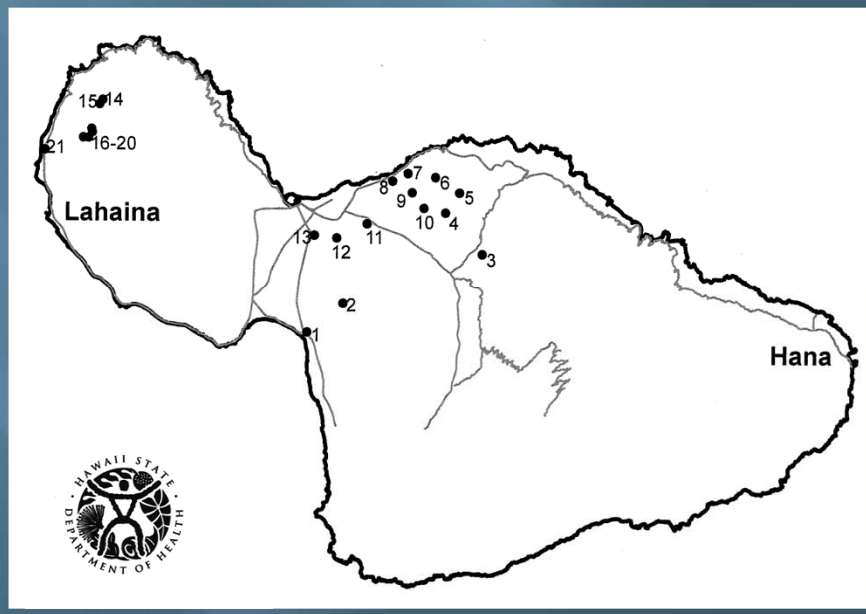
Land Use & Groundwater

70% of Maui's drinking water is groundwater. Leaks or spills onto soils from common land use activities can seep into groundwater



VERY HIGH RISK

- Hazardous waste generators
- Gas stations
- Chemical/petroleum processing/storage
- Dry cleaners/processing
- Metal plating/finishing/fabricating
- Plastics/synthetic fabricators
- Pesticides/herbicides mixing and loading sites
- Airports – maintenance fueling areas
- Landfills/dumps/historic dumps
- Cesspools – High density >1/acre
- Wastewater treatment plants
- Injection wells/dry wells/sumps
- Military installations
- Leaking underground storage tanks
- Confined animal feeding facilities
- Pineapple cultivation
- Sugar cane cultivation
- Improperly abandoned wells
- Wood treatment facilities
- Power plants
- Illegal activities/unauthorized dumping
- Crops using soil fumigants
- Underground injection of commercial/industrial
- discharges



1-2-3-TRICHLOROPROPANE
1-2-DIBROMO-3-CHLOROPROPANE
ARSENIC
ATRAZINE
BARIUM
BENZO-A-PYRENE
CALCIUM
CHROMIUM
COLIFORM -TCR-
COMBINED RADIUM --226 - -228-
DALAPON
DI-N-BUTYL PHTHALATE
ETHYLENE DIBROMIDE
FLUORIDE
GROSS ALPHA- EXCL- RADON - U
NICKEL
NITRATE
NITRATE-NITRITE
RADIUM-226
SULFATE

Best Management Practices

Preventive measures provide more cost-effective solutions for maintaining water quality than implementing treatment or finding an alternative source for reliable and safe drinking water.

- **Store potentially contaminating substances on an impervious surface with a secondary containment**
- **Secure storage areas against unauthorized entry**
- **Label containers clearly and inspect storage areas regularly**
- **Keep spill control and containment readily available**

- **Reduced environmental liability**
- **Minimizes potential cleanup costs**
- **DWS financial incentives**

Source Protection Financial Incentives

DWS provides financial and technical assistance to retrofit or upgrade potentially contaminating operations within capture zones of DWS wells

Used Oil Recycling and Disposal
Contract a licensed Used Oil Recycler to test for contamination by chlorinated solvents and haul away for disposal.

Used Automotive Battery Recycling and Disposal
Instruct business owners on proper battery recycling and disposal practices and direct them to licensed battery recycling businesses. Collect and deliver plastic-cased batteries to a licensed recycler.

Abandoned Vehicles
Remove as many derelict and abandoned vehicles as possible capture zones through partnership with Maui County's Solid Waste Division's Abandoned Vehicles Program.

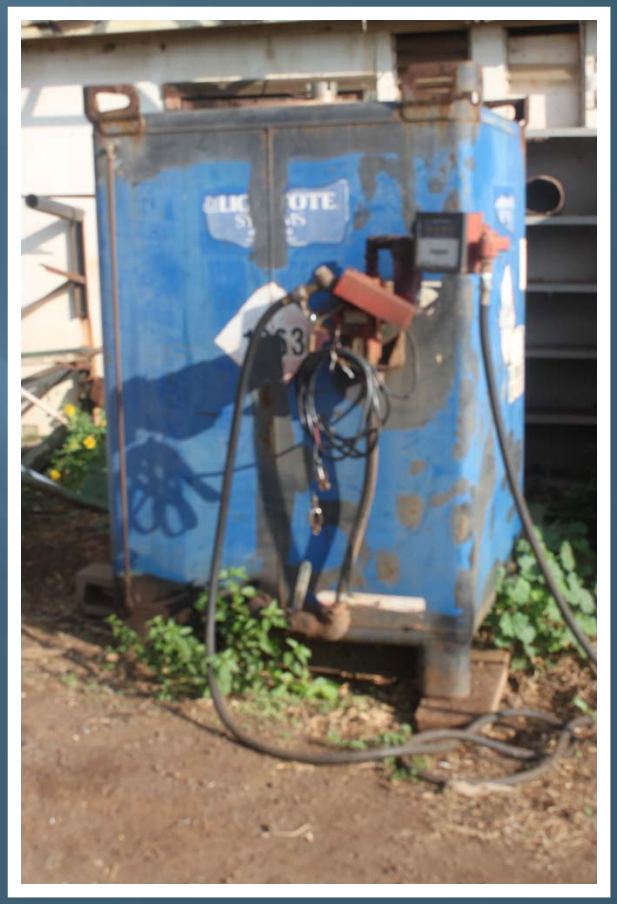
Source Protection Financial Incentives

Improper Agricultural Chemical Storage
Licensed contractor to lay a cement/concrete. Business owner to implement proper chemical storage BMPs

Leaking Gasoline Tank and Pump
Licensed contractor to lay a cement/concrete pad for the area beneath the current gasoline pumping and above-ground storage tank.

Incentives for Business Owner:

- *Cost-free Facilities Upgrade*
- *Increased employee safety*
- *Reduction of potential spill clean up costs*



Source Protection Financial Incentives

Cesspool Remediation Program

Four types of On Site Sewage Disposal Systems (OSDS) systems are defined by the State Department of Health;

- *Class I systems: any system receiving soil treatment with disposal through bed, trench or infiltration/chambers)*
- *Class II: septic systems discharging to a seepage pit*
- *Class III: aerobic units discharging to a seepage pit*
- *Class IV: cesspools*

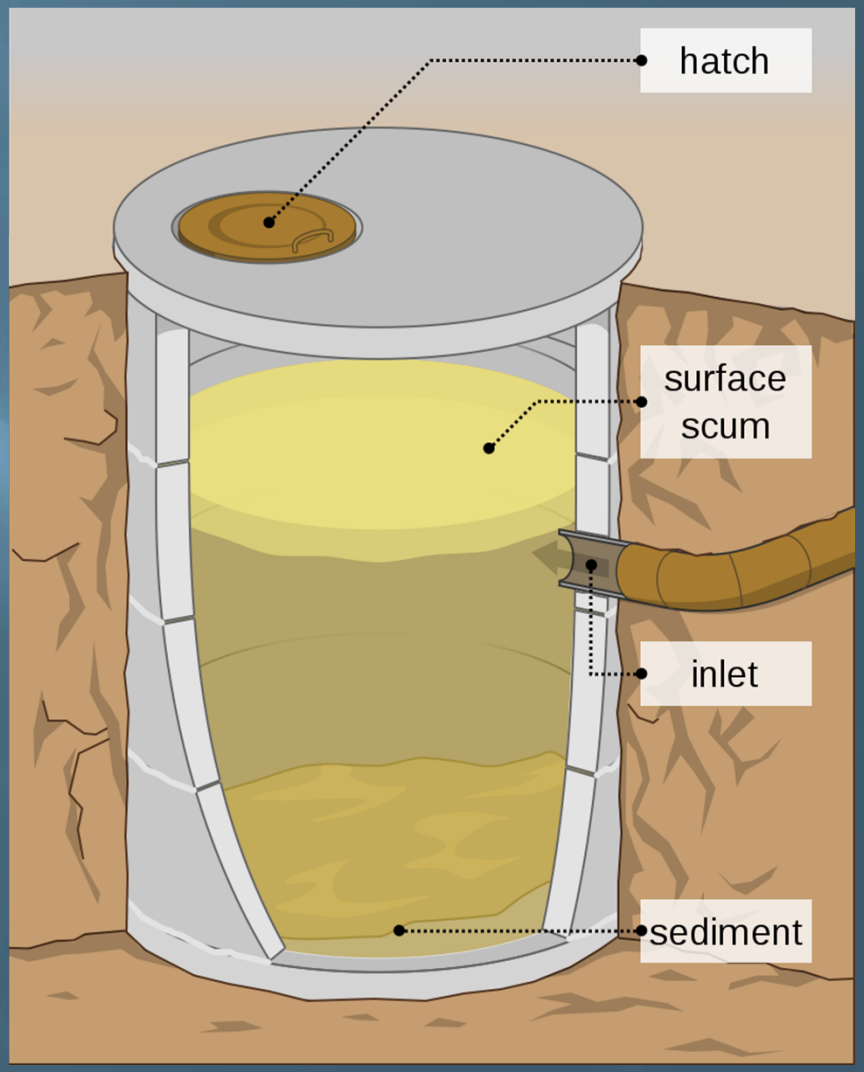
Cesspools account for 77 percent of released sewage effluent in Oahu study, the majority reaching the groundwater.

Pathogens:
Concern within the 2-year time of travel zone

Nitrate:
96 % of the OSDS nitrogen released coming from cesspool.

Typical nitrogen concentration in cesspool effluent is twice the concentration compared to OSDSs that receive some treatment.

Upgrade cesspools within the capture zones to reduce the contaminant load to the county water system.



Source Protection Easement

- *A Source Protection Easement is a voluntary agreement between a landowner and an agency or land trust that restricts future activities on the land to protect the underlying aquifer*
- *A Source Protection Easement is tailored to the specific parcel, land owner's current and planned uses and source protection targets*
- *A Source Protection Easement allows landowners to continue to own and use their land and to sell it or pass it on to heirs, while giving up some of the rights associated with the land*

QUALIFIERS:

- *Critical underlying aquifer?*
- *Current and future water services?*
- *Current or historic contamination?*
- *Large scale agriculture, urban development or potentially contaminating activities?*
- *Development plans?*
- *Other natural resource values?*

Public Education: Why bother?

Contamination :

Treatment
Monitoring
Alternate water supplies
Remediation
Litigation

Prevention:

Simpler
Less expensive
More reliable over long term

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

Best Management Practices - Home

- Apartments and Condominiums
- Household Hazardous Product Use and Waste
- Used Motor Oil
- Landscaping
- Private Wells
- Septic Tanks

Do's and Don'ts

Do...

Use non-toxic and less-toxic alternatives to household chemicals.
•Follow package directions on pesticides, fertilizers, and other household chemicals Home mechanics can drop of their used oil at no charge at oil recycling collection sites.
•Practice good housekeeping in automobile / shop maintenance areas.
•Pick up spills with absorbent material and dispose of properly.
•Have your septic tank inspected and pumped out regularly.
•Be alert to signs of a failing septic system such as the presence of wet areas above the leaching field and backing up of wastewater following periods of heavy water use.

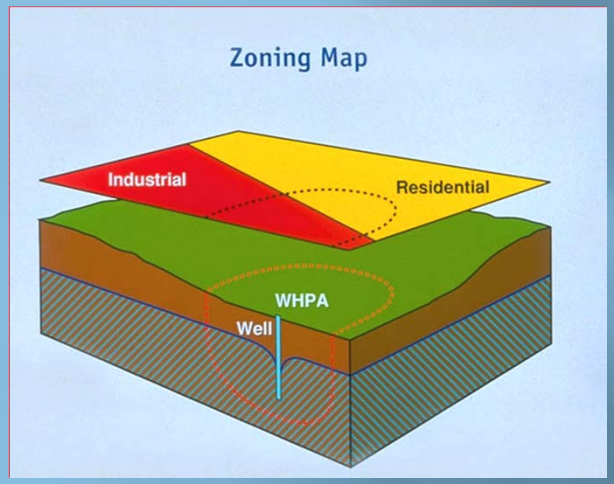
Don't...

Buy more hazardous chemicals than you need.
•Use pesticides, fertilizers, or herbicides near your well.
•Use commercial septic tank cleaners.
•Pour hazardous materials such as paint, degreasers, solvents, industrial cleaners, disinfectants, pesticides, or waste oil down floor drains, sinks or toilets, on your property, or in storm sewers.
•Keep vehicles, livestock, or other heavy objects around your septic leach field and distribution line.

Resources

Additional pollution prevention information is available from the following resources:
Department of Environmental Management
•College of Tropical Agriculture and Human Resources Water Quality Extension

Comprehensive Source Protection Strategy



Wellhead Protection Zoning:
Restrict new high risk uses from locating in wellhead protection areas

Best Management Practices:
- Structural or operational
- Land use agreements & easements
- Public education

Well siting:
- Source water assessment preceding site selection
- Preference to sites of low vulnerability from current and historic PCAs
- Protection at the earliest time possible

www.mauiwater.org