



We work with others to protect the health of the people of Washington State by ensuring safe and reliable drinking water.

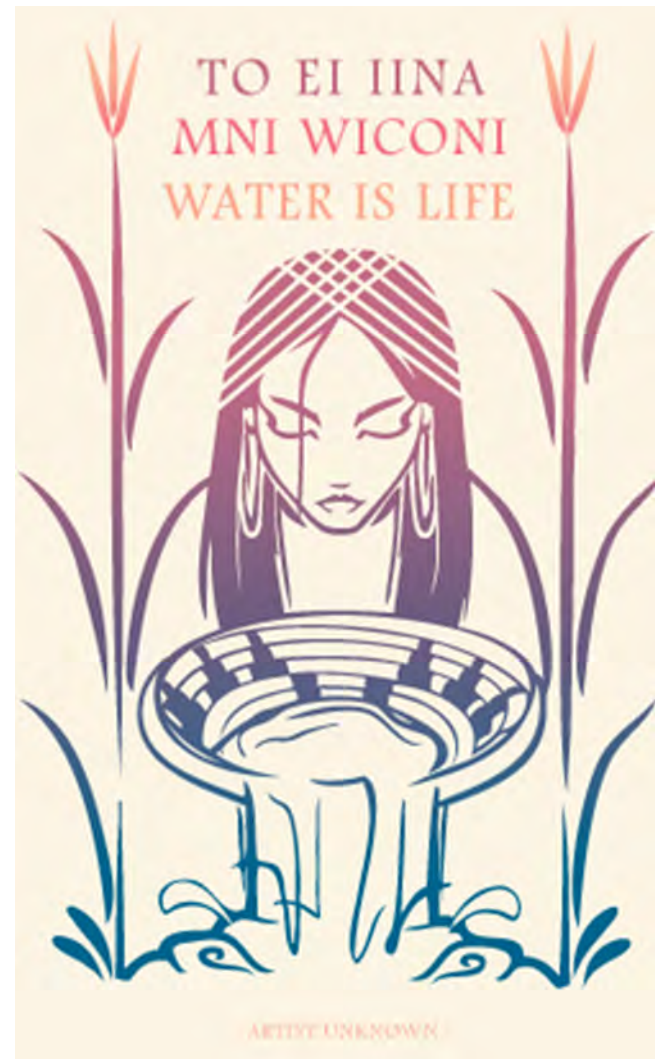


DRINKING WATER SOURCE PROTECTION FUNDING

Washington State Department of Health
Office of Drinking Water


“...the culture and spirituality of the four Columbia River treaty tribes is ***inextricably tied to the water***, that is the support to all life, and to the salmon.”

-Columbia River Inter-Tribal Fish Commission, *emphasis added*



Welcome

- Who are we?
- Who's in the room?
- Do you know where your community gets its water from?
- How much do you know about source water protection?



A G E N D A

1.

- Sync local plans with water system plans
- Good working relationships between local governments & water systems
- Establishing wellhead protection areas (WHPAs) & benefits of upgrading to modeling
- Source water protection funding available from DOH

What Do Local Plans Have to Do with Water?

- Service area land use & zoning (source water protection, ID pressure/lift issues, main sizing)
- Practicality—system growth & capital investments vs. where new growth is planned to occur
- Zoning dictates land use in wellhead protection areas (WHPAs)
 - Many local jurisdictions overlook small systems in planning
- Critical Areas Ordinance—critical aquifer recharge areas (CARAs—relationship with WHPA)

Required Groundwater Planning

- Protecting **quality & quantity** of groundwater used for public water supply
- **Required content in comp plan land-use element**
- 1984—All local jurisdictions statewide
RCW 35.63.090—towns & non-code cities
RCW 35A.63.061(1)—code cities
RCW 36.70.330(1)—counties
- 1990—GMA (RCW 36.70A.070(1))—all fully planning jurisdictions



Local jurisdictions need to know

Water availability

Available level of service

Source water protection needs

Critical Intersection:

Where **Local**

Jurisdictions &

Water Systems Need

to Communicate

Water systems need to know

What kind of development to expect

Where new development will go

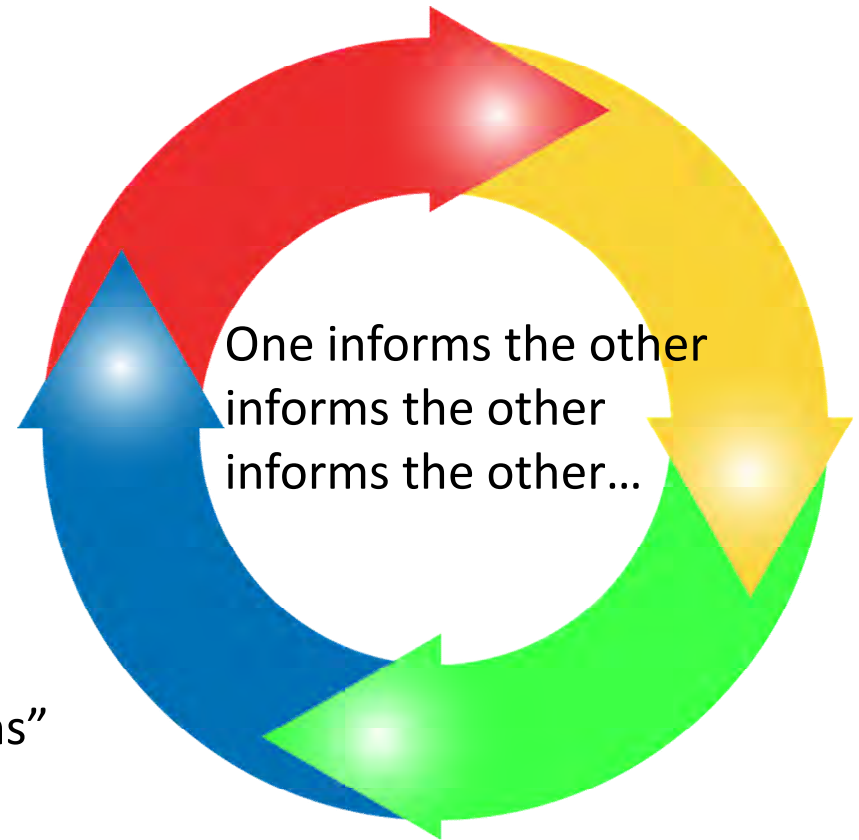
Development proposals in WHPAs

Who's Leading the Charge?

As required



In practice



“Consistency with local plans & regulations”
(WAC 246-290-108)
Water system plan complies with comp plan

What is Source Water Protection, Anyway?

- Actions, not policies
- Preventative, not reactive
- Tailored & planning-based considering such things as geography, surroundings, future growth & land uses, capacity, & emergency response
- Actively maintained (current/updated)
- Bottom line: steps to keep your drinking water clean, reliable and drinkable!

A changing climate

Washington State Integrated Climate Response Strategy

- Increasing demands on water resources
- Increasing water quality degradation
- More frequent and intense droughts and floods
- Excessive water withdrawals, increasing conflicts
- Loss of species, habitats, ecosystems



Images credit: Center for Science of the Earth System, Climate Impacts Group, University of Washington

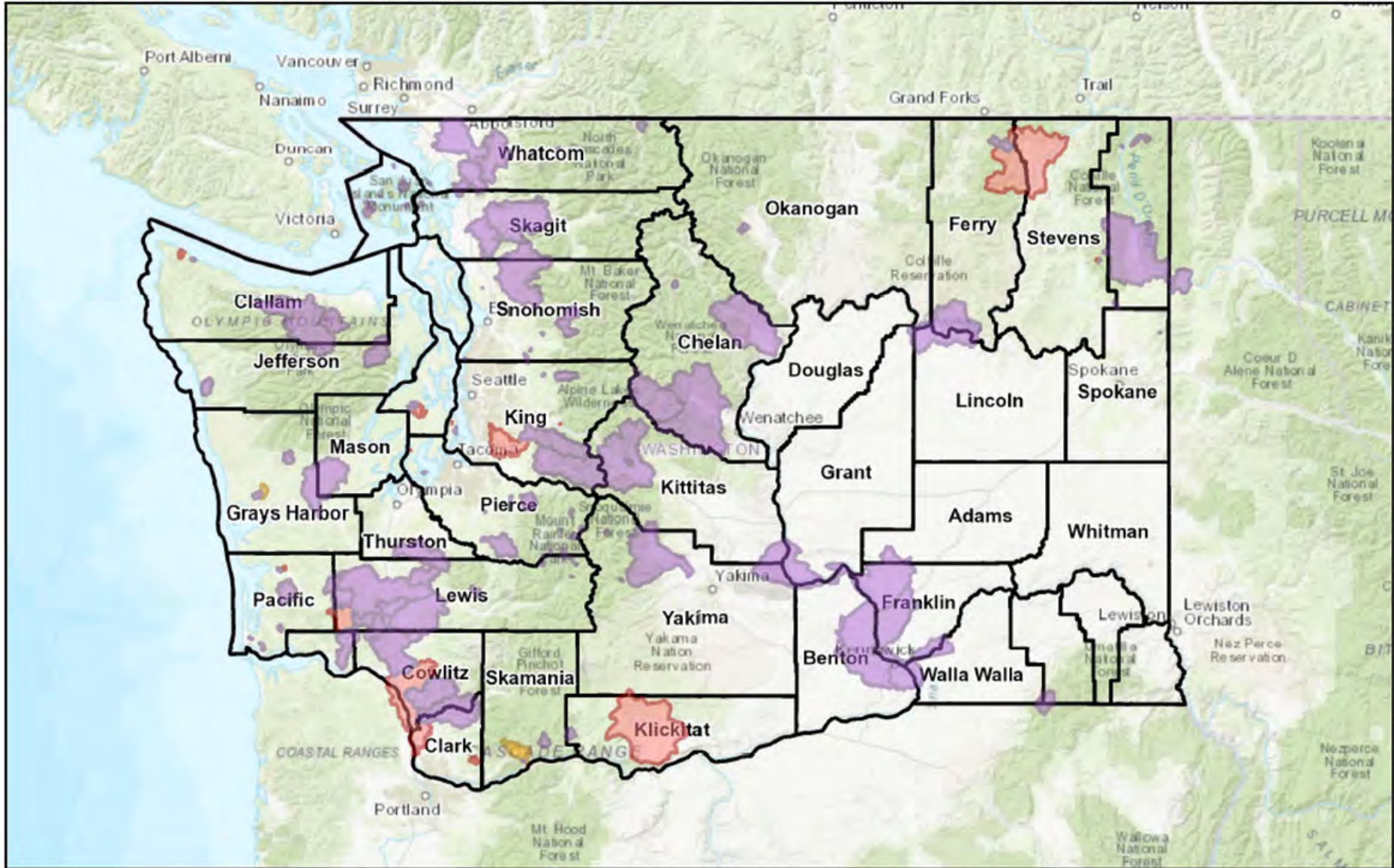
Source Water Protection 101

- 1996 amendments to federal Safe Drinking Water Act
- WAC 246-290-135—sanitary control area, wellhead protection program (wells and springs), watershed control program (surface water/GWI)
- Part of Group A water system plan or small water system management program (WAC 246-290-100 or -105)
- For Group B—within WAC 246-291-125

Surface Water Protection Requirements

- Watershed control plan
 - Watershed description
 - Identification of activities & land uses detrimental to water quality
 - Watershed management & control measures
 - System operation
 - Documentation of water quality trends
- Update as needed (at least with water system plan update)

Surface Water Protection Areas



Contamination is Expensive!

A community may spend millions of dollars responding to contamination.

Responding to contamination is about 200 times more costly than prevention.



Can your community afford it?



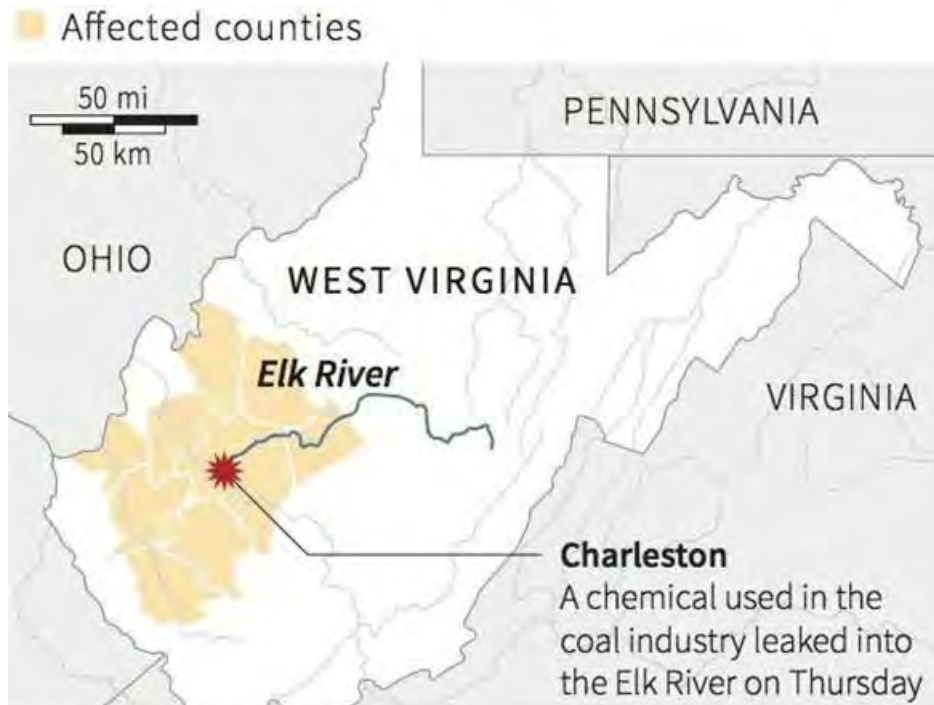
Crude MCHM
(4-methylcyclohexanemethanol)
is chemical foam/wash agent
used in coal processing

**Case Study: Elk
River Spill,
January 2014**

Up to 10,000 gals. of MCHM
combined with PPH (glycol
ethers) leaked onto ground then
transited into the Elk River, 1.5
miles upstream of the West
Virginia American Water intake

- 300,000 customers
- Up to nine-day “do not drink” order

- National Guard engaged to distribute water
- Business, school & public sector closures
- Declared state of emergency
- Replaced all treatment plant filters (\$1.2M)
- Total cost \$70M



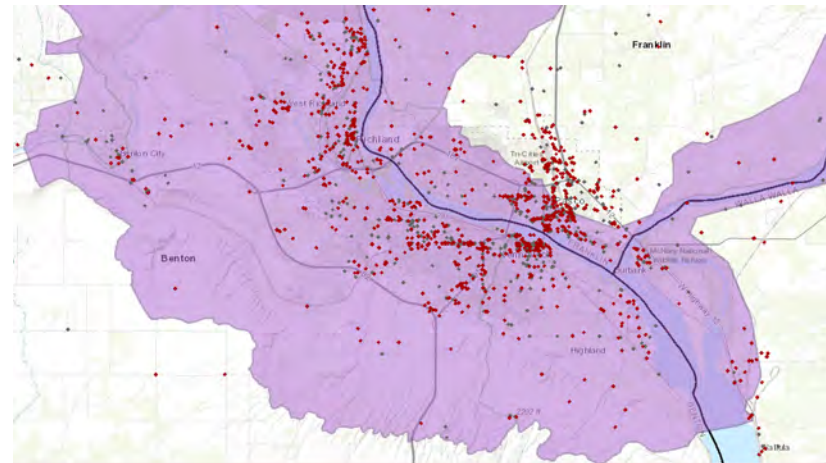
Contamination Leads to Change

As a result, West Virginia lawmakers passed legislation to protect drinking water

- Required planning
- Established an early warning monitoring & response system
 - Baseline monitoring
 - Alternatives for real-time source water monitoring
 - Real-time sensor monitoring system considerations
 - Consequence management
 - Communication planning

Make Your Source Protection Meaningful

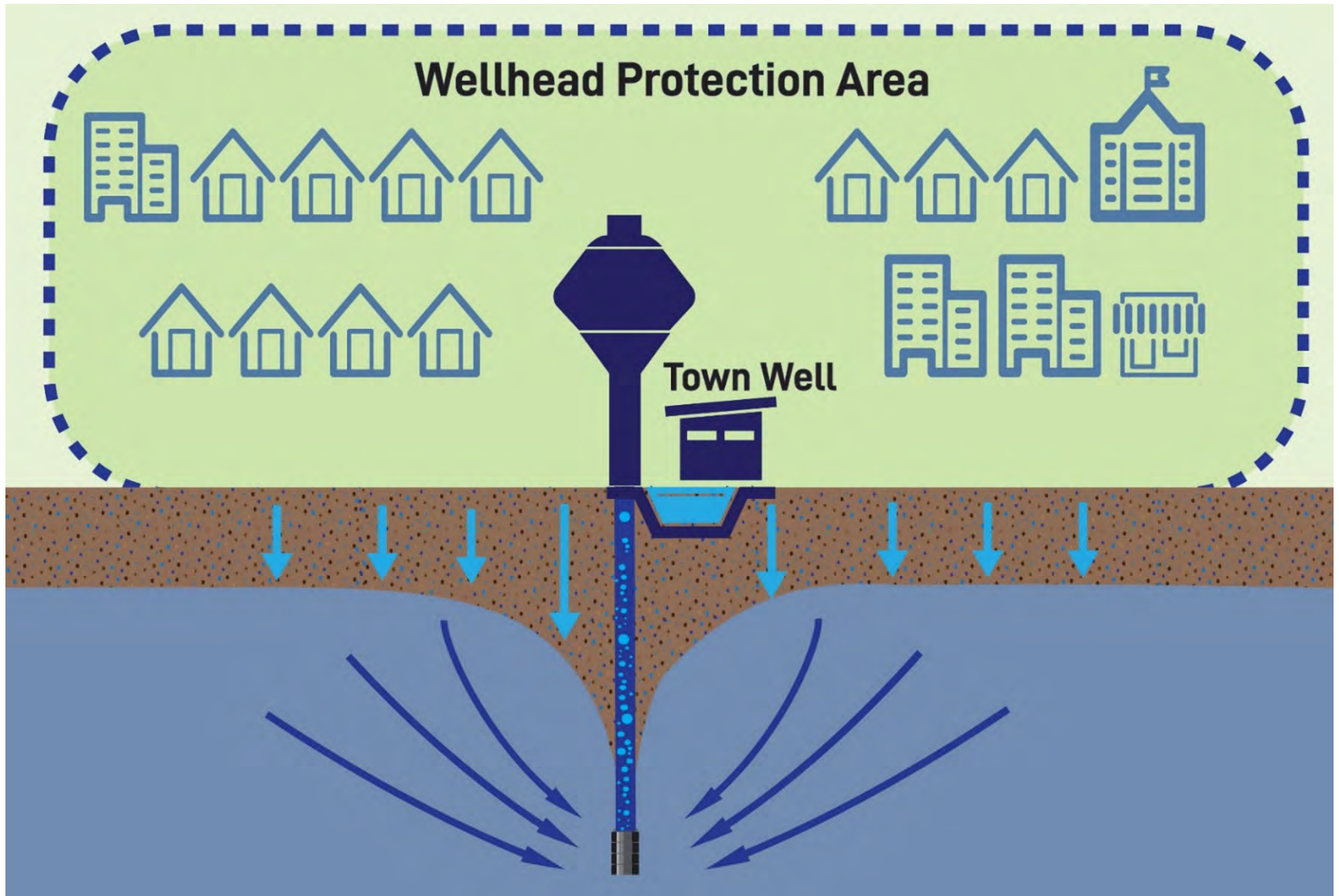
- Watershed control plan
 - Watershed description
 - Identify activities & land uses detrimental to water quality
 - Watershed management and control measures
 - System operation
 - Document water quality trends
- Consider a regional approach
 - Work with other utilities
 - Engage the public
 - Communicate with local government & emergency response agencies



Wellhead Protection Requirements

- Source water susceptibility assessment
- Sanitary control area (SCA)
- Wellhead protection program
 - Define & map WHPAs
 - Inventory of potential contamination sources
 - Notify others of findings
 - Contingency planning
 - Coordination with local emergency responders
- Repeat inventory & notification **every two years**
- Update as needed (at least with water system plan update)






What are Wellhead Protection Areas?

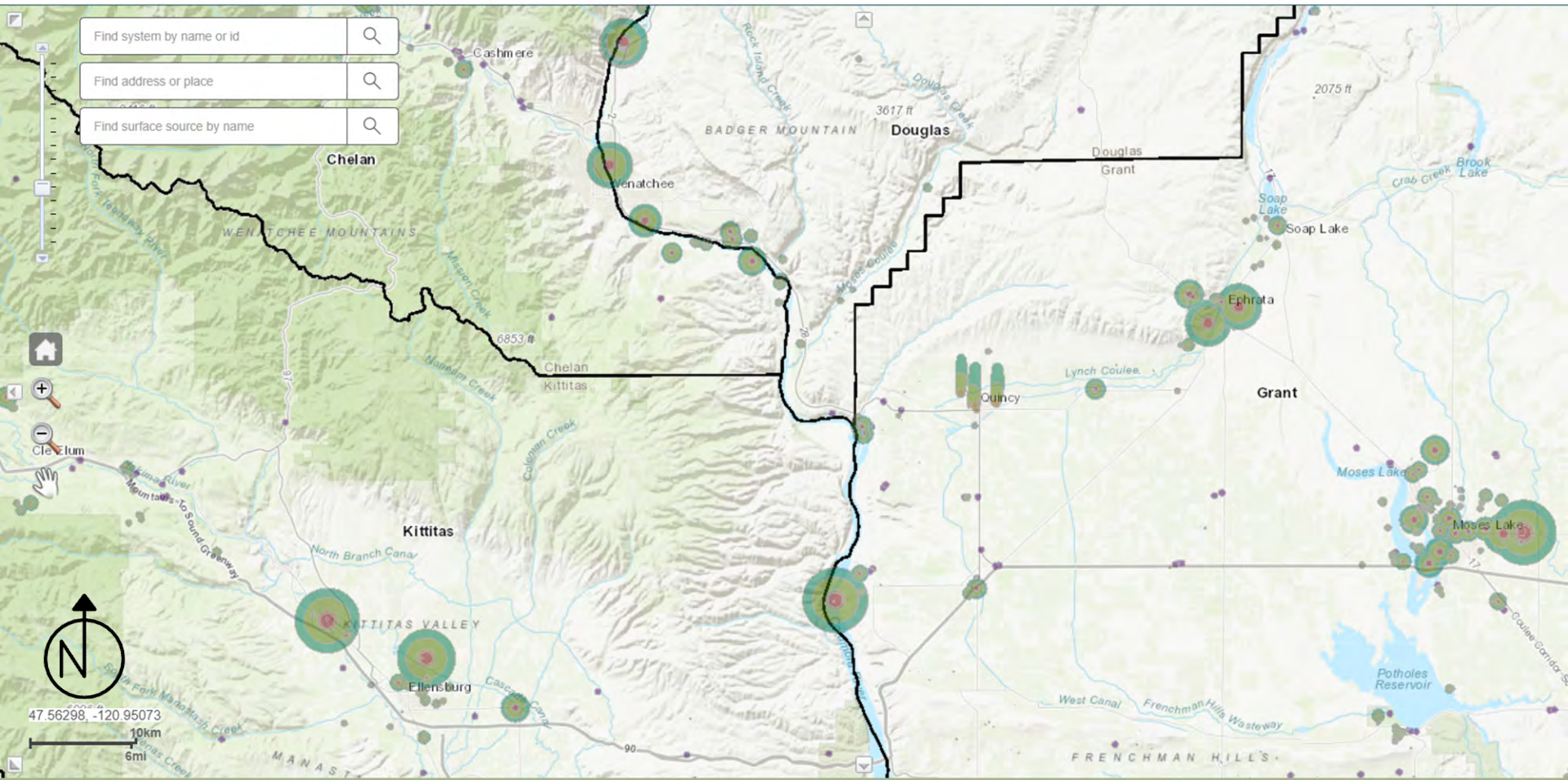


Defining Wellhead Protection Areas

- What are the methods?
 - Modeled
 - Calculated Fixed Radius
- How do you decide the best method?
 - Landscape
 - Source susceptibility
 - Available data
 - Cost

Methods

Modeling Approach			
Calculated Fixed Radius (CFR)	Analytical Models	Hydrogeologic Mapping	Numerical Flow/Transport Models
			
<p>The calculated fixed radius method draws a circular protection area for each protective zone. This delineation method is inexpensive and requires minimal technical expertise.</p>	<p>Analytical methods use simple calculations, graphical methods, or simple analytical solution based computerized groundwater-flow models to delineate wellhead protection zones. This method can provide reasonable approximation of capture zones for simple groundwater systems, and it is relatively inexpensive.</p>	<p>Hydrogeologic maps rely on geologic maps, aquifer water level mapping, aquifer pumping test data, hydrogeological reports and well reports. This method can be highly accurate, good for settings where nearby geologic features strongly control groundwater flow patterns, and it is typically much less expensive than numerical modeling.</p>	<p>Numerical flow/transport methods use two and three dimensional computer models that approximate groundwater flow. This method is highly accurate, can be used in all groundwater settings, and can be used for other purposes (such as groundwater management).</p>
 <p>Increasing reliability, complexity, and cost.</p>			



Source Water Assessment Program (SWAP) Map
fortress.wa.gov/doh/swap/index



Assigned

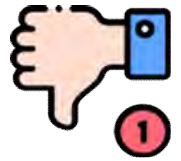
Purple—Group A

1,000' radius

“Better than nothing”

Often emergency/seasonal

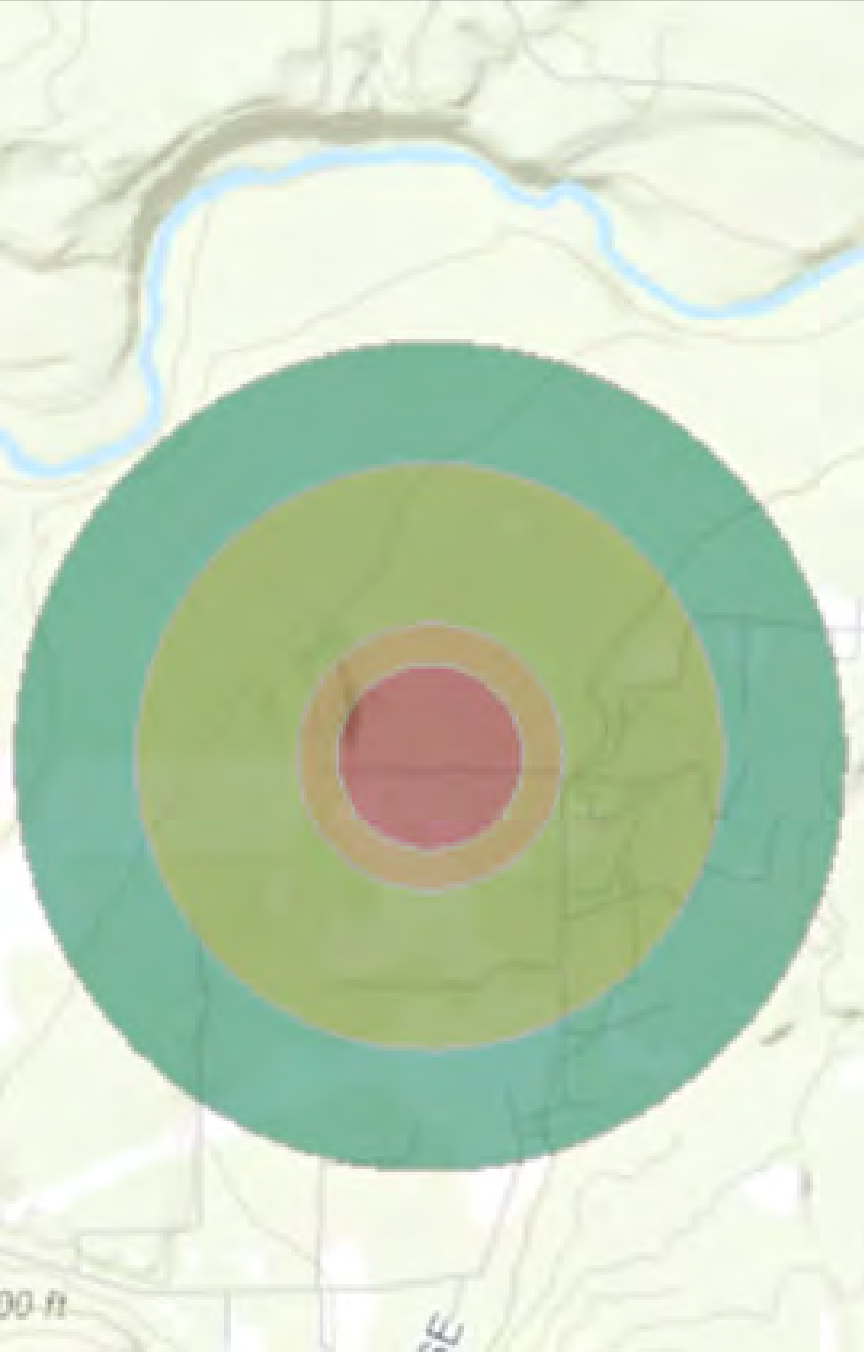
Doesn't meet minimum standard



Gray—Group B

600' radius





Calculated Fixed Radius (CFR)

Most common



Red—6-month TOT

Orange—1-year TOT

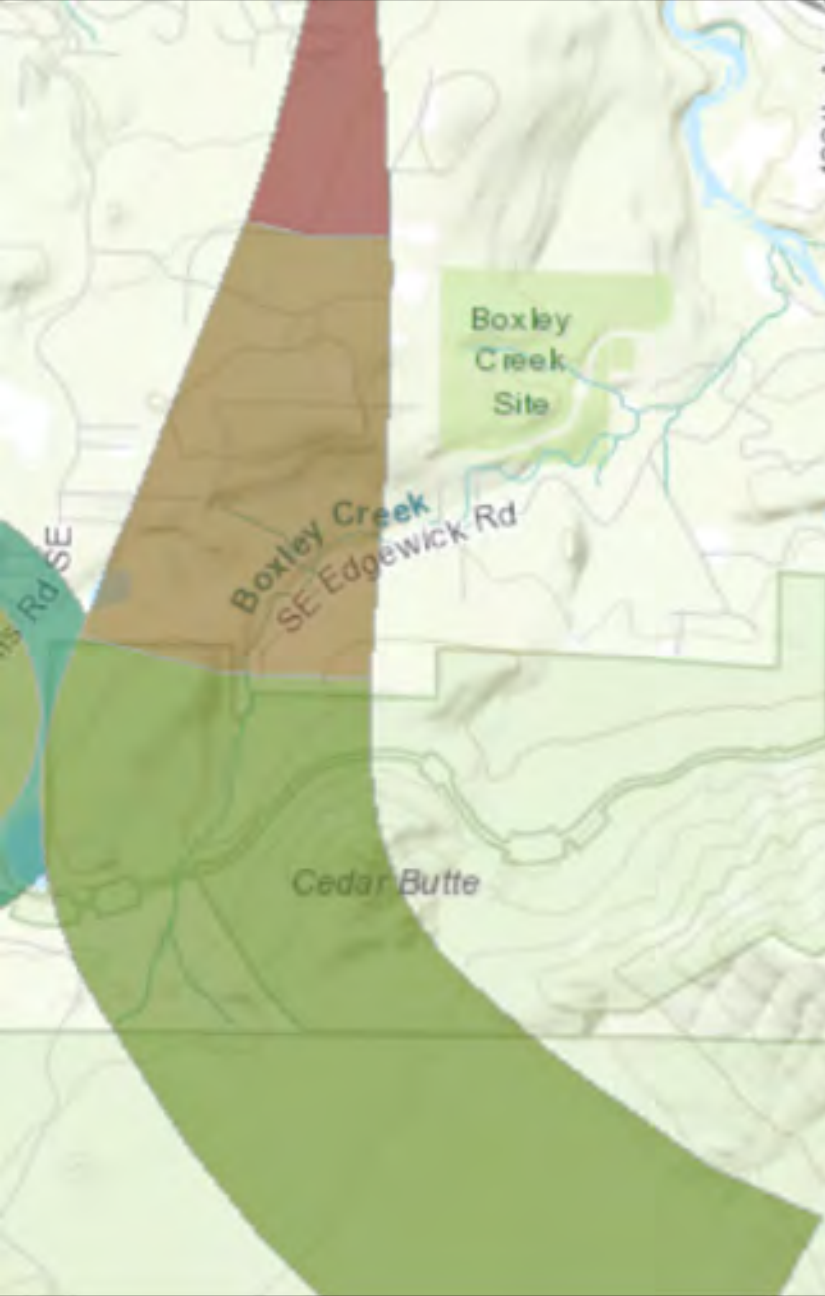
Green—5-year TOT

Teal—10-year TOT

Always a bullseye

Math formula using
operational characteristics

Theoretical approach; doesn't
consider topography, soils,
groundwater flow, etc.



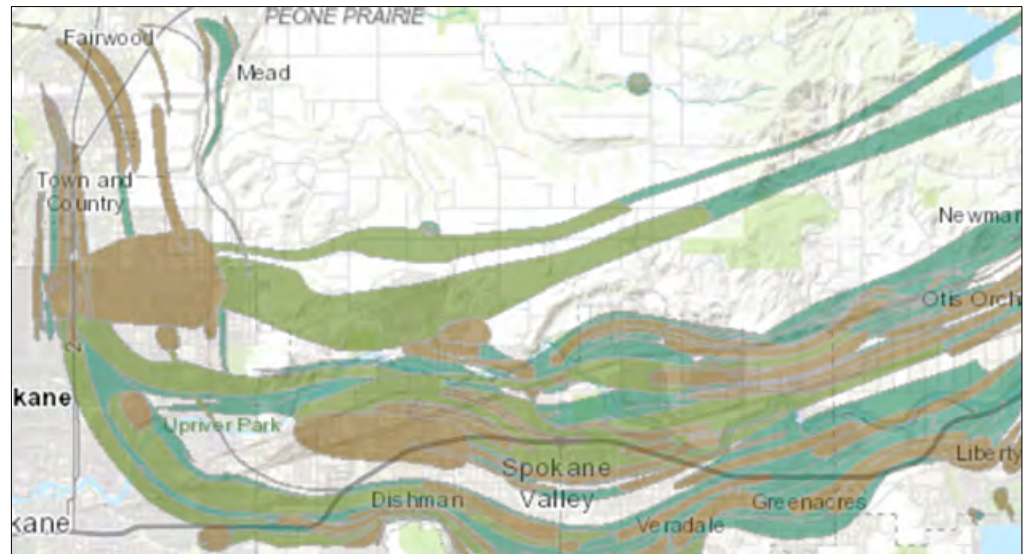
Modeled



Irregularly shaped

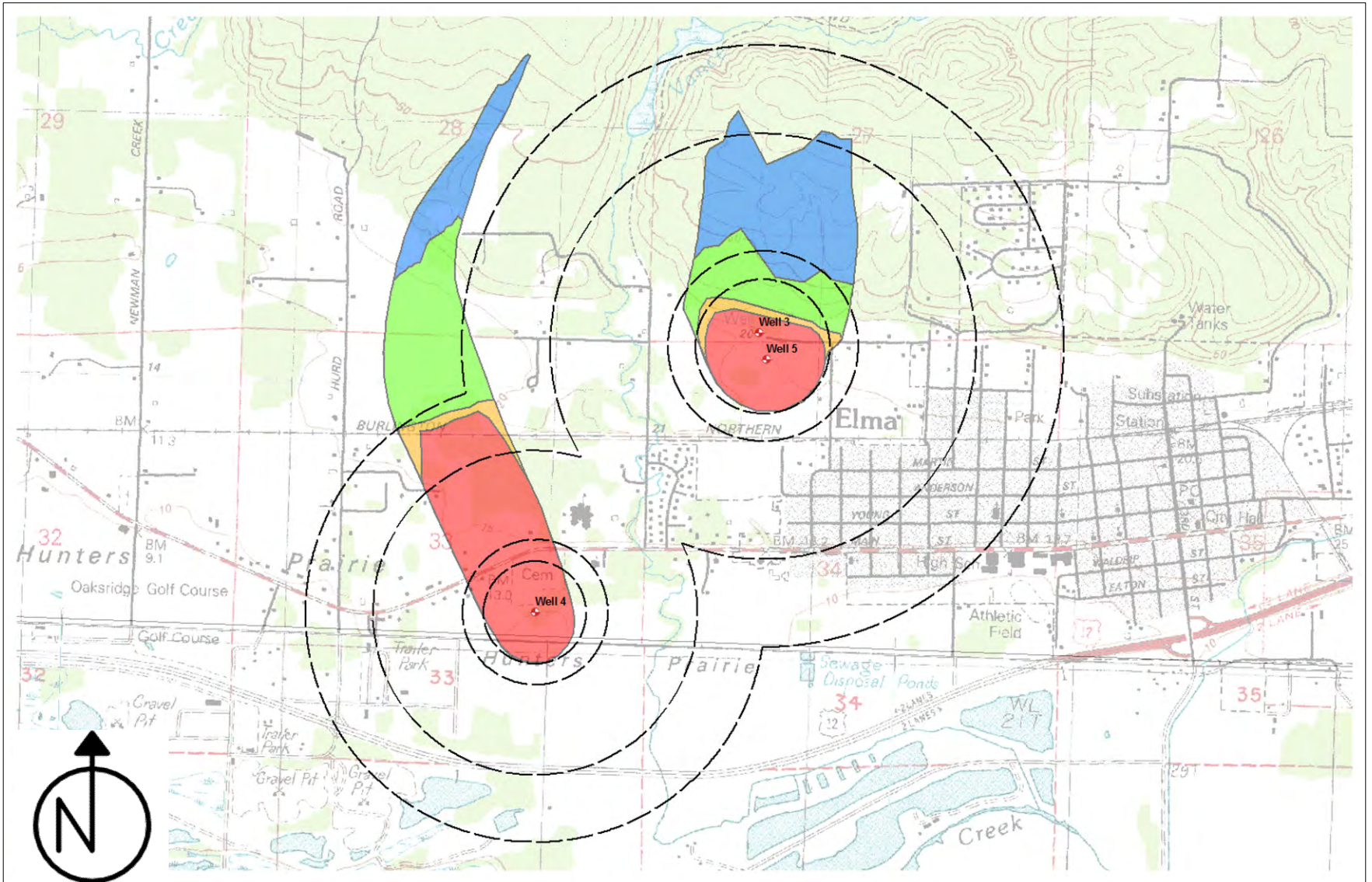
Considers physical land & water features

In practice, best means of protecting source water

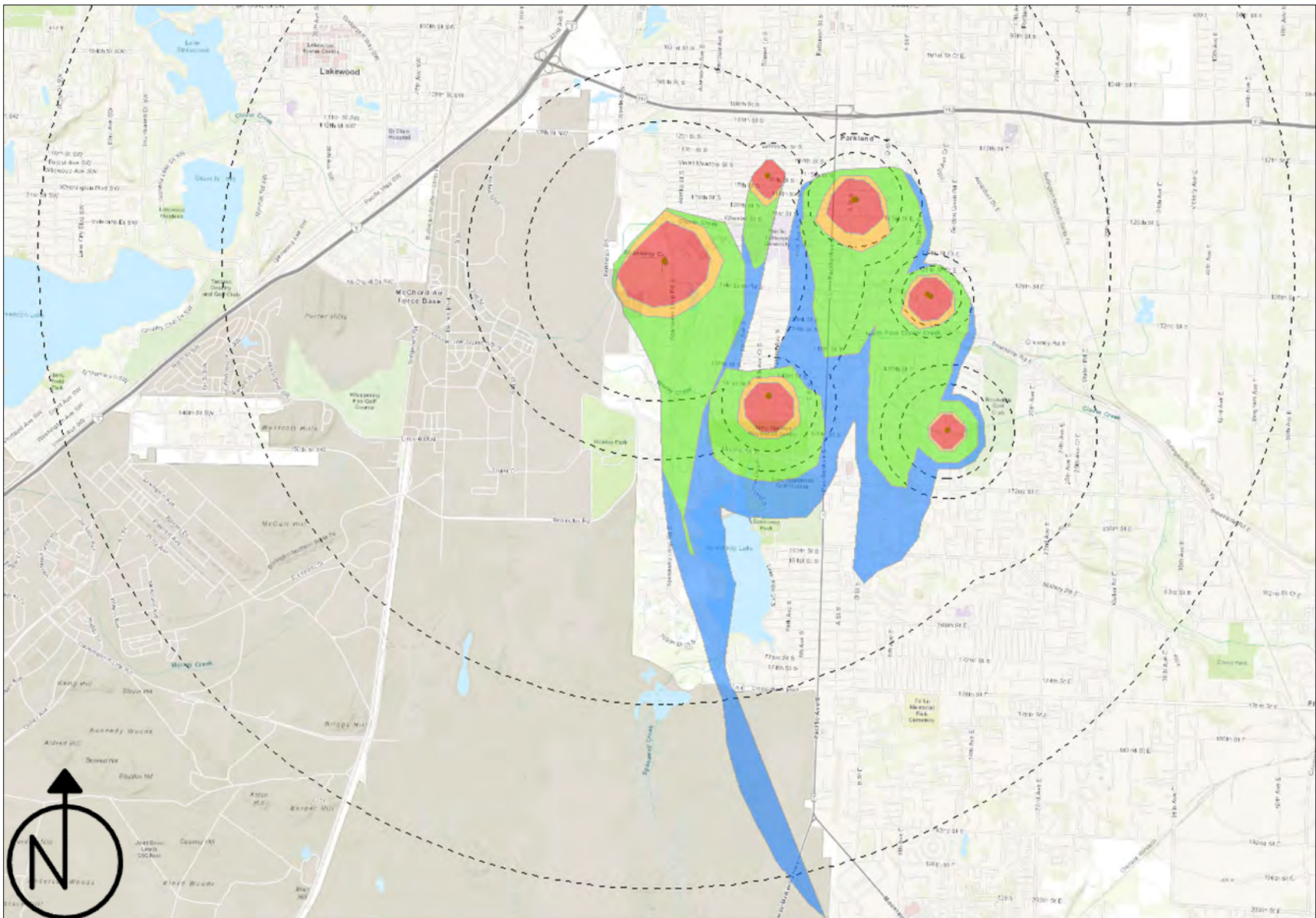


Case Studies

Water Purveyor	Current Method vs.	Modeled Method
Toppenish	CFR	Analytical
Elma	CFR	Hydro-geologic
Parkland Power & Light	CFR	Numerical



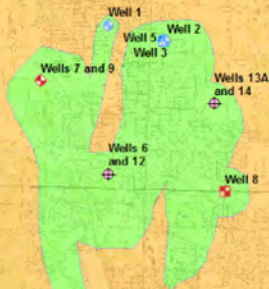
Elma



Parkland Power & Light

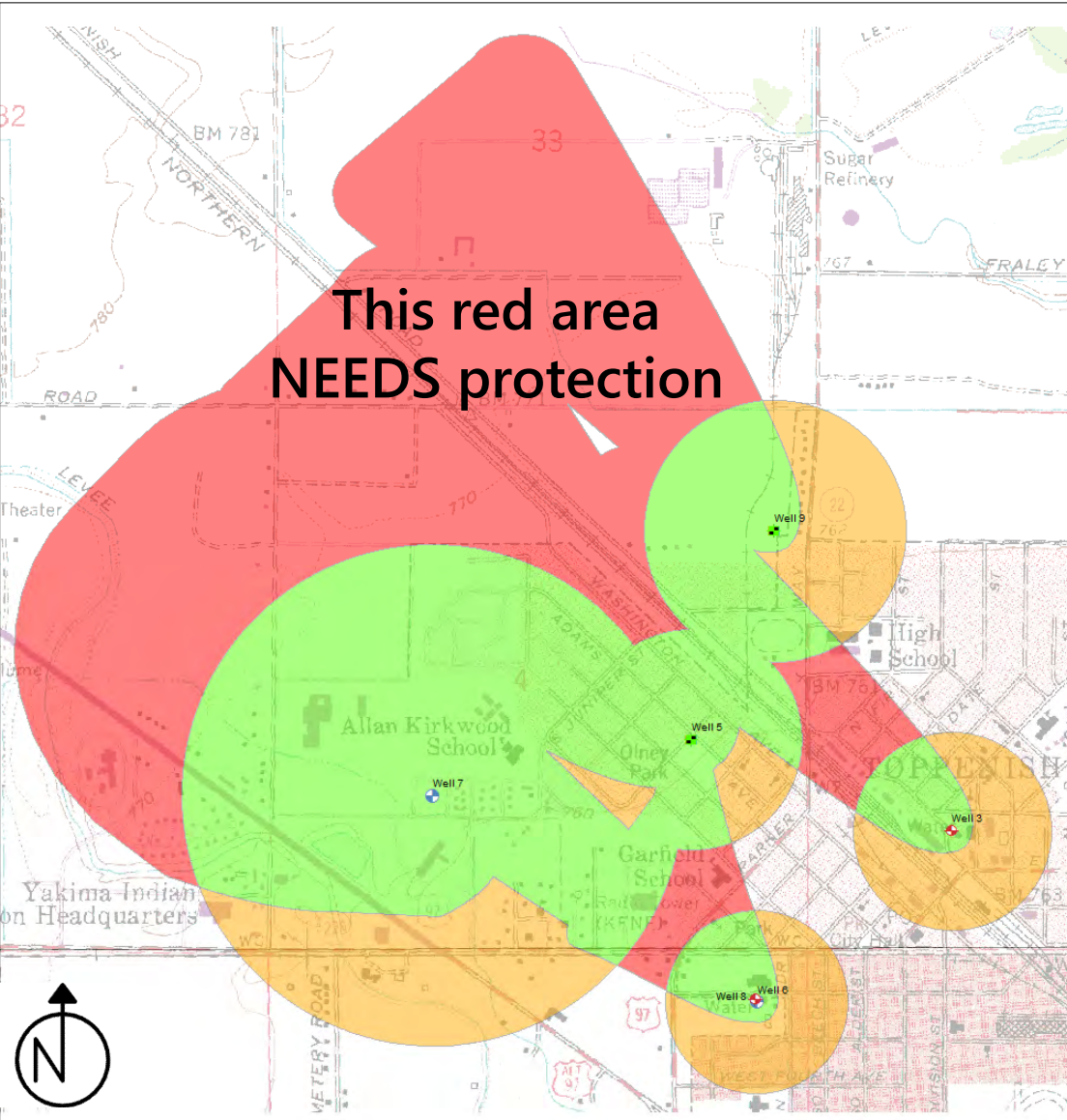
Conclusions—1

This orange area
does NOT need
protection



WHPAs created with
the CFR method **tend
to include areas that
do not need
protection**

Conclusions—2



WHPAs created with the CFR method sometimes include the WHPA defined by modeling, **but often do not include areas that need protection**

Conclusions—3



WHPAs created with the CFR method tend to

- **Erroneously identify potential hazards.**
- **Under-rank hazards that are identified by modeling**

Nearly 2,000 hazards here were identified by the CFR method, but not the numerical modeling method

What You Put Into It/What You Get Out of It

		Modeling Approach				
		CFR	Analytical Modeling	Hydrogeologic Mapping	Numerical Modeling (Existing Model)	Numerical Modeling (New Model)
Effort	Time	quick	moderately quick	weeks to months	moderately quick	months
	Cost	minimal	relatively low	moderately expensive	relatively low	expensive
	Required Data	low	moderate	high	low	extremely high
	Technical Expertise Required	low	moderate	high	high	high
	Software	none	special modeling software	special modeling software (optional)	special modeling software	special modeling software
Result	Accuracy	low	moderate	high	very high	very high

Benefits of Moving from CFR to Modeling



- Improved reliability & predictability
- Improved planning certainty
- Better able to identify contaminants
- Better able to correspond to zoning

but...



~~Problem~~ Solution

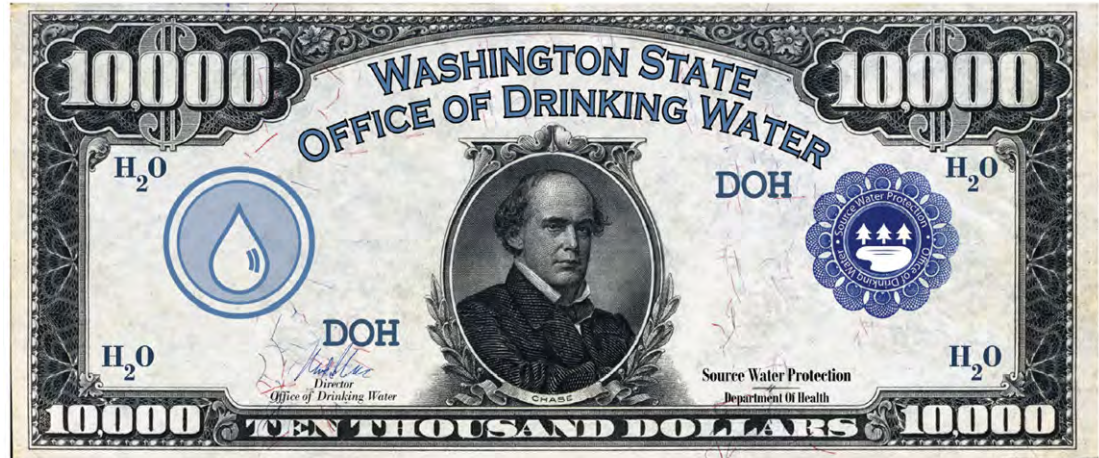
We can help!

Source Water Protection Funding Basics

- Available for all non-DWSRF projects & project costs
- Available to all nonprofit Group A systems
- Available year around until funding is exhausted
- \$30,000 per project (unless regional)



Using Source Water Protection Funding



- Studies, monitoring, modeling
- Projects must be expected to provide long-term benefit to drinking water quality or quantity
- Need to meet all contracting requirements
 - Cost reimbursement
 - 30-45 days - contract execution
 - Eligible to receive federal grant
- [Local Assistance Grant Program](#)

Successful Projects

- Preparations needed to acquire 250 acres of priority watershed
- Update wellhead protection areas using modeling method
- Forest management plans to maintain or enhance water quality
- Watershed protection through community outreach & education
- Nutrient contamination study
- Alternate supply studies—hydrogeological studies
- Critical aquifer mapping

Drinking Water Provider Partnership

- Restore & protect the health of watersheds that communities depend on for drinking water while also benefiting aquatic & riparian ecosystems, including native fish
- Support local partnerships between drinking water providers, landowners & restoration practitioners
- \$10,000 – \$50,000 per project
- Proposal deadline 1/07/2023
- Application link www.workingwatersgeos.org

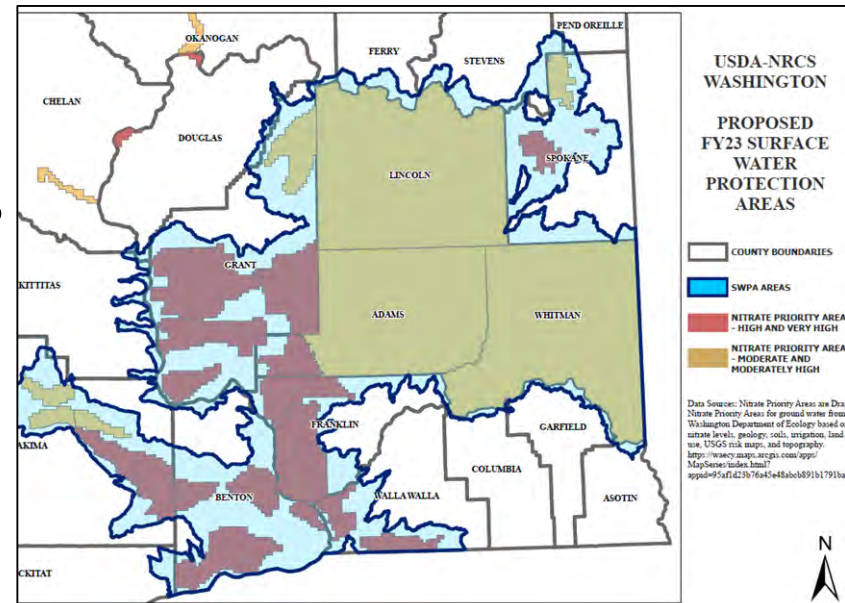


WA Dept of Ecology Funding Sources

Clean Water State Revolving Fund	CWSRF	Loans
Stormwater Financial Assistance Program	SFAP	Grants
Centennial Clean Water Program	Centennial	Grants
Clean Water Act Section 319 Program	Section 319	Grants

USDA—NRCS

- Farm Bill requires 10% funding to benefit drinking water
- Funding goes to producers as a cost share
- Opportunity to partner with conservation district & other regional agricultural partners



Any
Questions

Need to know more? Need help?

Contact Information

Nikki Guillot

360-236-3114

Nikki.guillot@doh.wa.gov

doh.wa.gov/DrinkingWater



handle: WADeptHealth

