

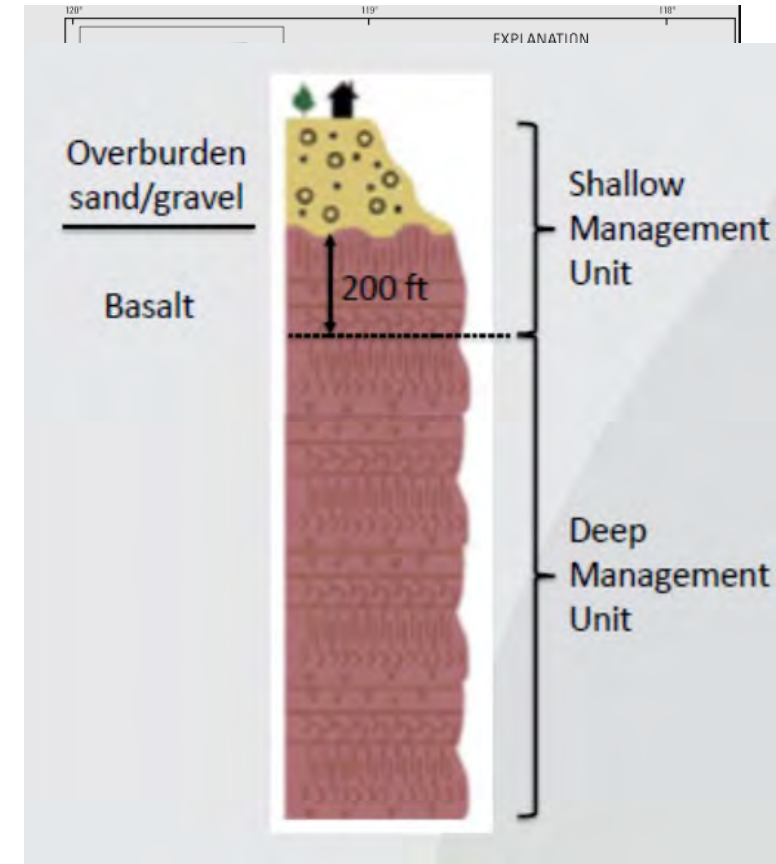
Groundwater Management (Sub) Areas

Eric Weber – Landau Associates

Sheryl Howe – Washington Department of Health

GWMA Regulatory Background

- **RCW 90.44 – the Groundwater Code**
 - **Subsection – 130:** Priorities as between appropriators- Department in charge of groundwater withdrawals – **Establishment and modification of groundwater areas and depth zones – Declarations by claimant of artificially stored water.**
 - For this purpose, the department shall have authority and it shall be its duty from time to time..... to designate **groundwater areas or subareas**, to designate **depth zones**....to the end that withdrawals therefrom may be administratively controlled...
 - Within ninety days after designation of a groundwater area... any person or organization ...claiming to be the owner of **artificially stored groundwater**.... shall file a certified declaration to that effect



GWMA Regulatory Background

- **RCW 90.44 – the Groundwater Code**

- **Subsection – 400: Groundwater management areas –Purpose-Standards-Identification-Designation.**

- The department of ecology, in cooperation with other state agencies, local government, and user groups.....
- Sub-areas shall include...

- (a) Aquifer systems that are declining due to restricted recharge or over-utilization;
- (b) Aquifer systems in which overappropriation may have occurred and adjudication of water rights has not yet been completed;
- (c) Aquifer systems currently being considered for water supply reservation under chapter 90.54 RCW for future beneficial uses;
- (d) Aquifers identified as the primary source of supply for public water supply systems;
- (e) Aquifers designated as a sole source aquifer by the federal environmental protection agency;
- and
- (f) Geographical areas where land use may result in contamination or degradation of the groundwater quality.

King County Washington
Has 5 GWMA's designated
Under the provisions of
WAC 173-100



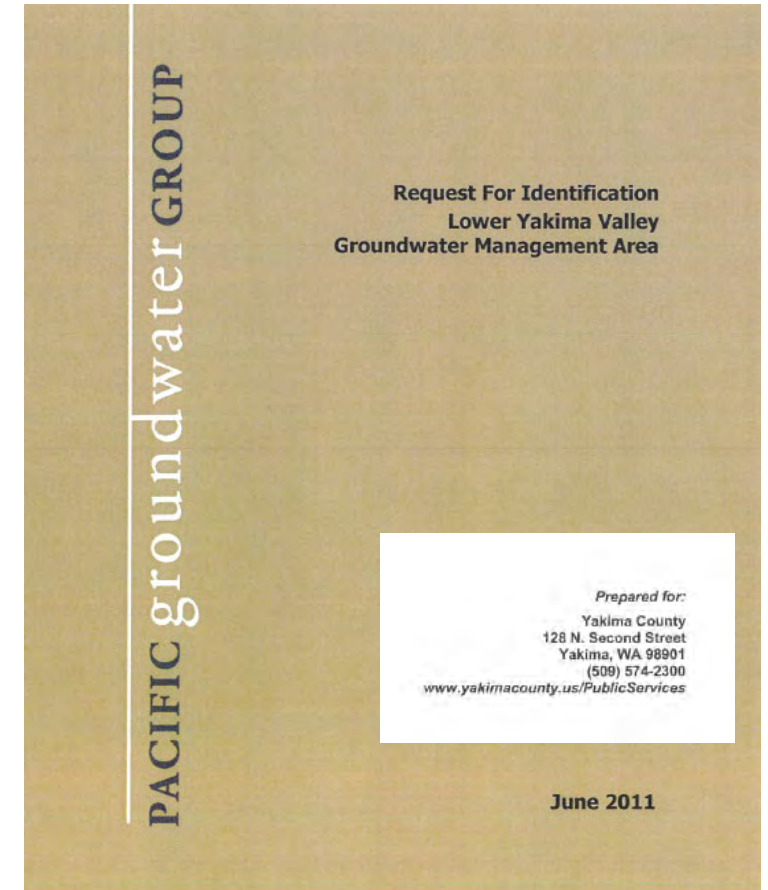
GWMA Regulatory Background

- **WAC 173-100: Groundwater management Areas and Programs**
 - Subsection 010: Purpose
 - The purpose is to establish guidelines, criteria for the designation of groundwater areas... to protect groundwater **quality**, to assure groundwater **quantity**, and to provide for **efficient management** of water resources.
 - The intent ... is to **forge partnerships** between a diversity of local, state, tribal and federal interests.
 - Three types of GWMAS
 - Water Quality
 - Water Quantity
 - Resource management

GWMA Regulatory Background

WAC 173-100: Groundwater Management Areas and Programs

- Request for designation (WAC 170-100-**060**)
- GWMA designated by the order of the department (WAC 173-100-**070**)
 - i.e., Docket No. 73-34
 - and sometimes followed by a rule
- Cooperation with local government
- Identify lead agency (WAC 173-100-**080**)
- Provisions for the appointment of a groundwater advisory committee (WAC 173-100-**090**)



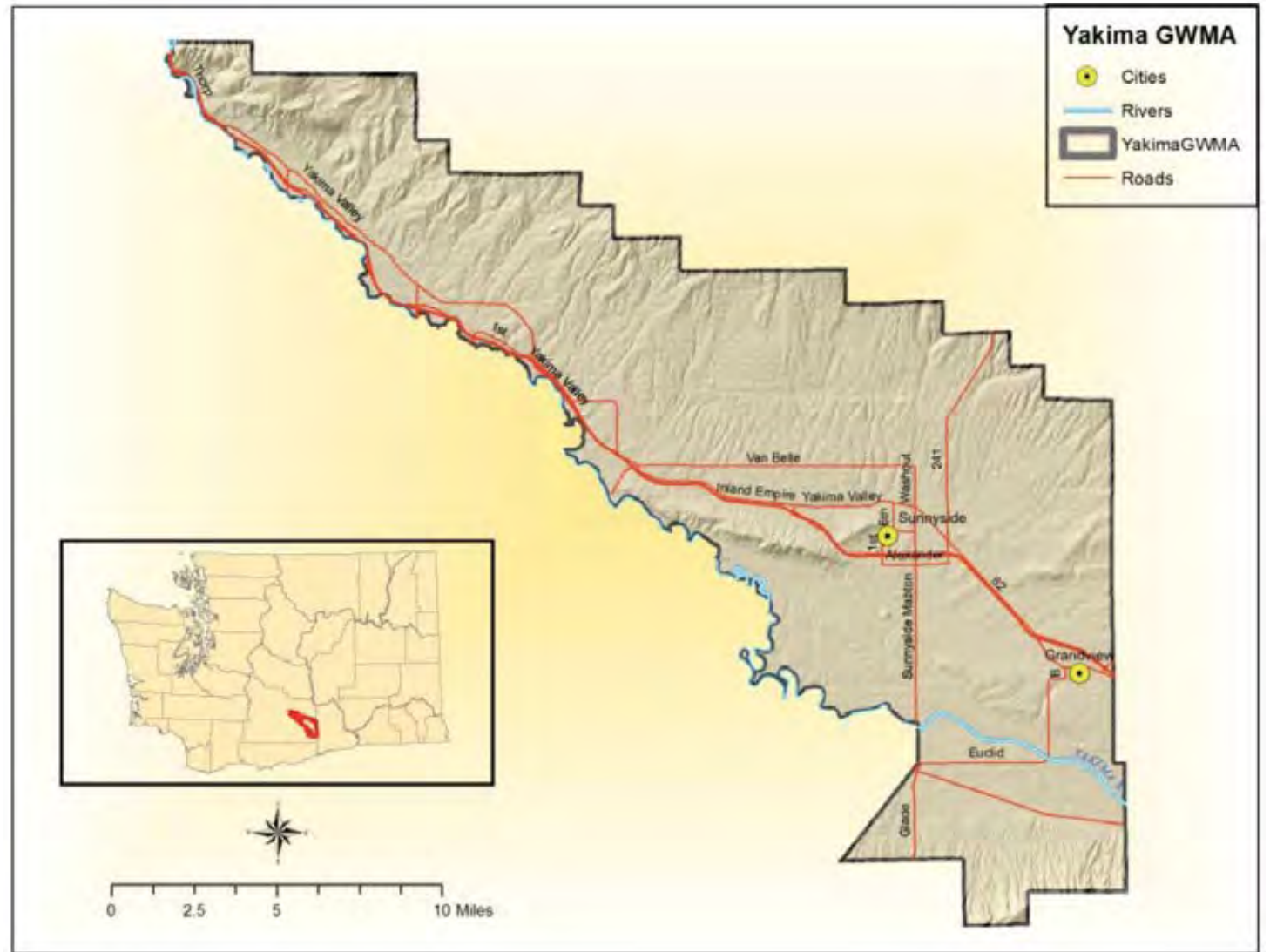
Lower Yakima Valley GWMA

Sheryl Howe, Washington State Department of Health

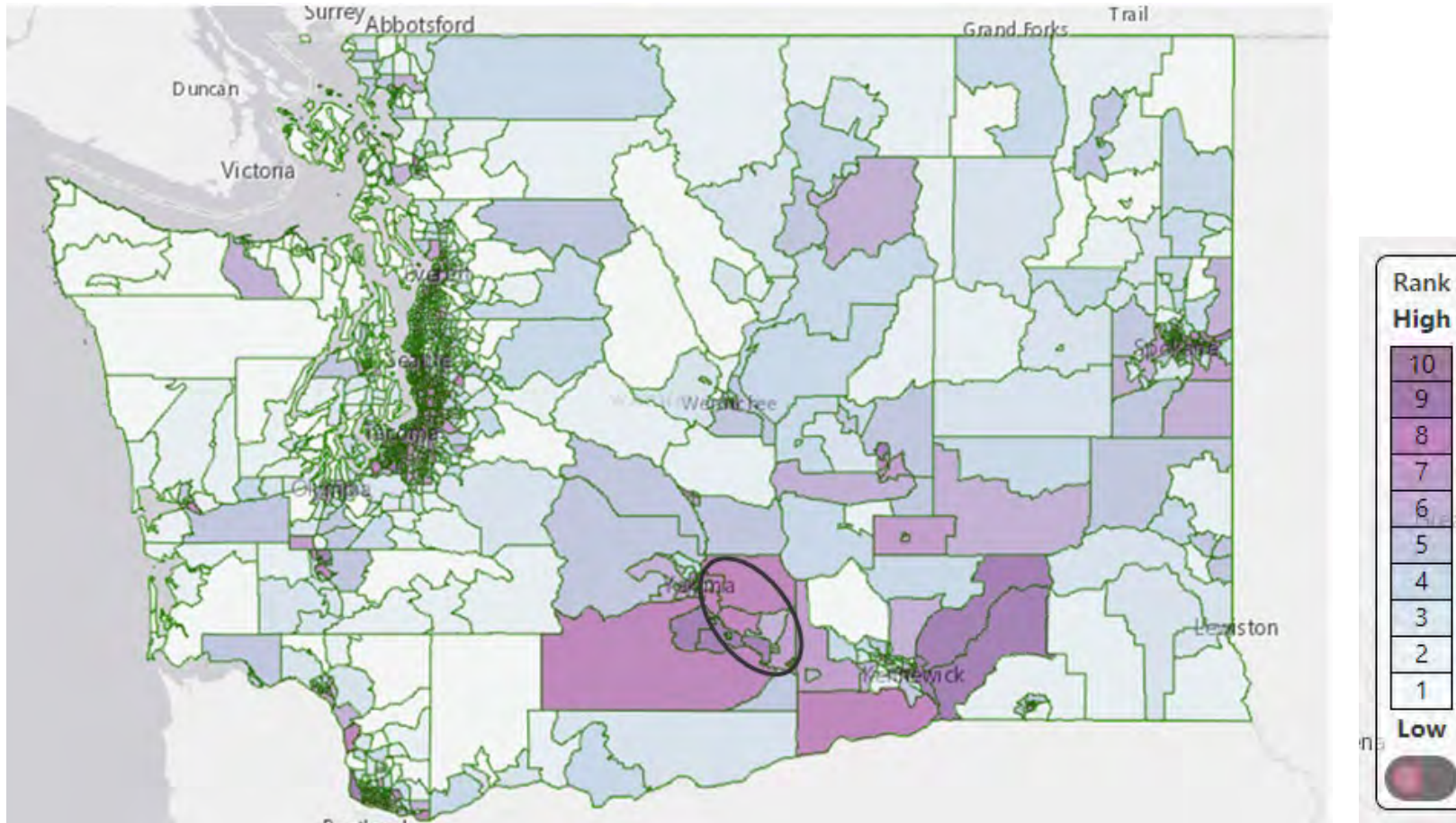
LYV GWMA Project Coordinator

LYV GWMA

- 175,000 acres
- Rural, agricultural
- Elevated nitrate



Environmental Justice Community of Concern



Groundwater Management Area (GWMA)

- Locally driven effort
- Community support
- Plan
 - 7 years
 - 1 goal:

Reduce nitrate concentrations in groundwater below state drinking water standards

12 years later.....

- Collaborative efforts
- Implementing recommended actions



PCHB Certification

Pollution Control Hearings Board required Ecology to:

- 1. Identify a new lead agency to implement the Program.*
- 2. Submit a prioritized implementation schedule for the work*
- 3. Seek funding to provide immediate assistance for residents in the GWMA whose drinking water nitrate levels are consistently above the safe drinking water standard.*

PCHB and Petition to EPA

Safe Water



Source Control





Washington State Department of
HEALTH



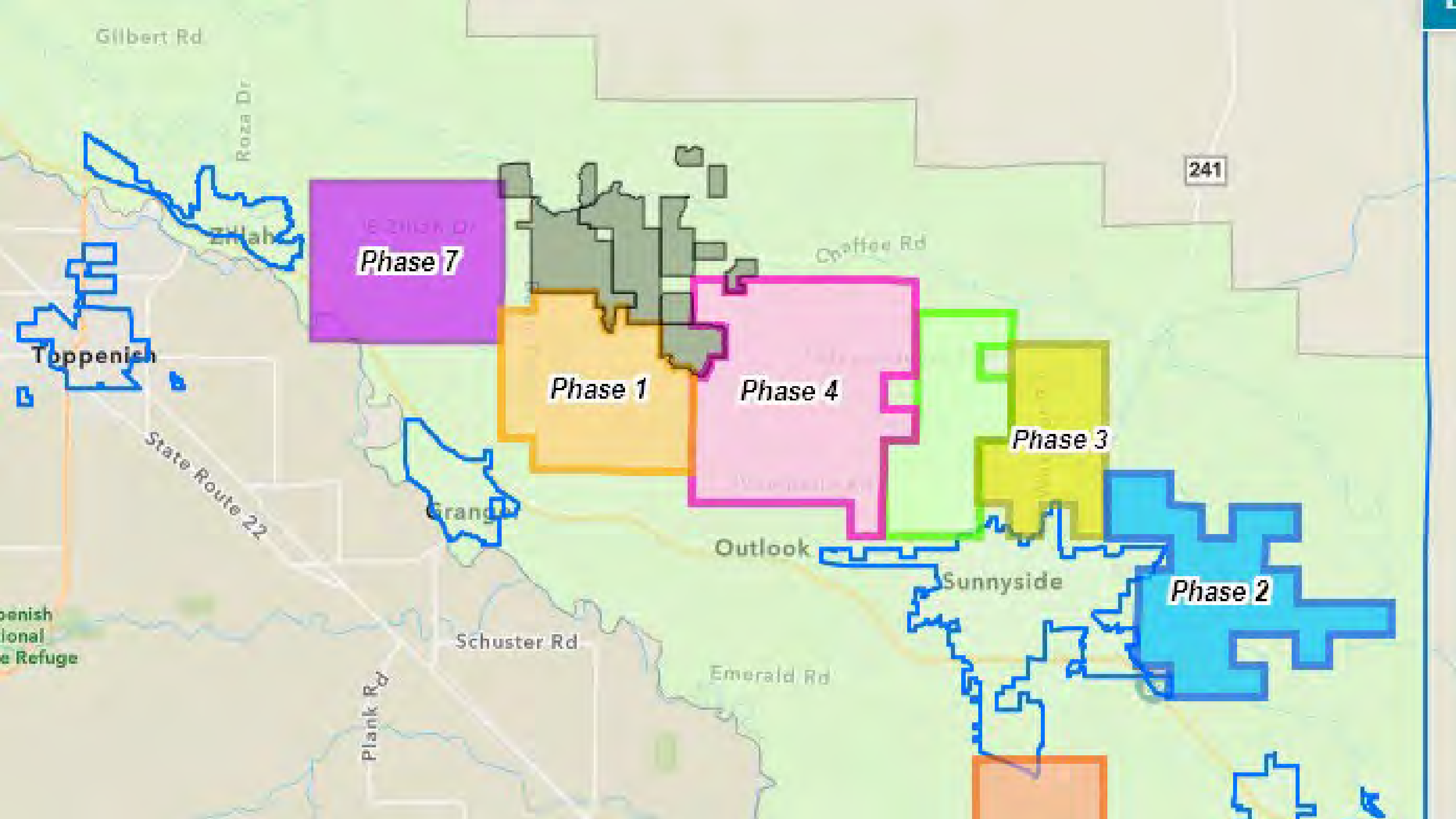
Bottled Water - DOH

- June 2022 - homeowners in ambient groundwater monitoring network
- NO_3^- concentrations were above 5 mg/L.
- 47 homes enrolled
- Transitioning from delivery to the installation of a R-O system

Safe Water

- July 2023 - \$850,000 from the legislature to start Safe Water
- DOH - \$358,000
- An additional \$1 million allocated in 2024





Gilbert Rd

Roza Dr

241

16 21138 Dr
Phase 7

Crayton Rd

Zillah

Toppenish

Phase 1

Phase 4

Phase 3

State Route 22

Frank

Outlook

Sunnyside

Phase 2

penish
ional
e Refuge

Schuster Rd


Emerald Rd

Plank Rd

Source Control



- 2015, the Yakima County and GWAC partnered with WSDA's Natural Resources Assessment Section (NRAS)
- Provide an estimate of nitrogen available for transport from different sources.
- Nitrogen that has the potential to move from the land surface or soil profile into groundwater.
- How much *could* be available



Washington
State Department of
Agriculture

**Estimated Nitrogen Available
for Transport in the Lower
Yakima Valley Groundwater
Management Area**

**A Study by the Washington State
Department of Agriculture
and Yakima County**

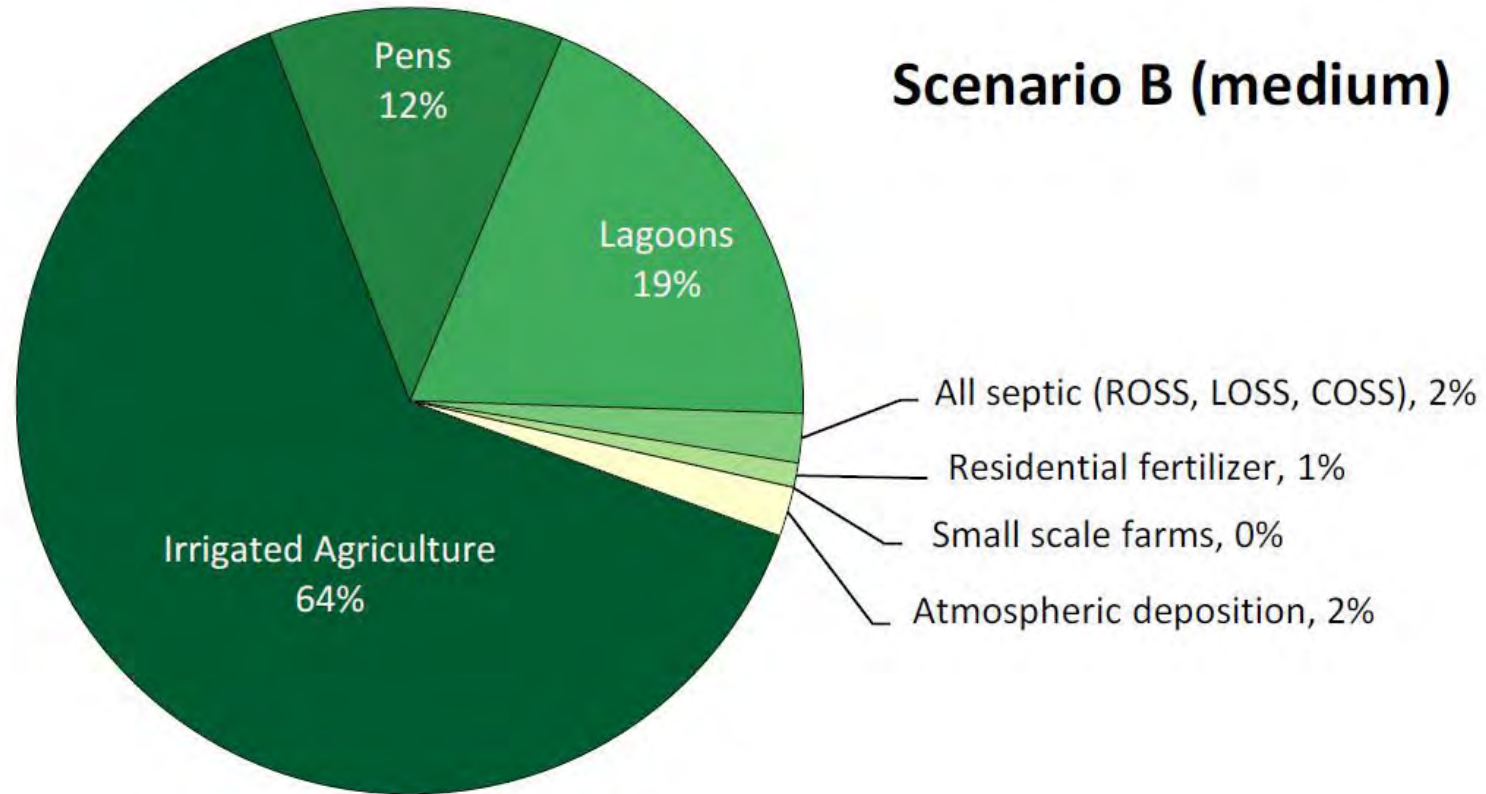
WSDA authors:
Gary Bahr, Perry Beale, Margaret Drennan, Jaclyn Hancock,
and Kelly McClain

Yakima County authors:
Cynthia Kozma, Michael Martian, and Vern Redifer, P.E.

June 2018

AGR PUB 103-691 (N/6/18)
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Scenario B (medium)





Dairy Nutrient Management Program

- DNMP is working closely with dairy farmers to increase adoption of agronomic best management practices.
- Biennial inspections of the production and land application area
- Inspection of waste storage ponds, pens and composting areas for adherence to BMPs
- Review of required record keeping and agronomy
- • Provide high-level grower recommendations on agronomy for forage crops production



SYCD's Nutrient Assessment and Planning Program

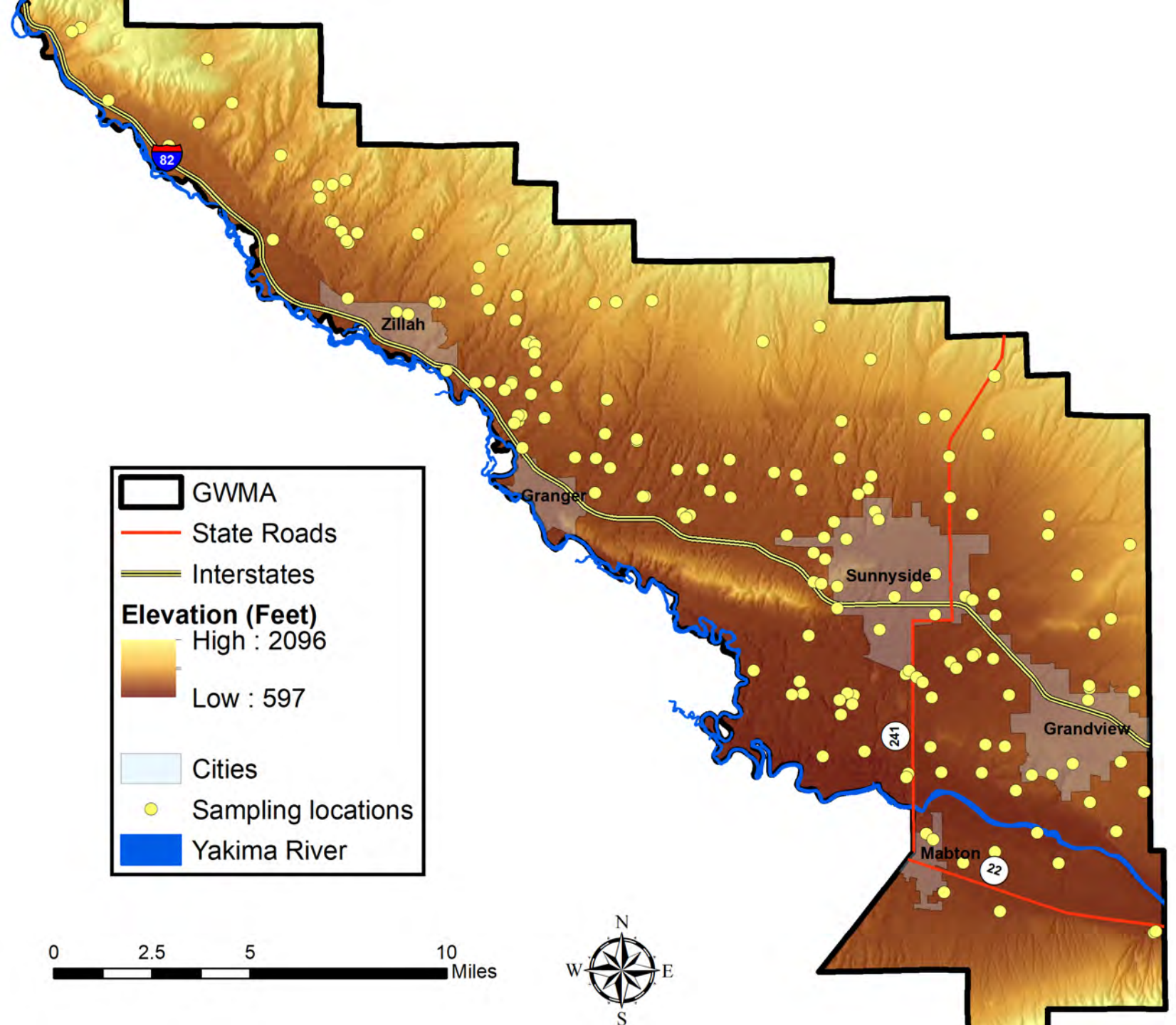
- Nutrient management planning
- Irrigation water management planning
- Deep soil sampling
- Soil moisture monitoring
- Field day trainings



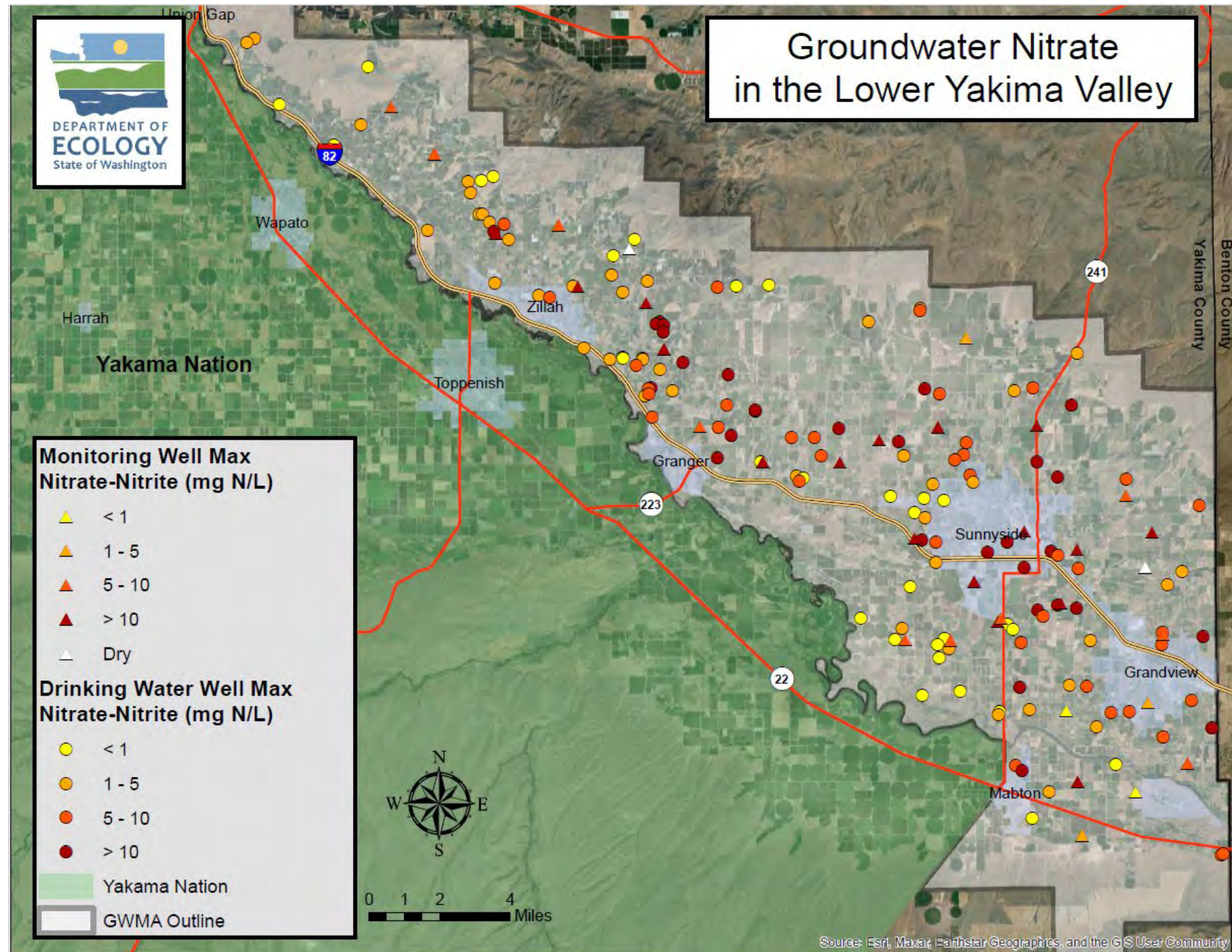
Other Implementation Actions

- Develop a bilingual, health-risk education and outreach campaign.
- Encourage municipalities within the GWMA to extend municipal sewer systems within urban growth areas and retire ROSS and LOSS.
- Develop a plan for finding and decommissioning abandoned wells.
- Perform an engineering study of water supply alternatives.
- Provide assistance to YHD regarding the regulation of composting operations.
- Require facility process improvements in wastewater treatment and food processing plants to reduce nitrogen discharge volumes.

Ambient Groundwater Monitoring Well Network



Ambient Groundwater Monitoring Well Network





Land Use and Groundwater

- Identify land use practices that reduce nitrate loading to groundwater.
 - Nutrient management
 - Cover crops
- WSU Agricultural Research Center, Prosser, WA
- Soil health study with wine grapes

Contact Information

Sheryl Howe

Hydrogeologist

LYV GWMA Coordinator

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www.doh.wa.gov/drinkingwater



handle: WADeptHealth

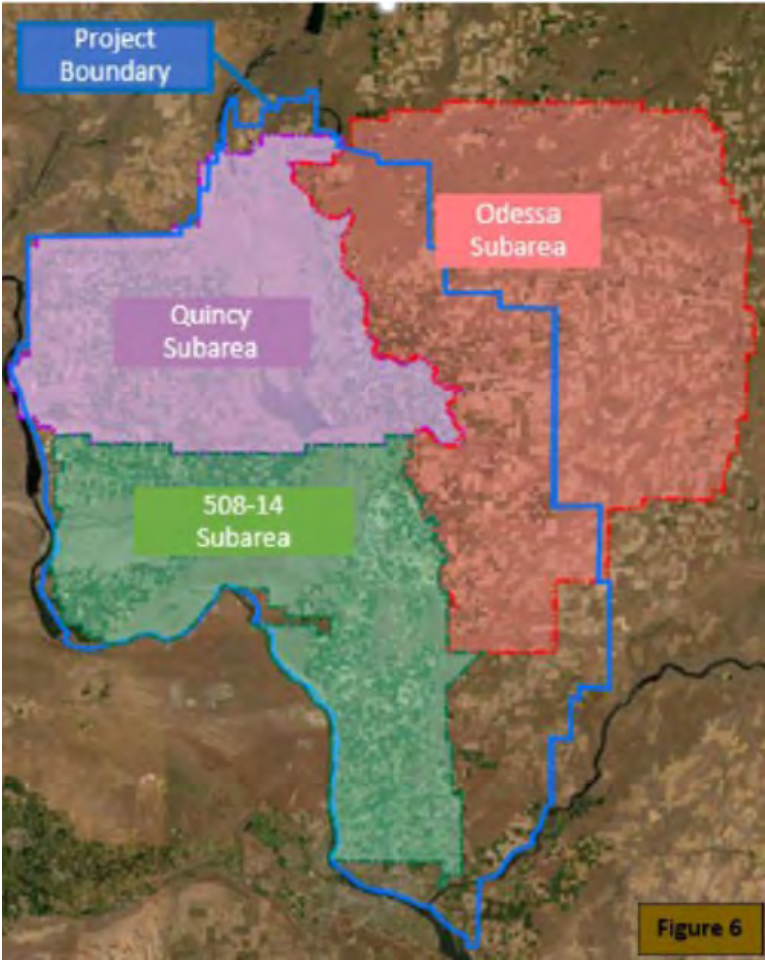


Groundwater Management (Sub) Areas

GWMAs of the Columbia Basin

Eric Weber - Landau Associates
eweber@landauinc.com

The Three Columbia Basin GWMA's



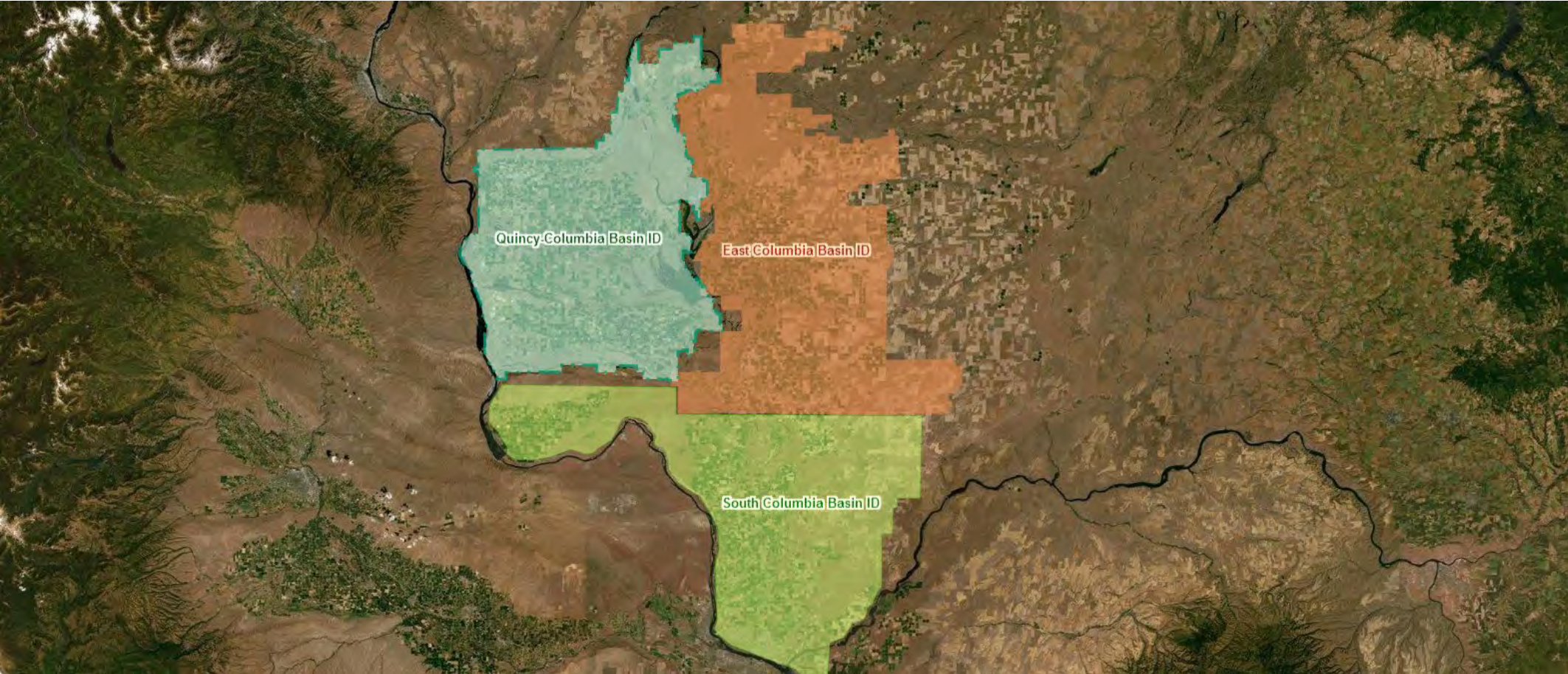
Columbia Basin Project



Columbia Basin Project
Ecology Permits for:
720,000 acres



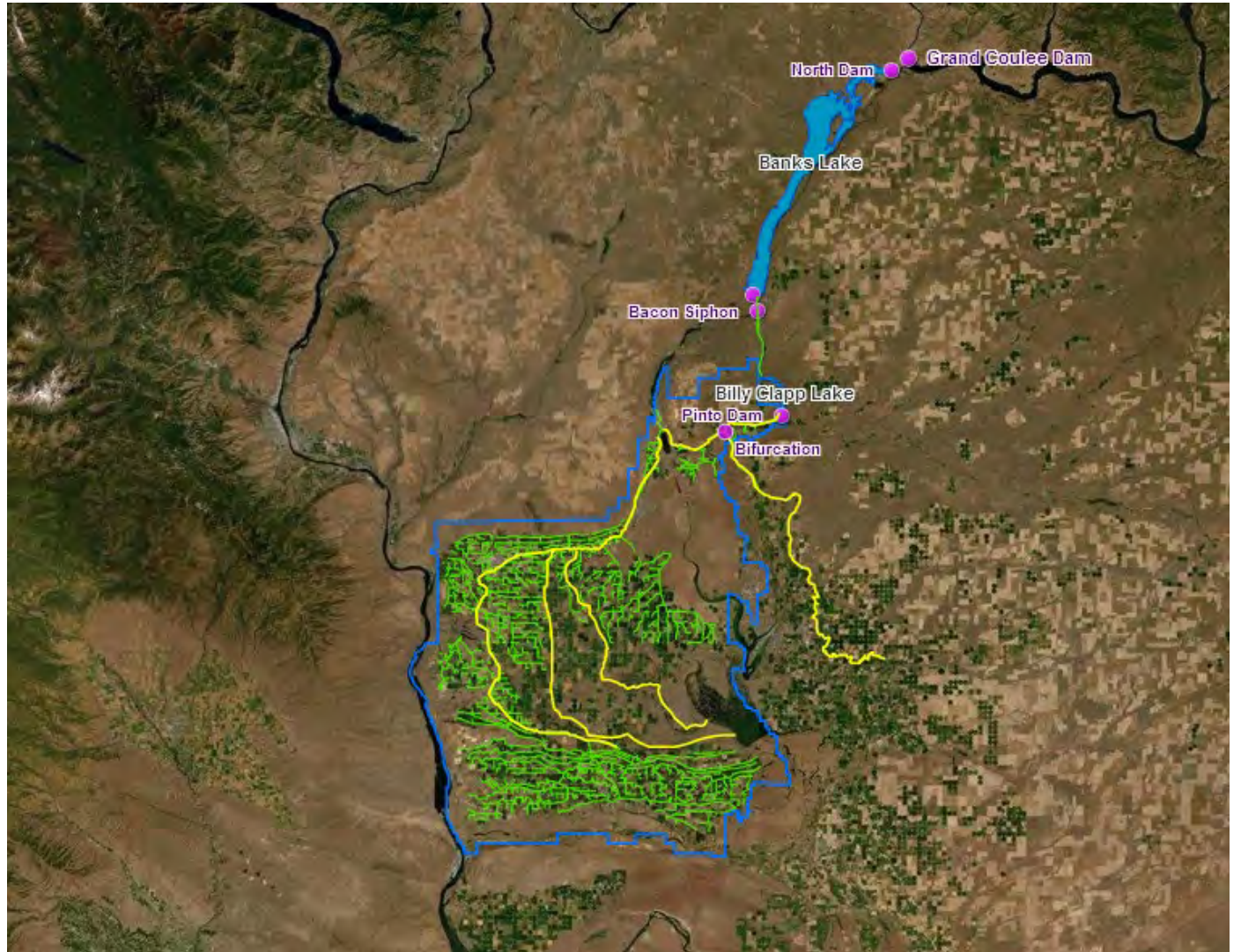
The CBP Irrigation Districts



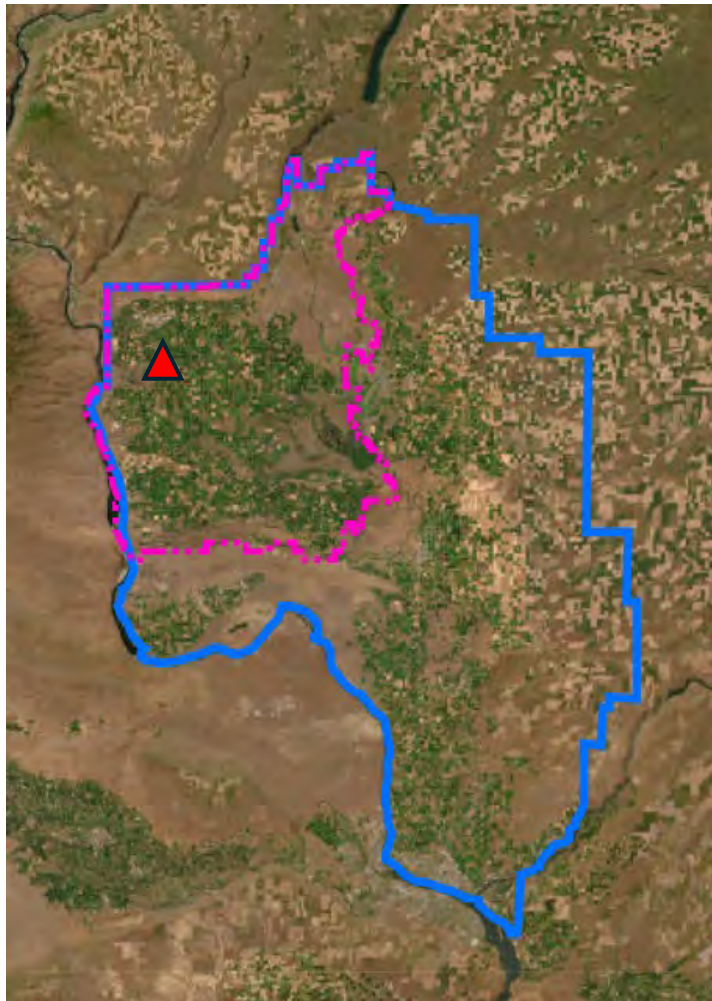
QCBID Canals



Canal



Quincy Basin



Simulation of Groundwater Storage Changes in the Quincy Basin, Washington

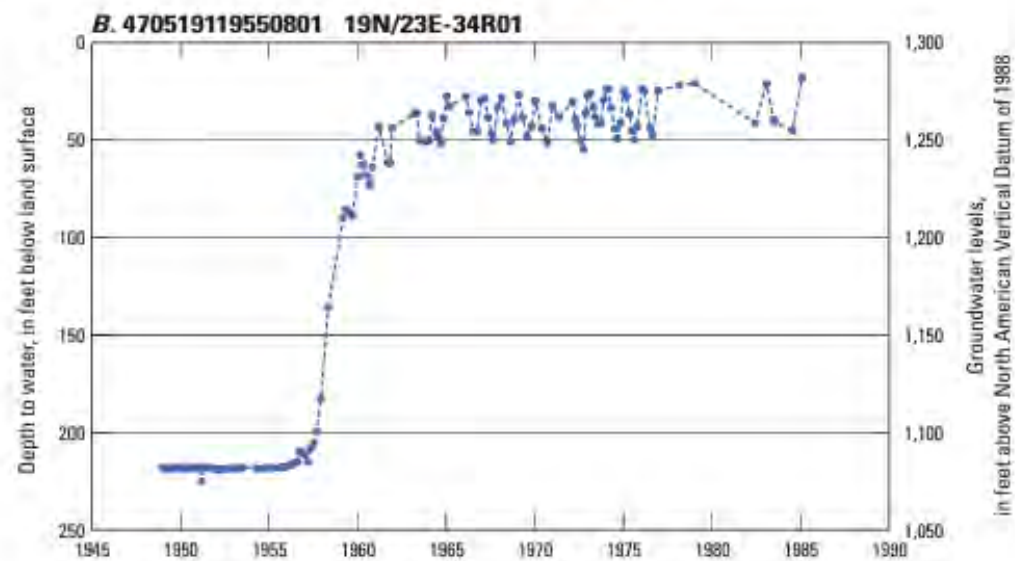


Figure 10.—Continued

Whose Groundwater is It?

- Artificially Stored Groundwater (ASGW)
 - The Bureau intended to capture the irrigation return flows behind O’Sullivan Dam for use in the South District
- Natural or Public Groundwater
 - Farmers were drilling wells to tap the “new” resource
- These resources are “Commingled”



Quincy GWMA

1967 Ecology Put the Brakes on:

- **WAC 508-14-020** curtails further groundwater development (1967)
- Ecology Order **DE No. 67-3** establishing GWMA boundaries
- Ecology Order **DE No. 67-4** establishing GWMA rules
- Ecology Lead Agency
- Technical committee: Bureau and Ecology and others
- MOU between Ecology, the Bureau and the QCBID

Permit Provision

- This permit authorizes withdrawal of public ground waters subject to a final determination as to the availability of public groundwaters determined from a comprehensive groundwater study scheduled for completion Dec 31, 1972.

Quincy GWMA Timeline

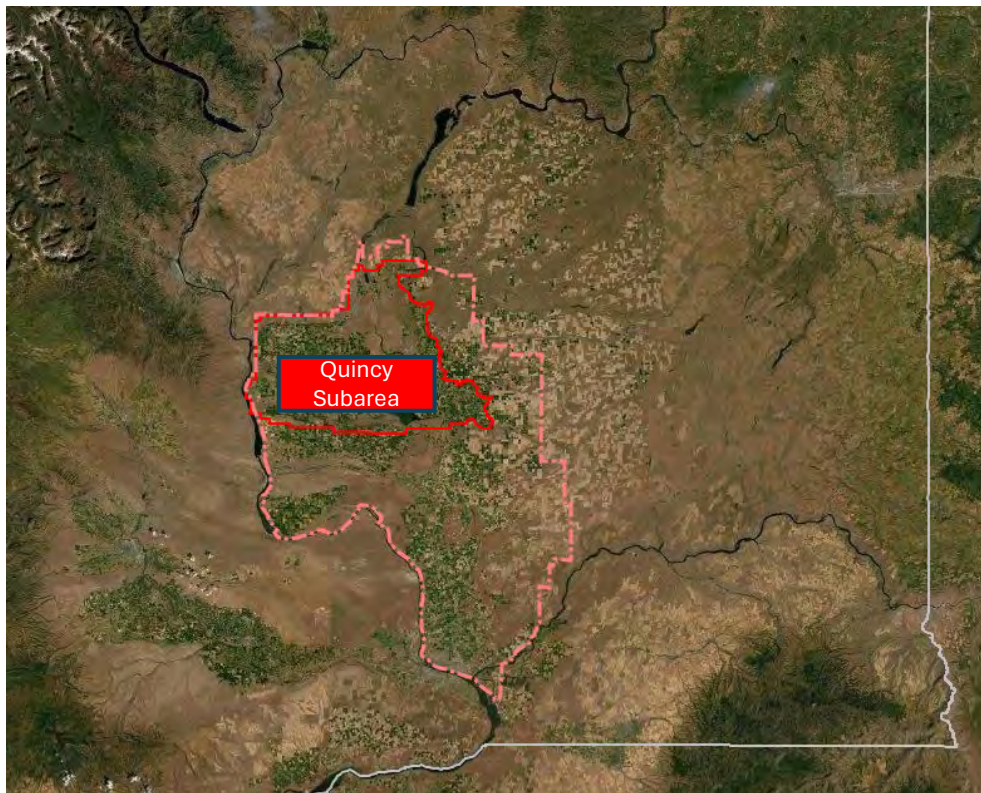
Timeline

- Jan 1973: **WAC 173-124**: Quincy Groundwater Management Subareas and Zones
- 1973: Bureau Declaration for ASGW (RCW 90.44.130)
- Jan 1975: **WAC 173-134**: Quincy Groundwater Management Policy
- Jan 1975: **DE No. 74-772**: Bureau Declaration of ASGW accepted by Ecology

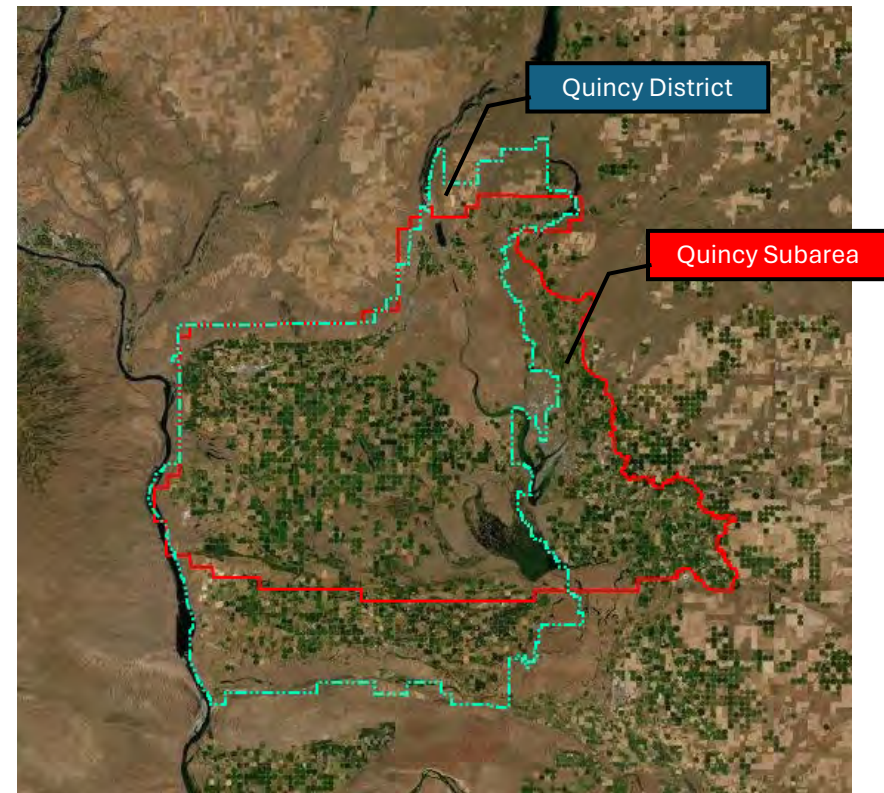
Quincy GWMA

State Designated Quincy Groundwater
Management Sub Area

WAC 173-124



Irrigation District v. Subarea

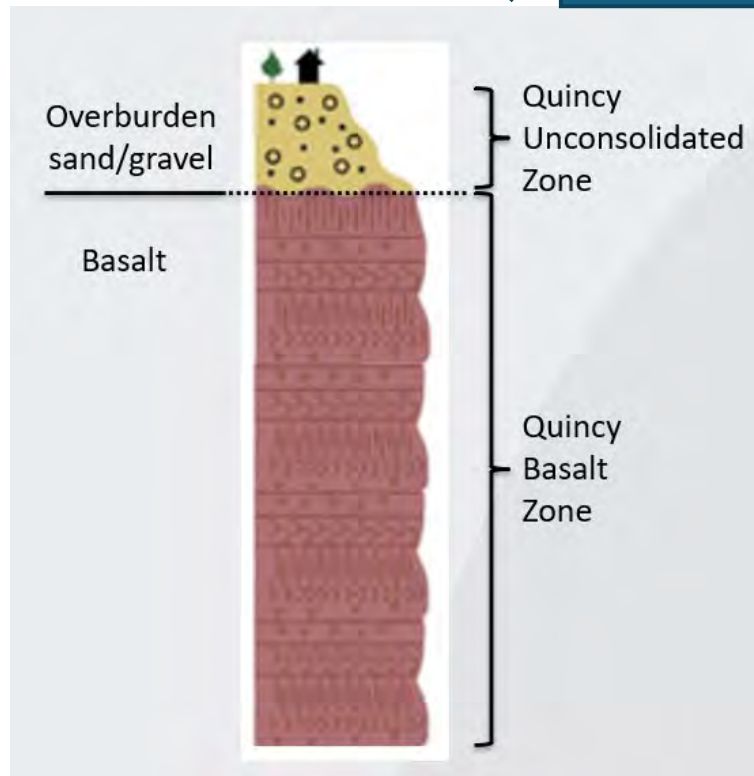


Quincy GWMA

Public versus Artificially Stored Groundwaters

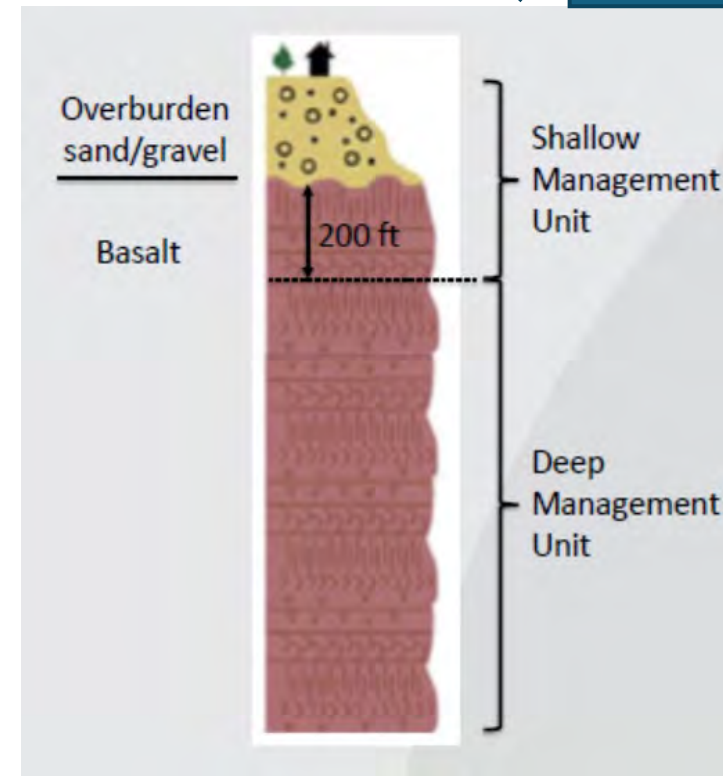
Public

WAC 173-124-050



ASGW

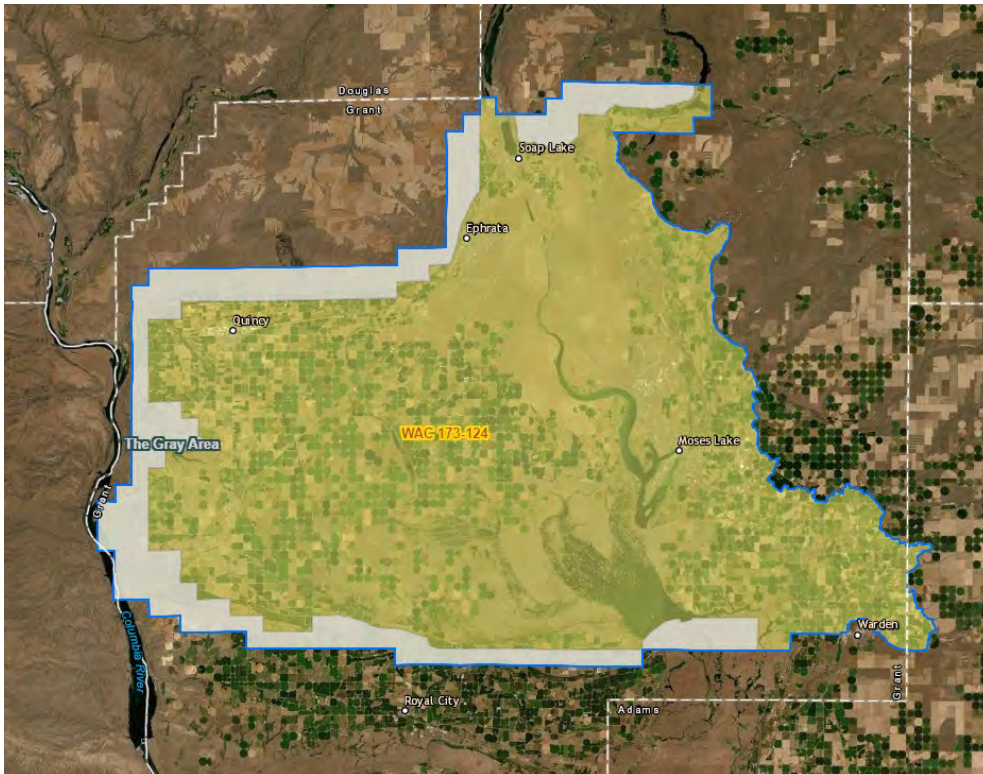
WAC 173-134A-040



Quincy GWMA Public Groundwaters

WAC 173-134A

Quincy Subarea



Public Groundwaters

- Within the Quincy Subarea (yellow and gray portion)
- Shallow Management Unit: 58,000 AF
- Deep Management Unit: 97,901 AF
- As of 1983, all public GW allocated

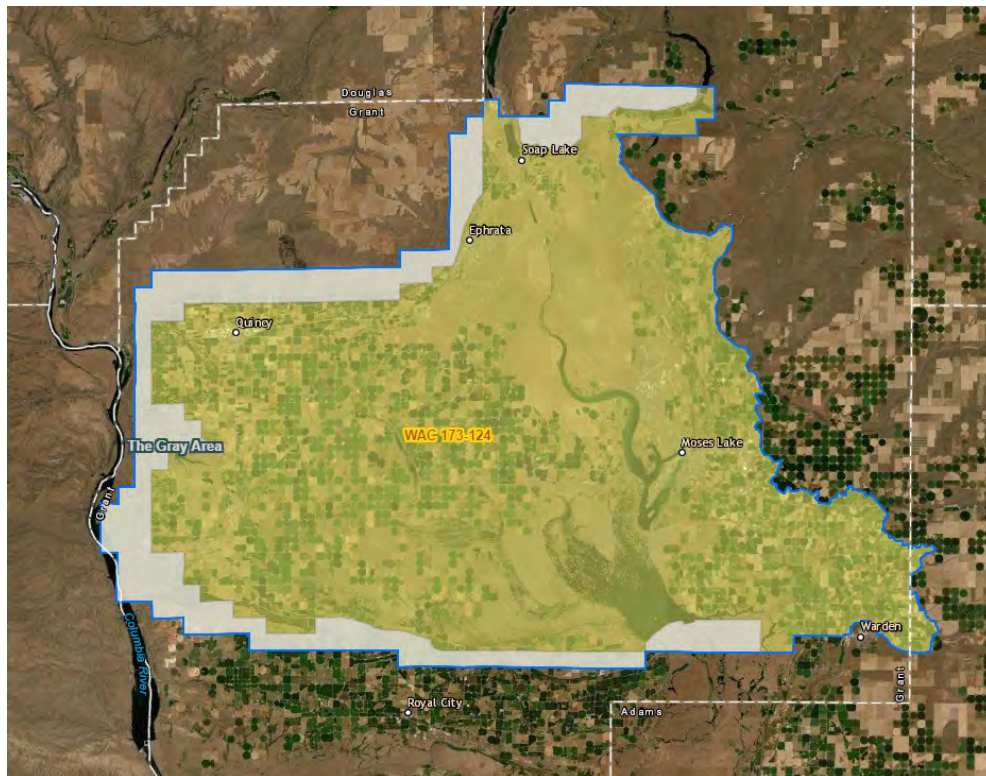
Quincy GWMA

Federal Artificially Stored Groundwater

WAC 173-134A

Quincy Subarea

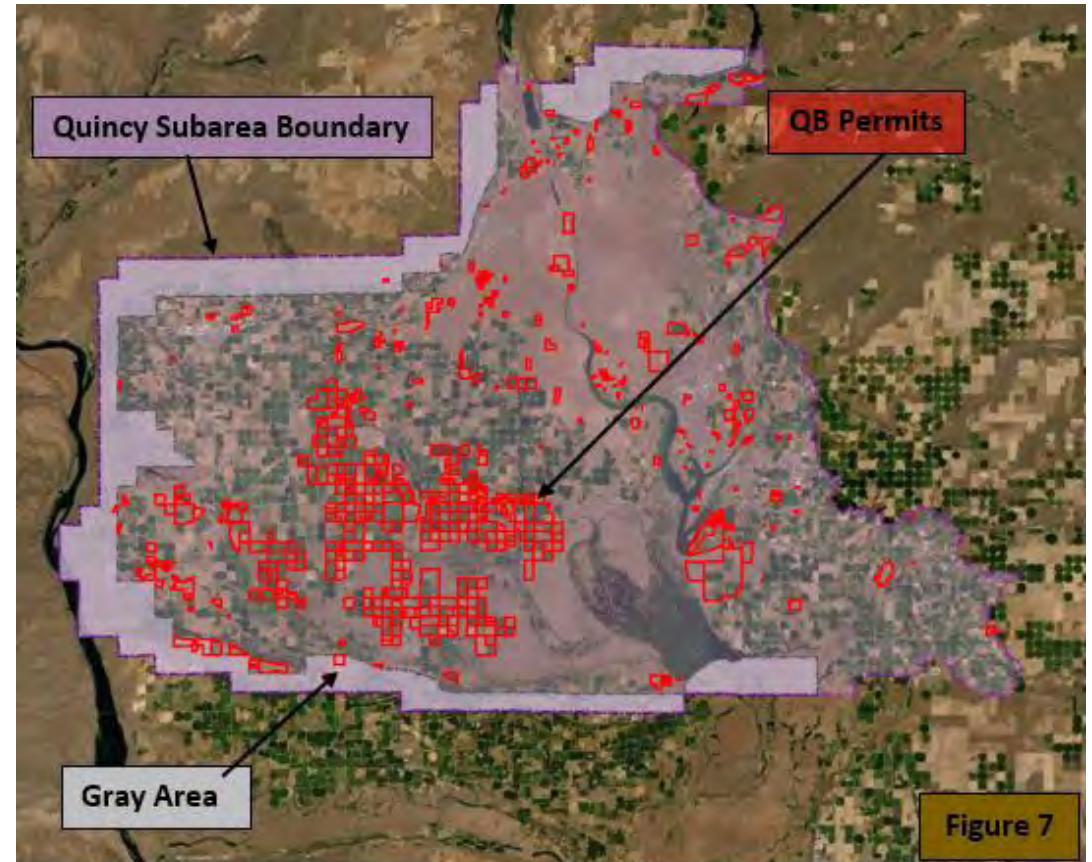
Federal Artificially Stored Groundwater



- Within the Quincy Subarea (yellow portion)
- 177,000 acre-ft of ASGW available for beneficial use
- Requires a Quincy Basin (QB) permit from Ecology
- Requires a water service contract (WSC) from the Bureau (about \$90/acre)
- Development schedule – 3 years
- Water Duty – 3.5 AF/acre
- Counts against federal (RRA) acreage limitation (0.543 to 1)

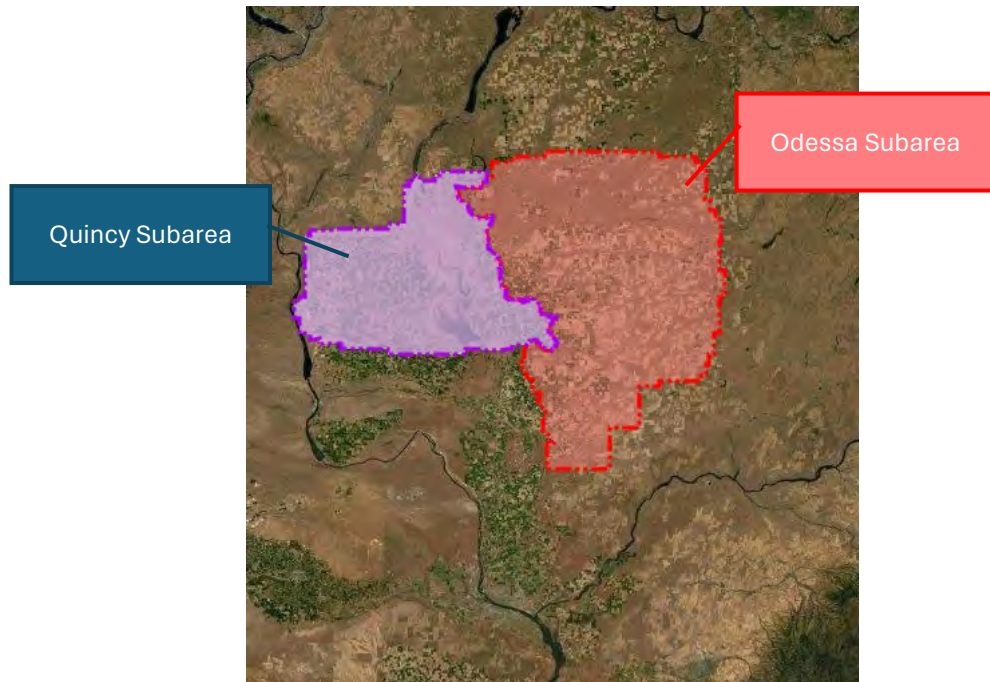
Quincy GWMA: QB Permits

- A permit written by Ecology for federal ASGW
- POU and POW can be changed
- Change application through Ecology
- Active secondary market

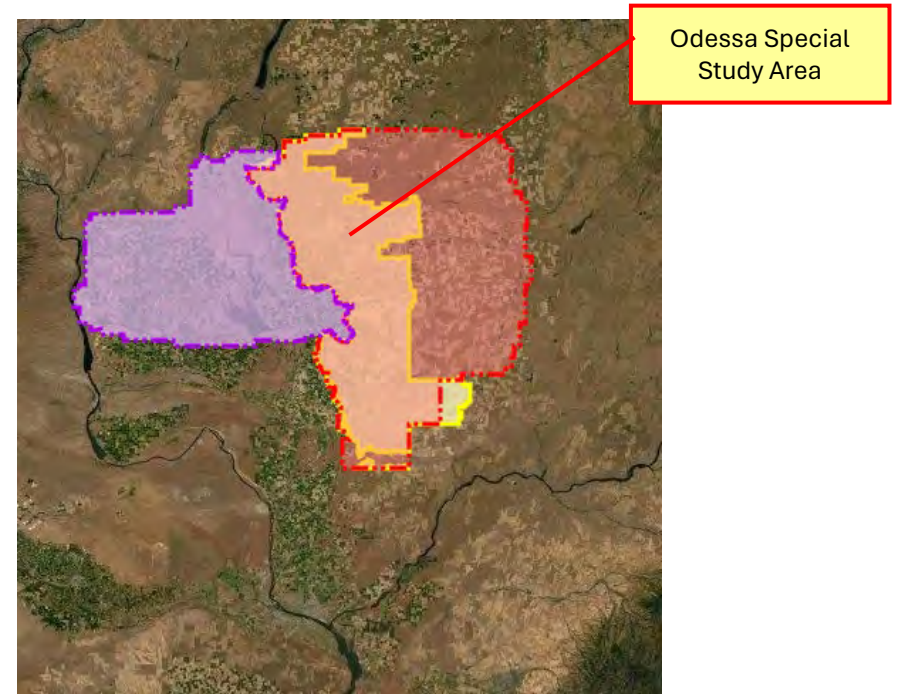


Odessa GWMA

Odessa Groundwater Management Subarea WAC 173-128A

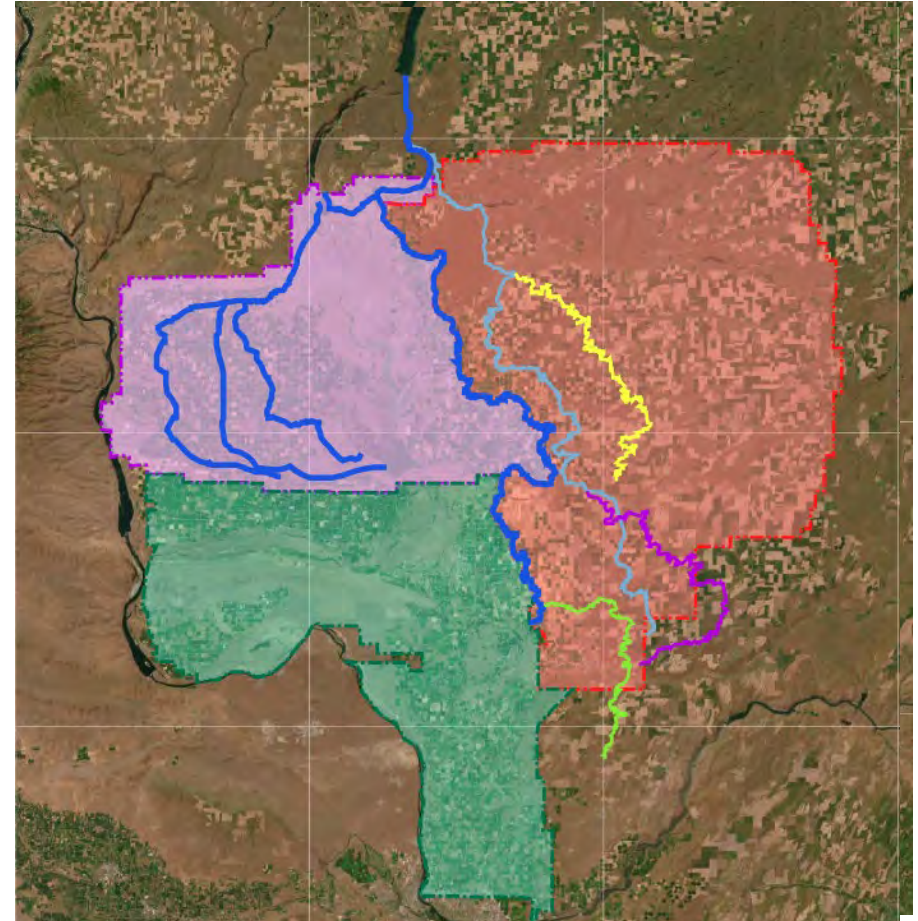


Odessa Special Study Area



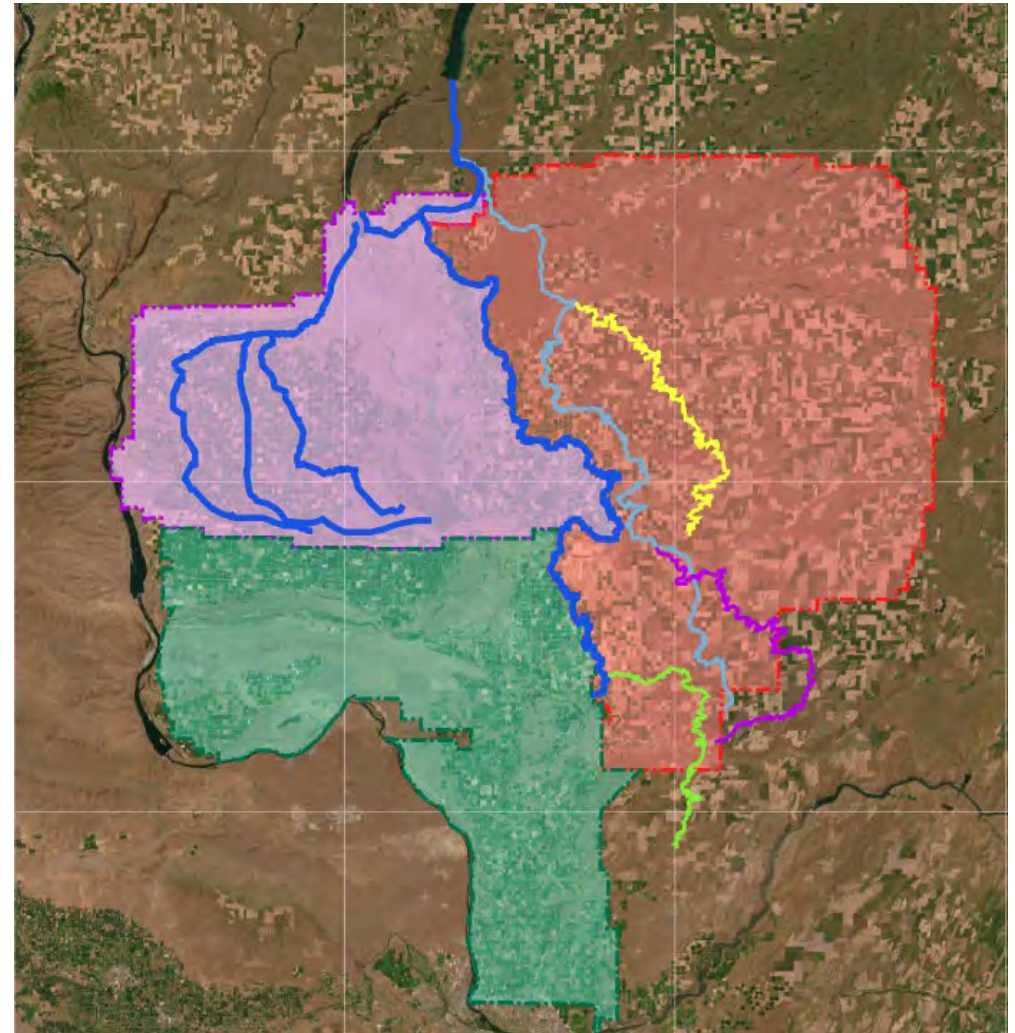
Odessa GWMA – The East High Canal

- Original Project 1,029,000 acres
- Current Project 720,000 acres

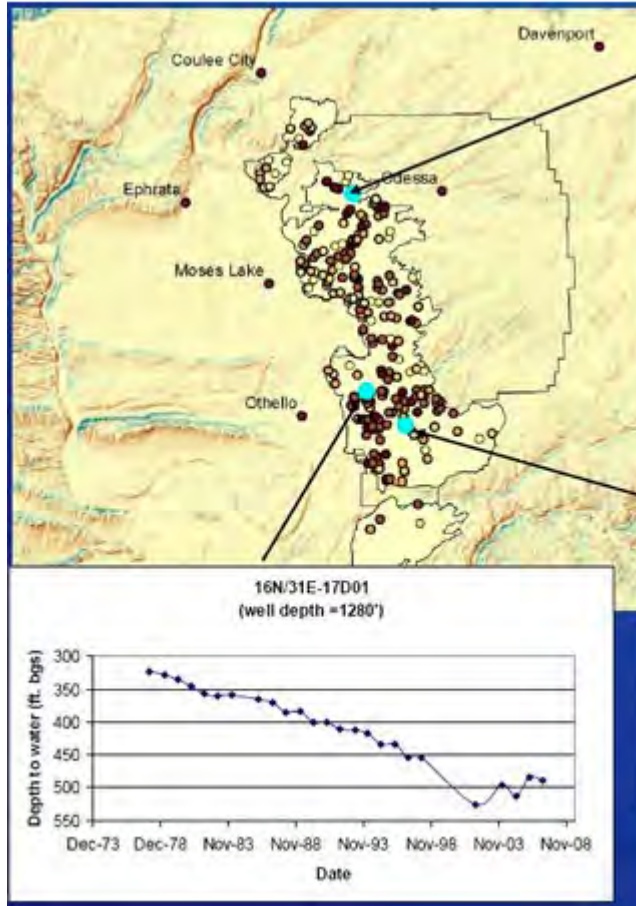


Odessa GWMA

- Ecology wrote groundwater permits in the Odessa Subarea with the understanding that federal surface water would eventually be supplied.



Odessa Groundwater



Starting and distance from section or subdivision corner

PROPOSED USE: Domestic Industrial Municipal
Irrigation Test Well Other

4) **TYPE OF WORK:** Owner's number of well 8
(if more than one)
New well Method: Dug Bored
Deepened Cable Driven
Reconditioned Rotary Jetted

5) **DIMENSIONS:** Diameter of well 12 1/2 inches.
Drilled 1720 ft. Depth of completed well 1720 ft.

6) **CONSTRUCTION DETAILS:**
Casing installed: _____ Diam. from _____ ft. to _____ ft.
Threaded _____ Diam. from _____ ft. to _____ ft.
Welded 16 " Diam. from 0 ft. to 600 ft.

Perforations: Yes No
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes No
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes No Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes No To what depth? _____ ft.
Material used in seal Cement
Did any strata contain unusable water? Yes No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

7) **PUMP:** Manufacturer's Name _____
Type: _____ H.P. 1750

8) **WATER LEVELS:** Land-surface elevation above mean sea level. 1780 #
Static level 530 ft. below top of well Date 4/24/76
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

9) **WELL TESTS:** Drawdown is amount water level is lowered below static level
Was a pump test made? Yes No If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
Test by Owner

(10) WELL LOG:
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Top Soil-Sand Ash	0	47
Black Basalt	47	53
Black Grey Basalt	53	123
Black Green Blue Basalt	123	150
Black Brown Basalt	150	160
Black Blue Green Basalt	160	350
Fine Black Basalt	350	355
Black Brown White Green (Water)	355	375
Black Grey Basalt	375	407
Black Brown Basalt	407	417
Red Clay (Water)	417	437
Black Basalt	437	523
Green White Black Basalt	523	594
Black Basalt	594	715
Black Red Basalt	715	726
Black Basalt	726	877
Black Brown Green (Water)	877	890
Black Brown Basalt	890	1006
Black Brown Basalt -Fine (Water)	1006	1114
Black Brown Basalt	1114	1200
Black Green Brown Basalt (Water)	1200	1215
Black Green Clay	1215	1360
Black Brown Basalt (Water)	1360	1385
Black Fine Basalt	1385	1500
Fracture Black Basalt	1500	1537
Black Brown Green Basalt	1537	1600
Black Brown Hard Basalt	1600	1655
Black Brown Basalt (Water)	1655	1670
Black Brown Hard Basalt	1670	1720

Work started 4/13/76 19 _____ Completed 4/24/76 19 _____

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is

Odessa GWMA Timeline

1967 Ecology Put the Brakes on:

- **WAC 508-14-010** curtails further groundwater development (1967)
- Ecology Order **DE No. 72-25** establishing GWMA boundaries
- Ecology Order **DE No. 73-32** establishing GWMA rules
- Ecology Lead Agency
- Technical committee: Bureau and Ecology and others

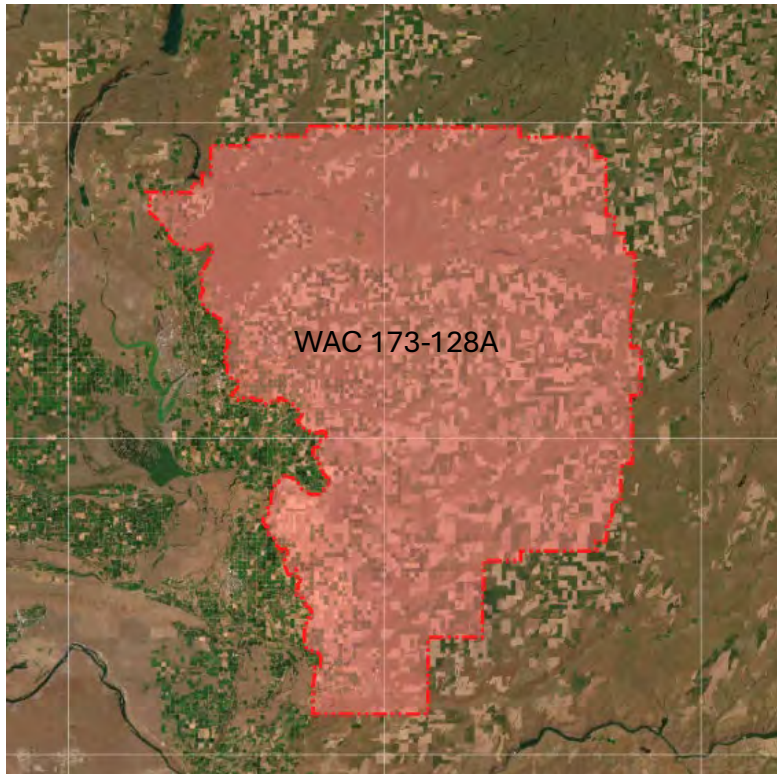
Timeline

- Jan 1974: **WAC 173-128**: Quincy Groundwater Management Subareas and Zones
- Jan 1974: **WAC 173-130**: Odessa Groundwater Management Policy

Odessa GWMA Rules

WAC 173-130A

Odessa Subarea

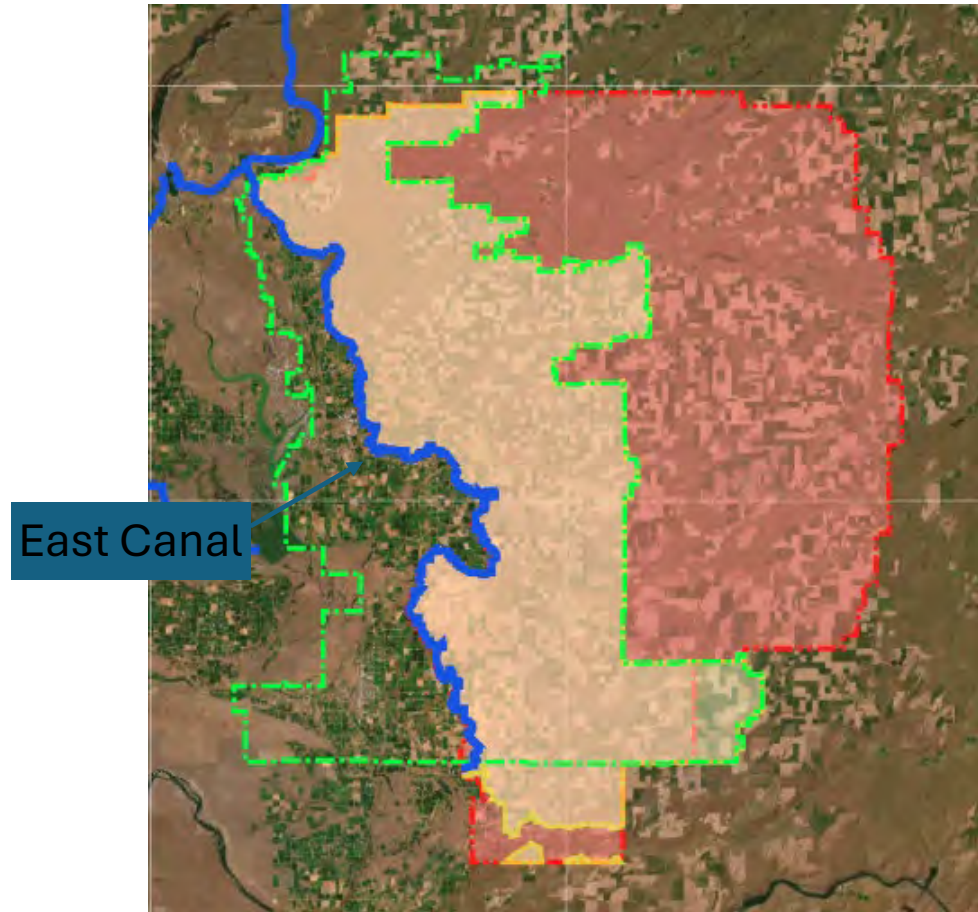


Rules

- Rate of decline in groundwater levels can not exceed 30 ft in 3 years
- Groundwater levels can not decline more that 300 ft from spring 1967 levels
- Water duty is not more than 2.5 AF/acre

Odessa Groundwater Replacement

- 2004 Columbia River Initiative MOU Bureau, Ecology, Districts
- 2005 Federal Funding
- 2006 Office of Columbia River
- 2012 **Odessa Special Study Area EIS**
- Expand the East Canal and build laterals – a huge project
- Essentially a trade – GW for SW
- 70,000 Acres of SW Contracts
- OGWRP is a joint federal-state initiative

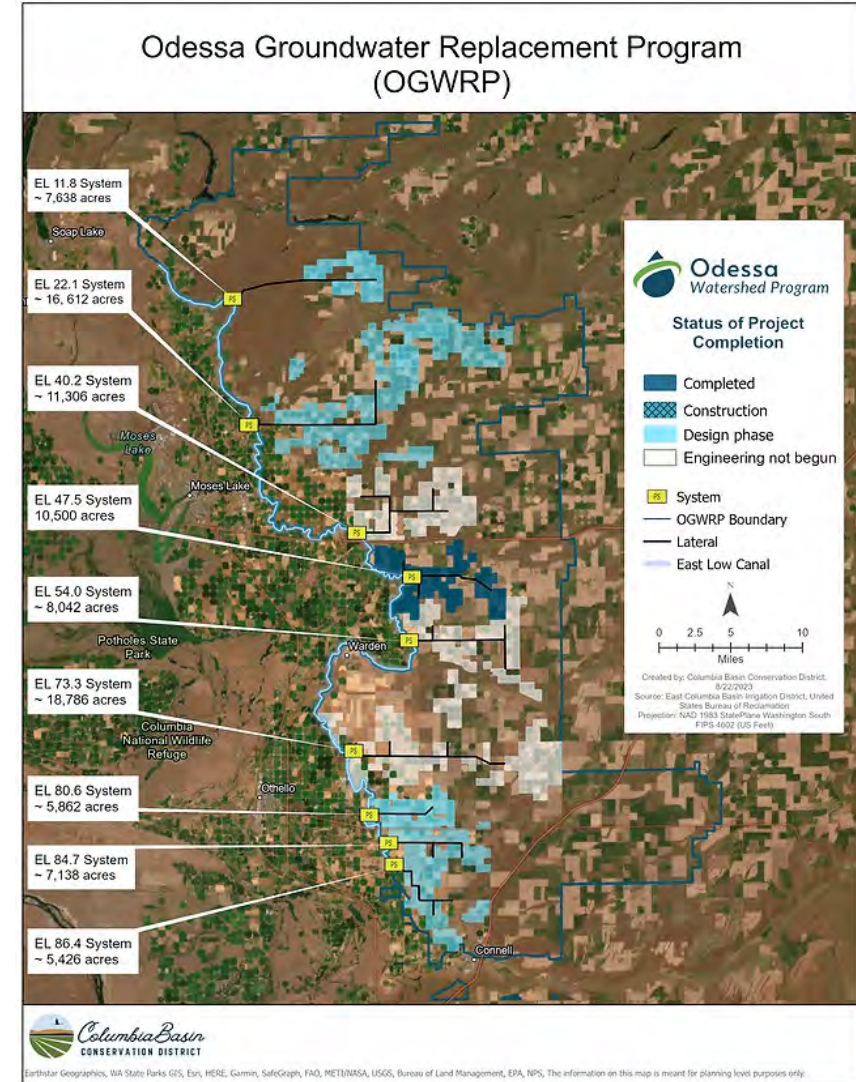


OGWRP

Source: ECBID

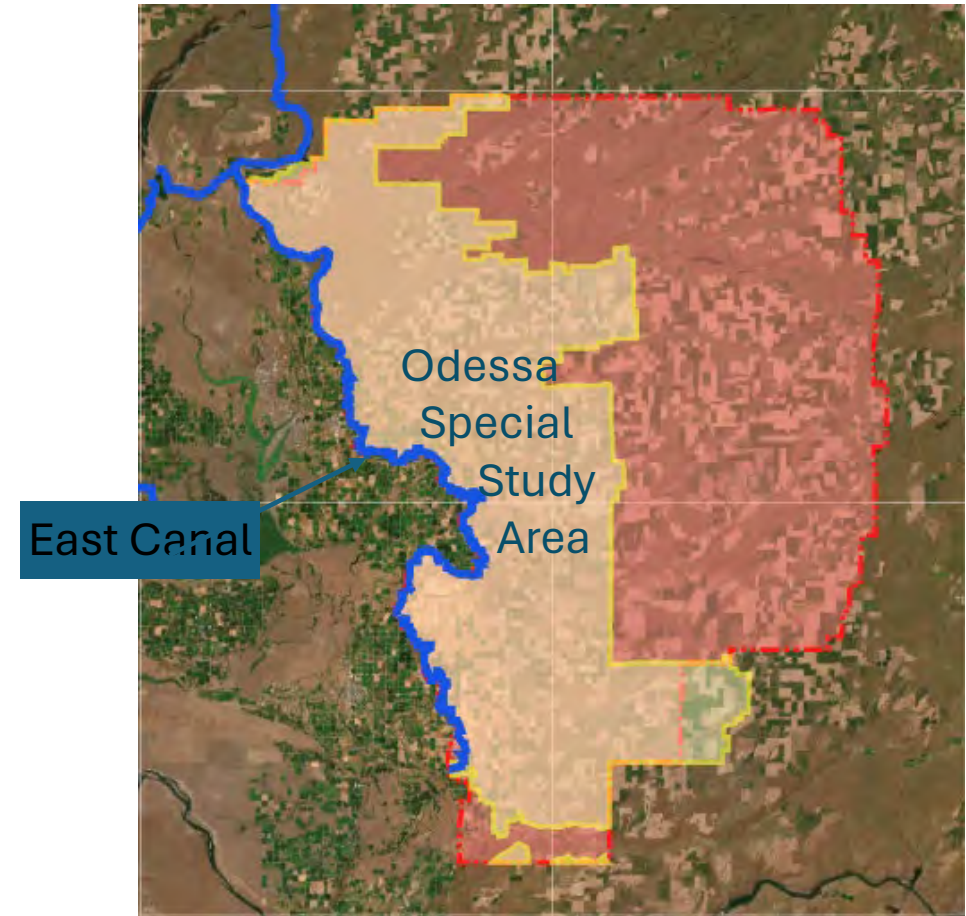
East Low Canal Expansion Construction Activities

- Widen 46 miles of ELC (approx. 3 million CY)
- Construct 7 Siphons (13' to 14'-8" inside dia.)
- Add 7 Radial Gates
- Replace 12 County Rd Bridges

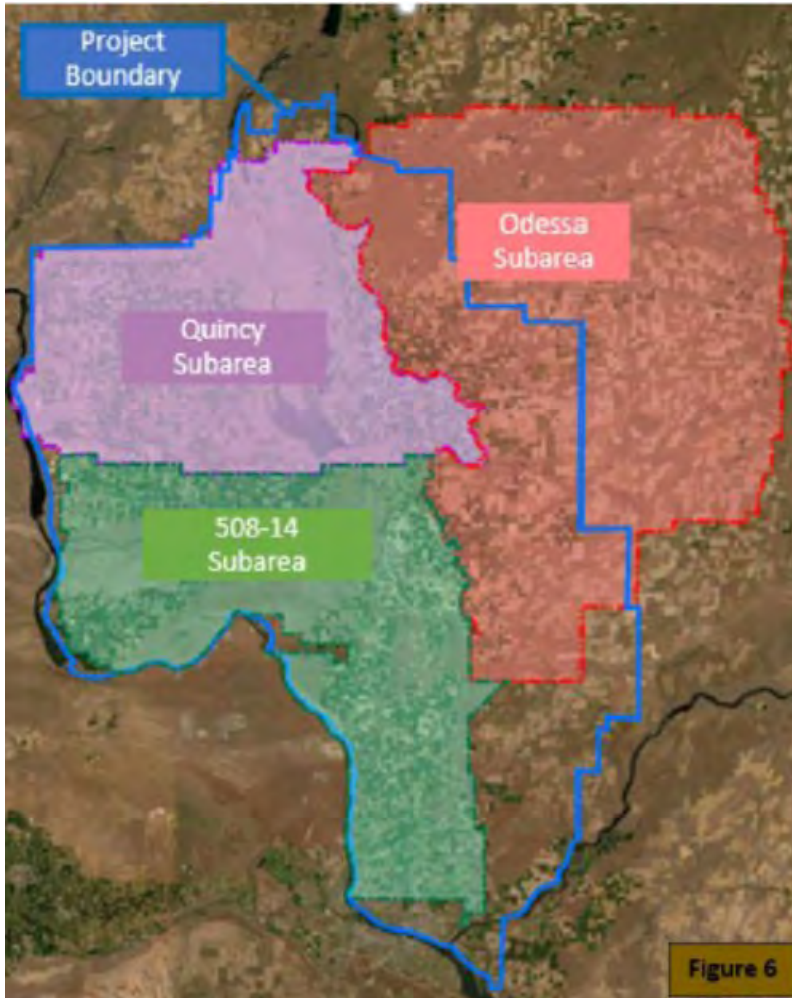


OGWRP Administration

- Eligibility
 - Must have a valid Ecology Odessa GW Permit to “trade”
 - Must have access to a canal lateral in the Special Study Area
 - Must enter into a contract with the ECBID
- Water Market
 - OGWRP In-fill
 - Permit holders without access to a lateral
 - Transfer to properties near laterals

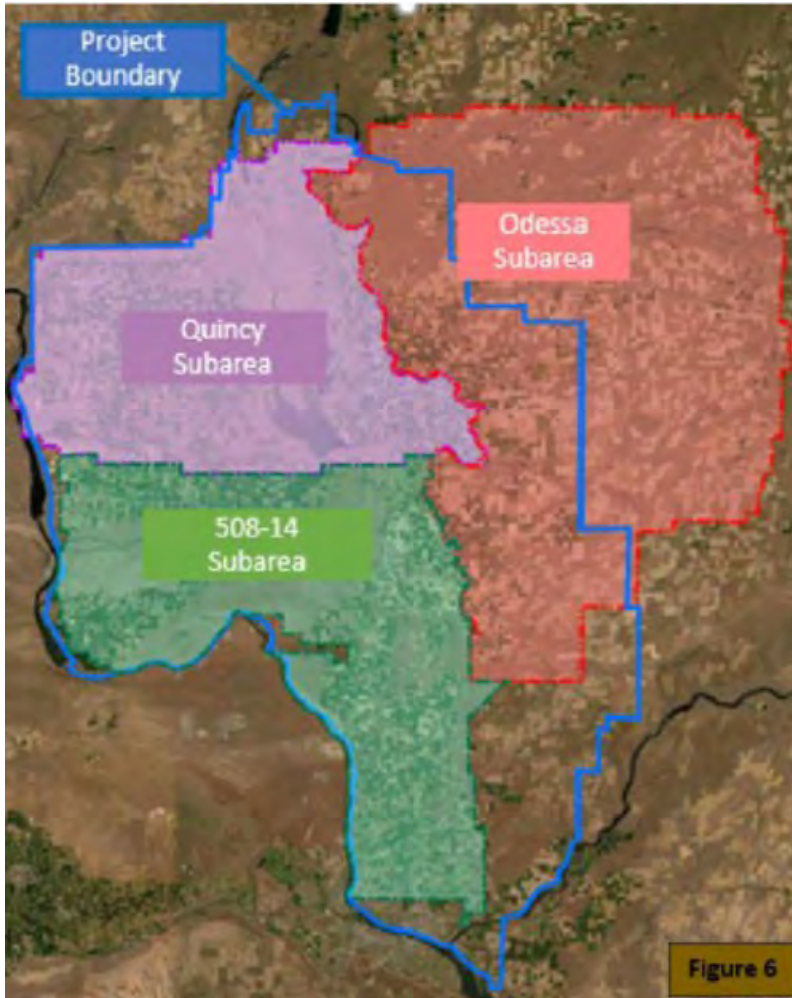


508-14 Subarea



- 1974 – WAC 508-14-030
- 030(2)(a)...(applications) shall be received and permits issued ...however, all such permits shall be conditioned
- 030(2)(b) No certificates of water right as provided of in RCW 90.44.080... shall be issued ...until... a more definite determination can be reached as to the availability of public waters.

508-14 Subarea Artificially Stored GW



Senate Substitute Bill 5230

- Amended RCW 89.12.170
 - Made it easier for Ecology to enter into agreements with Bureau for ASGW
- Next Steps – Ecology rule making
- Entities with an existing application may get consideration

Thank You

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