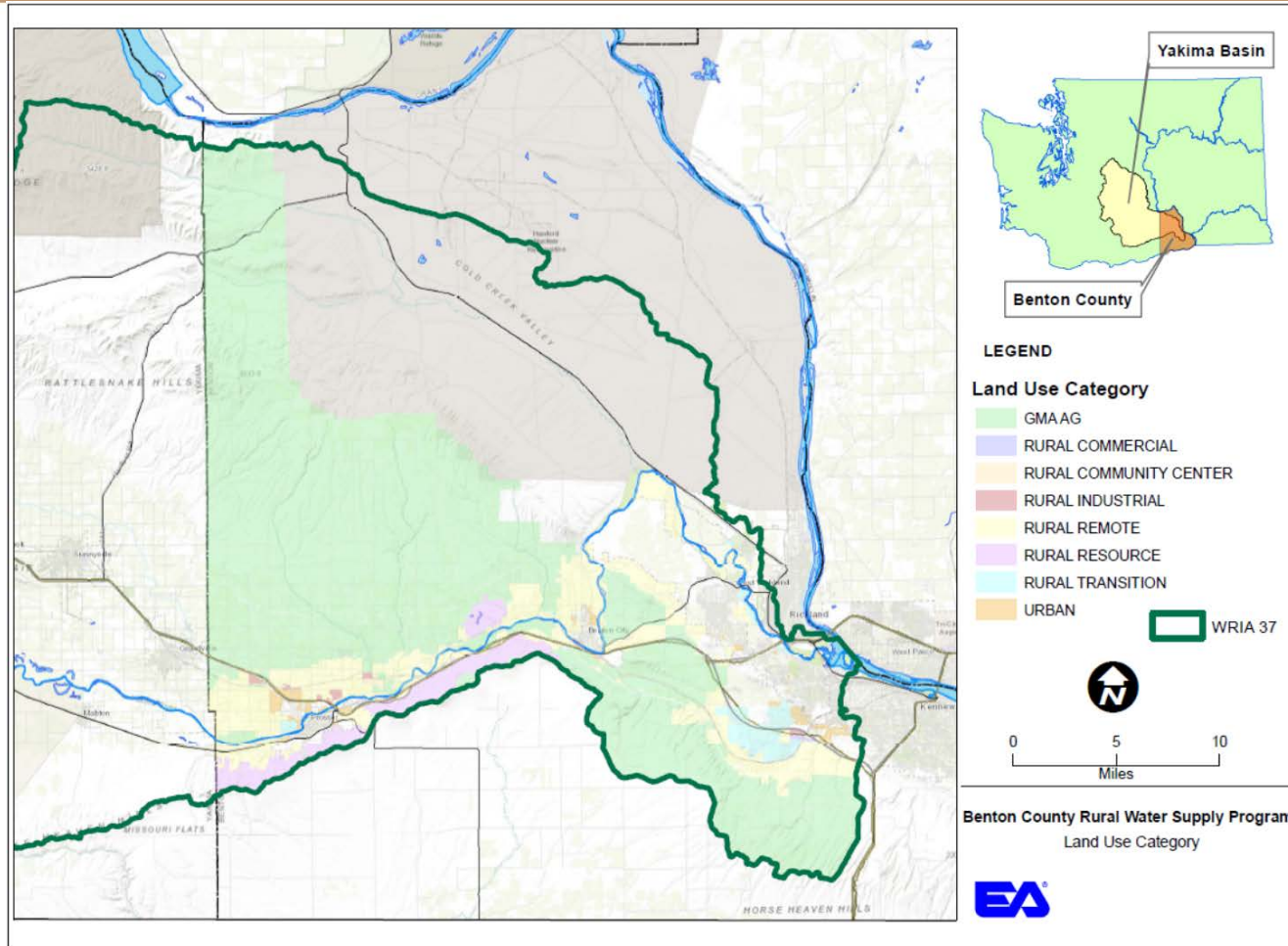


Benton County Rural Water Supply Program – Update to WTWG



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CONSULTING

GEOENGINEERS

EA EA Engineering,
Science, and
Technology, Inc., PBC

Agenda

Presentation Purpose – Status on Rural Water Supply Program Development

- Background and Context
- Technical Study
- Demand Forecast and Mitigation Estimate
- Draft Program Elements
- Status and Next Steps

Background and Context

- Feb. 2017 Ecology letter encouraging action on rural supply mitigation in Comp. Plan update
- Rural supply element added to updated Plan
- FutureWise challenged plan on rural water and a few other topics
- County working on FutureWise Settlement Agreement and Rural Water program
- Technical Team guiding County

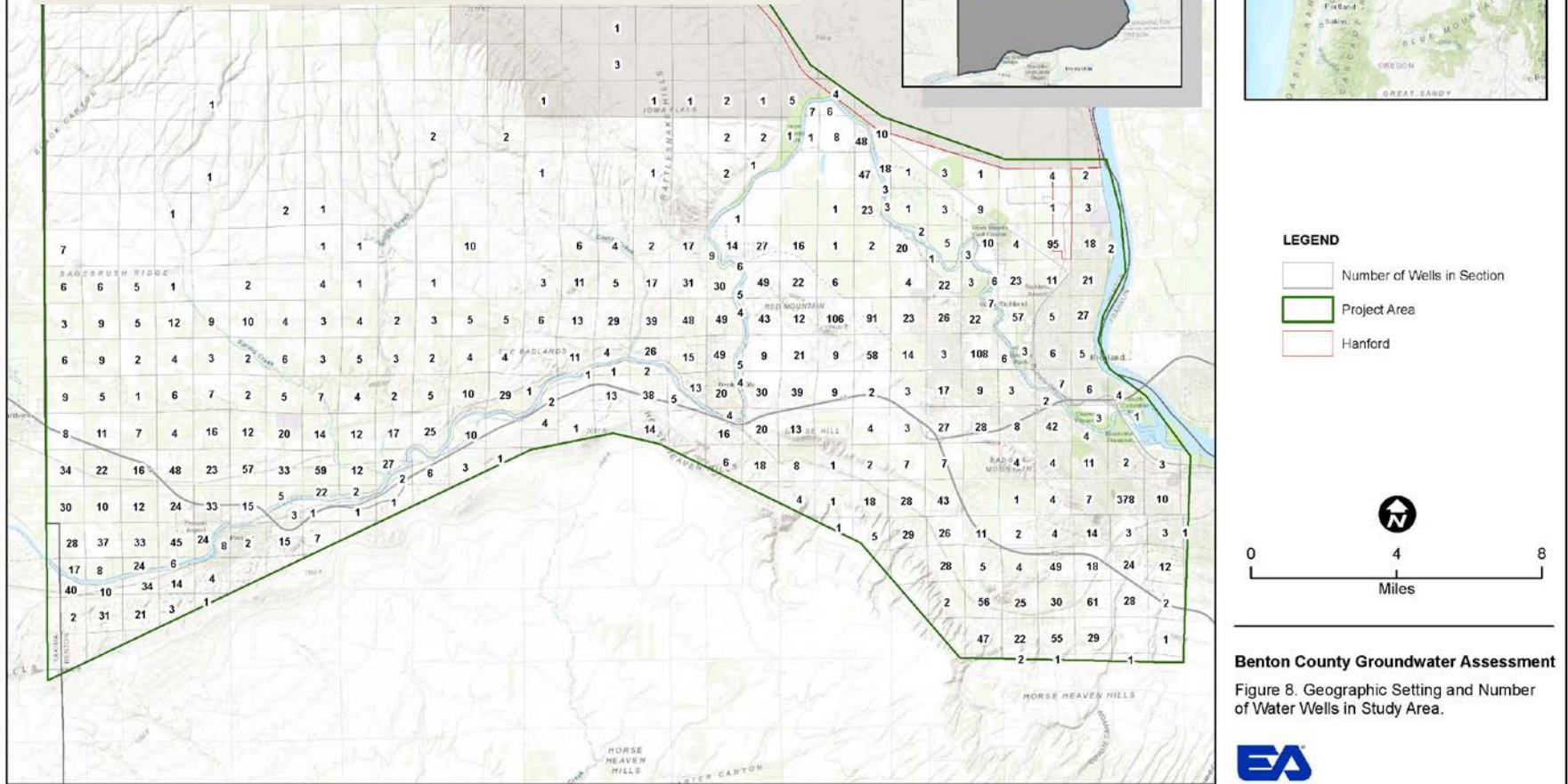
Technical Study

Technical Study – Characterize Groundwater Conditions

- Yakima basin portion of Benton County (lower WRIA 37)
- Primarily water level focus
- Based on available info: USGS, Ecology EIM, Benton County
- Does not include incorporated areas
- Work done by EA team now at GeoEngineers

Wells in Project Area

- Hundreds of permit exempt wells
- Predominantly rural residential



- Have a few dozen wells in the project area



Declining Water Levels Normal

Table 1. Wells Used for This Study

Location ID	Well Tag ID	Open Interval Top (ft)	Open Interval Bottom (ft)	Unit	Average Annual Water Level change (feet/year)	Comments
CRGWDB-203523		204	315	A		
CRGWDB-201734		235	335	S	0.14	slight upward trend
CRGWDB-210964		79	79	S	-0.25	
CRGWDB-210958		23	325	S	-0.30	
CRGWDB-210962		14	140	S	-0.57	
CRGWDB-210963		20	142	S	-0.78	
CRGWDB-201729		235	320	S	-0.93	
CRGWDB-201804		304	354	S	-1.46	
CRGWDB-210967		230	376	S	-5.06	most of decline early in data record
CRGWDB-202252		150	620	S/I	-0.13	
CRGWDB-201999		200	425	S/I	0.52	
CRGWDB-201735		194	645	S/I	-0.65	
CRGWDB-203064		72	560	S/I	-0.72	
AFB355	AFB355	68	560	S/I	-0.90	trend not well developed
CRGWDB-202022		21	532	S/I	-3.71	
CRGWDB-202003		195	468	S/I	0.00	trend not well developed
CRGWDB-202067		406	446	I	0.00	
CRGWDB-203103	BJA370	650	720	I	-0.74	
CRGWDB-203100		575	758	I	-2.12	
CRGWDB-203370	BJA369	818	900	I	-2.14	
CRGWDB-203028		406	705	I	-2.54	
CRGWDB-210961		504	533	I	-3.56	
CRGWDB-203240		825	880	I	-3.83	-2.13
CRGWDB-200607		560	1510	I/D	-2.28	
CRGWDB-201989	BBJ599	730	1200	I/D	-3.16	
CRGWDB-203576		768	1475	I/D	-3.56	-3.00
AAL542	AAL542	949	1371	D	-2.15	
AHP787/297	AHP787/297	1160	1645	D	-2.40	
CRGWDB-210959		928	1308	D	-3.11	
AAL543	AAL543	978	1300	D	-3.23	-2.72

A= Alluvial

S= Shallow Basalt

S/I= Shallow/Intermediate Basalt

I= Intermediate Basalt

I/D= Intermediate/Deep Basalt

D= Deep Basalt



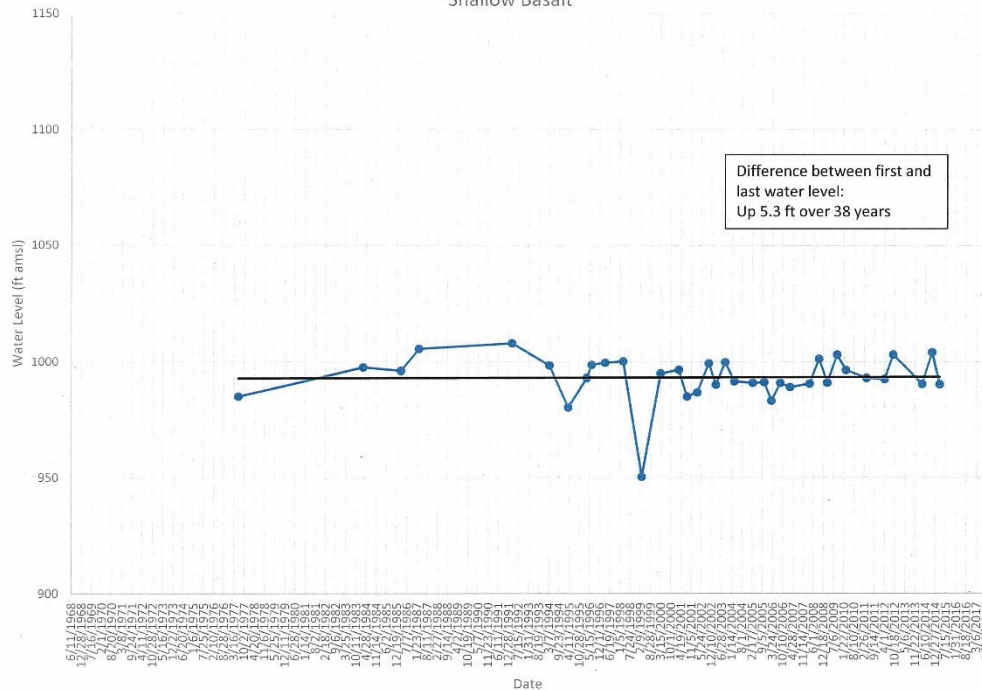
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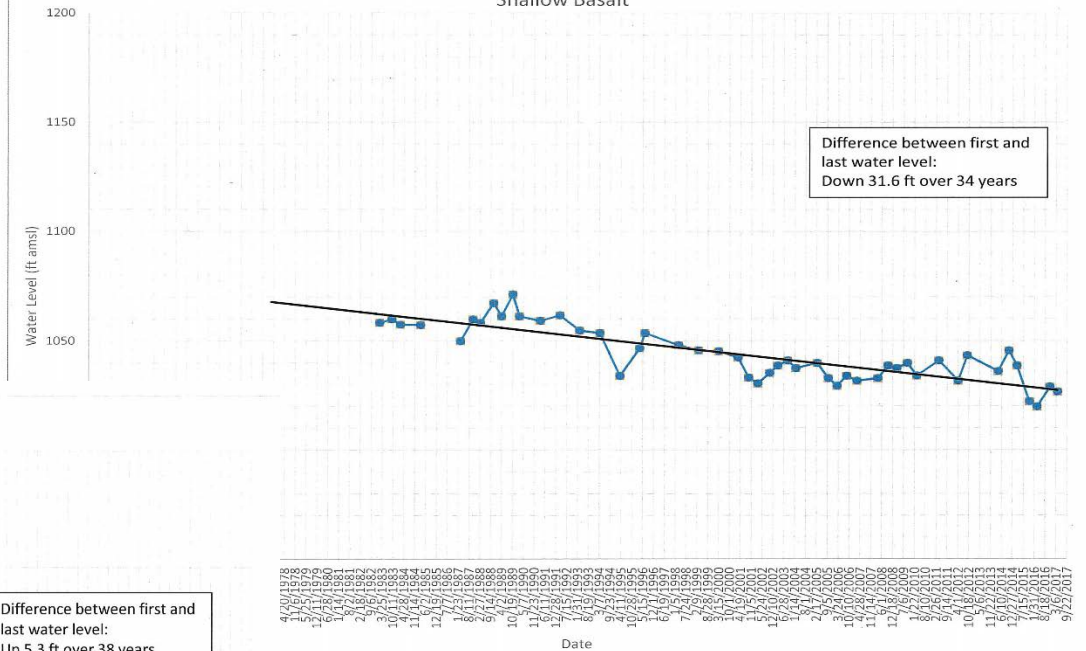
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Shallow Basalt

CRGWDB-201734
Shallow Basalt



CRGWDB-201729
Shallow Basalt

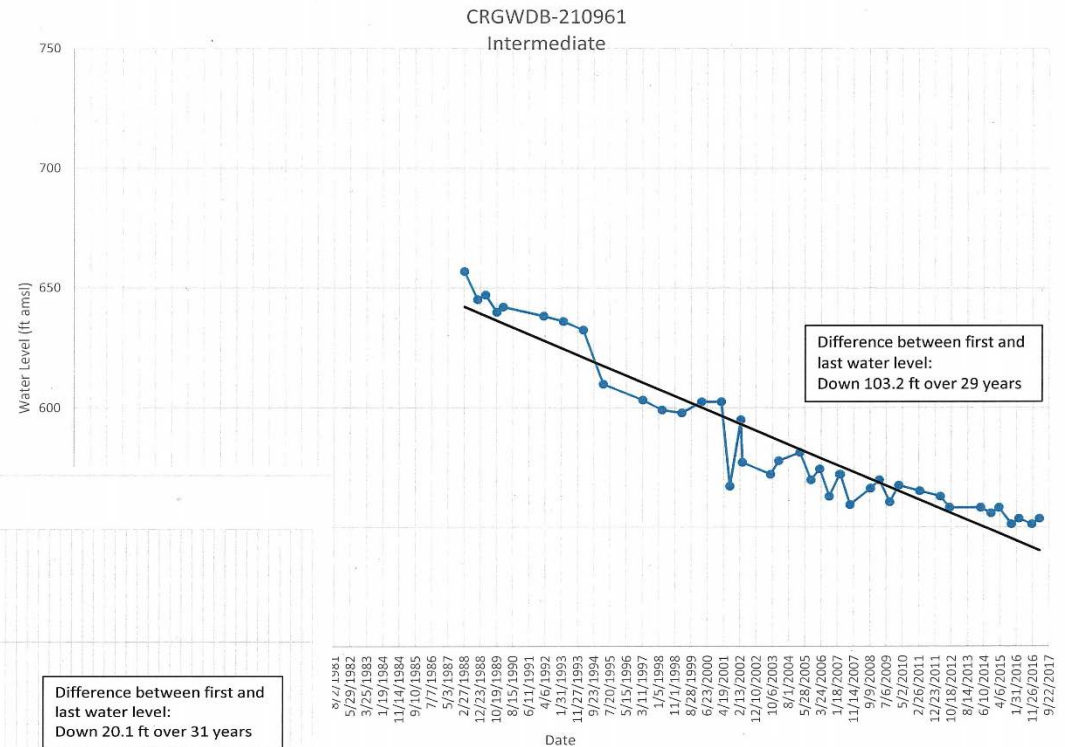
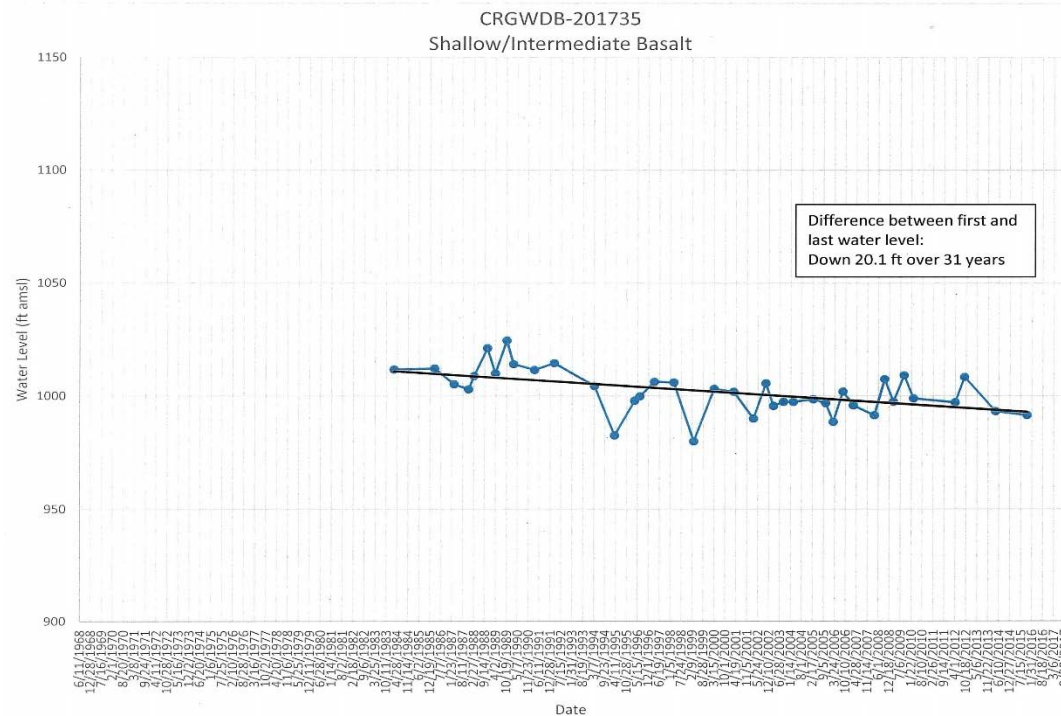


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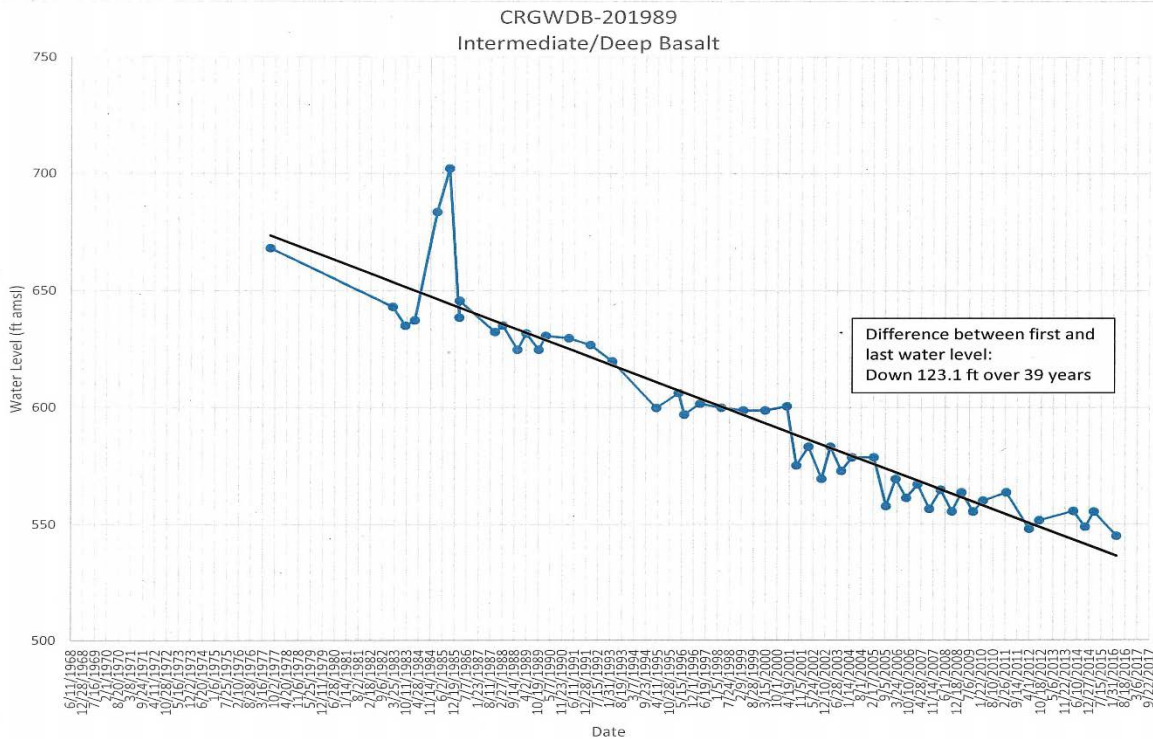
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Shallow to Intermediate



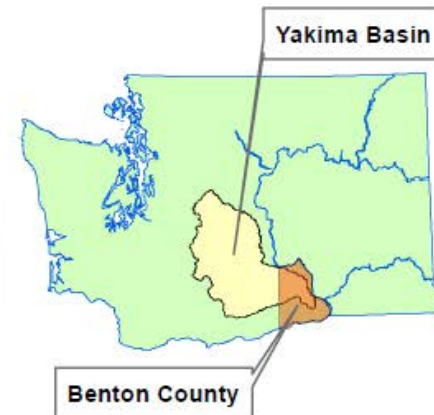
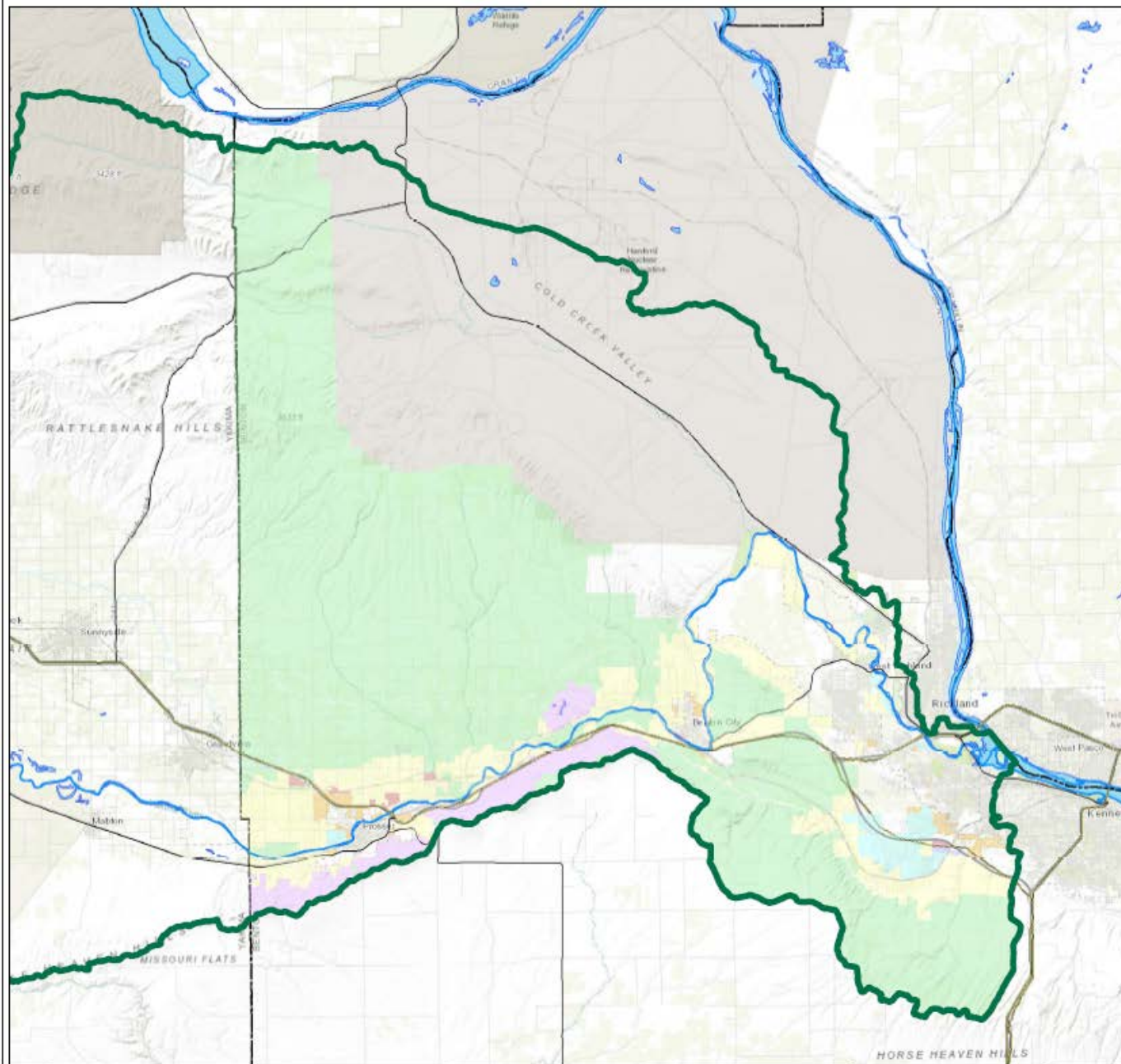
Intermediate to Deep



Conclusions

- Alluvial is laterally restricted and low yield
- Most basalt wells with long-term data show declines
- Less in shallow
 - Less high capacity pumping?
 - Higher potential recharge and surface connection?
- More in deep
 - More high capacity pumping?
 - Lower potential recharge and surface connection?

Demand Forecast and Mitigation Estimates (2018 – 2038)



LEGEND

Land Use Category

- GMA AG
- RURAL COMMERCIAL
- RURAL COMMUNITY CENTER
- RURAL INDUSTRIAL
- RURAL REMOTE
- RURAL RESOURCE
- RURAL TRANSITION
- URBAN

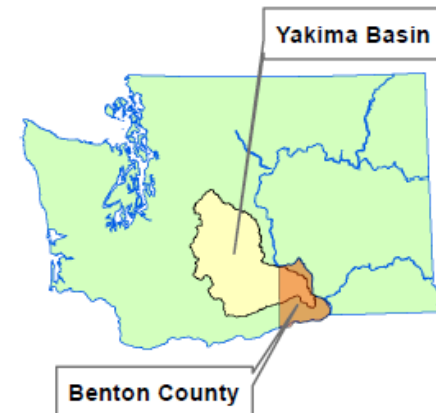
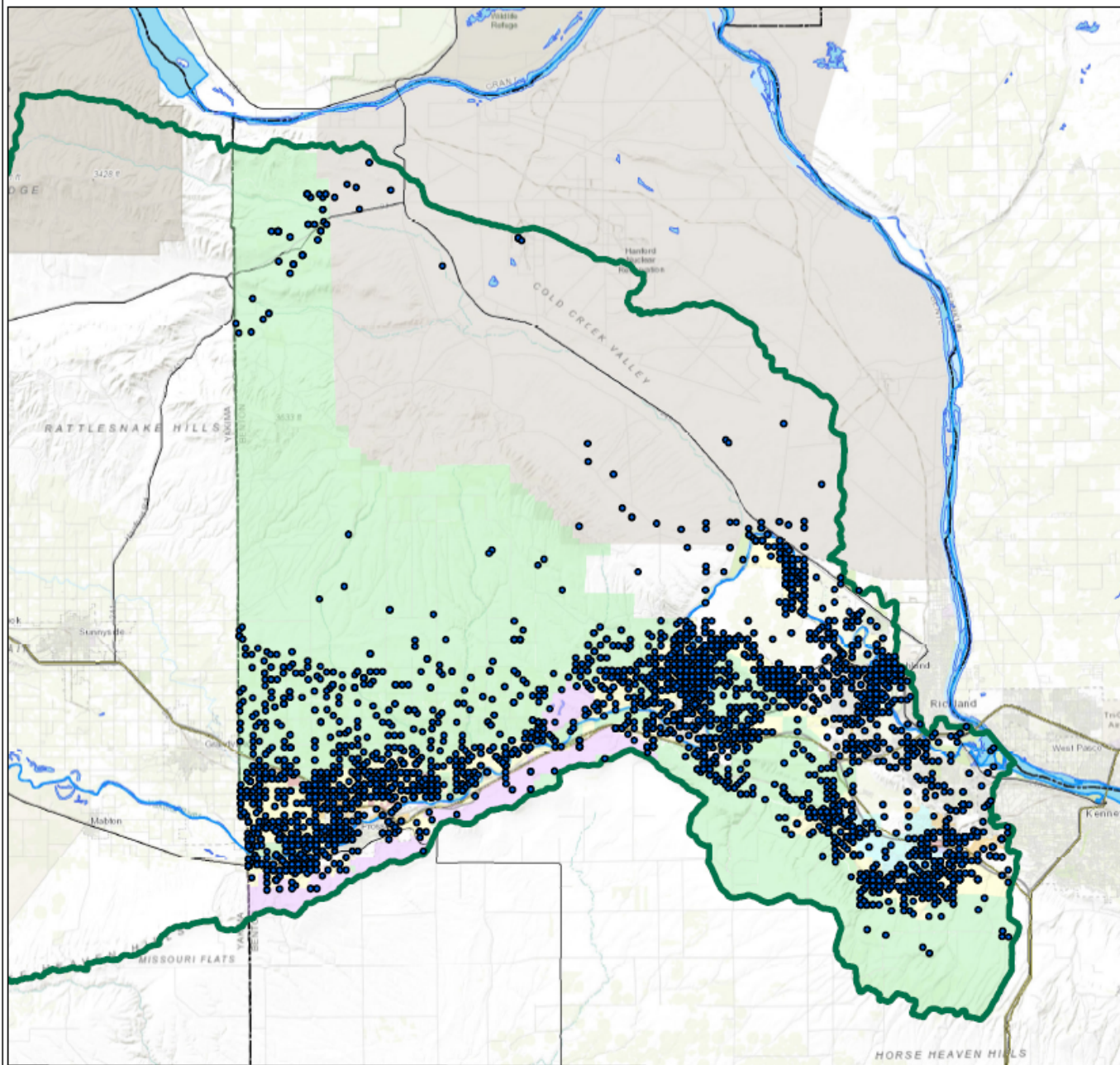
WRIA 37



0 5 10
Miles

Benton County Rural Water Supply Program
Land Use Category





LEGEND

Land Use Category

- GMAAG
- RURAL COMMERCIAL
- RURAL COMMUNITY CENTER
- RURAL INDUSTRIAL
- RURAL REMOTE
- RURAL RESOURCE
- RURAL TRANSITION
- URBAN

• Water Well Log

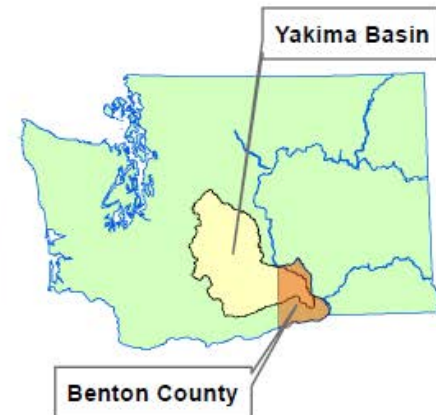
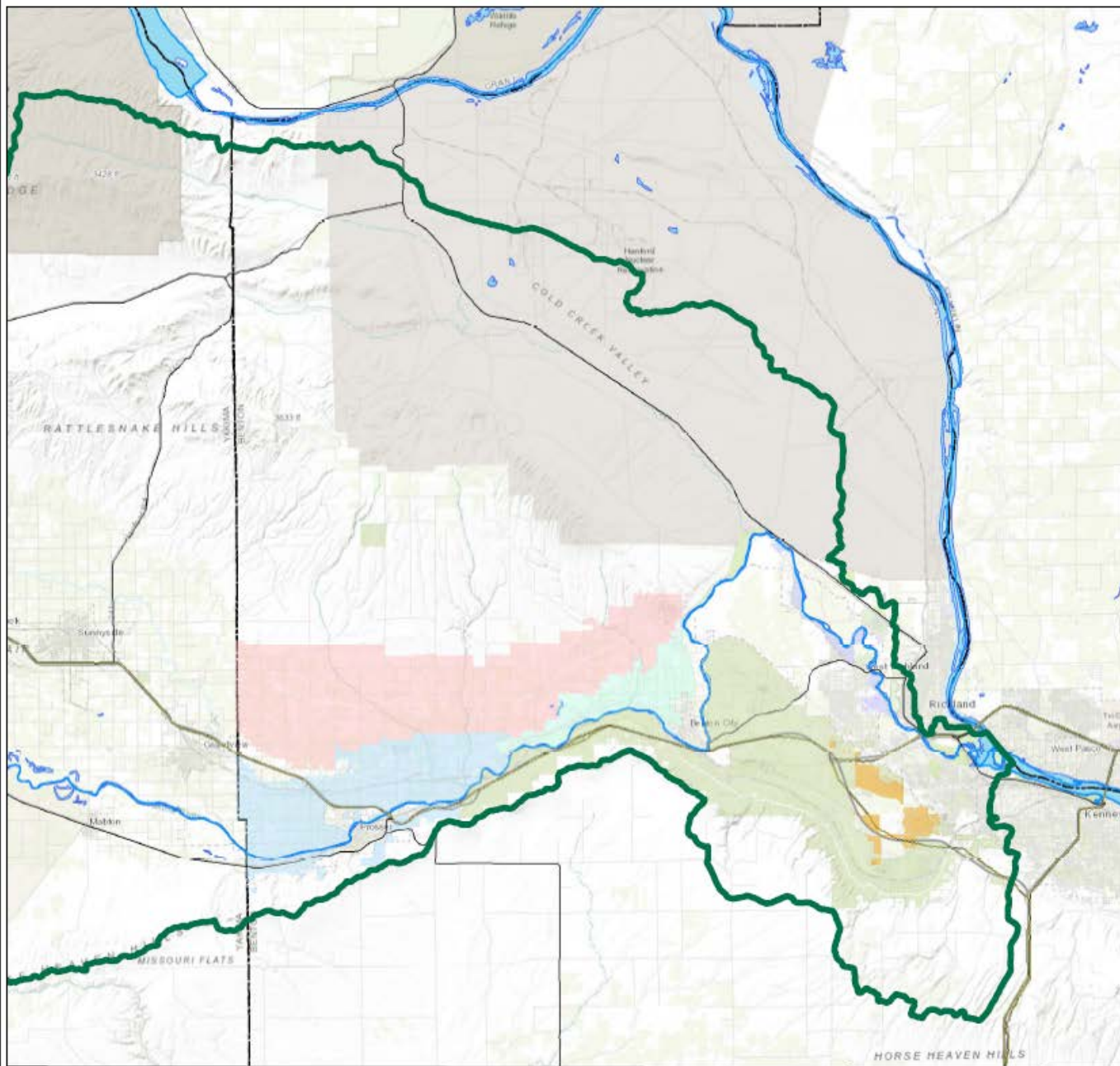
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Benton County Rural Water Supply Program
Land Use Category and Water Wells





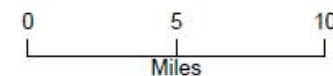
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Irrigation District

- Badger Mountain
- Benton
- Columbia
- Kennewick
- Roza
- Sunnyside Valley

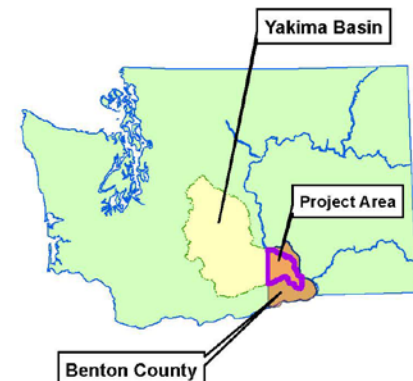
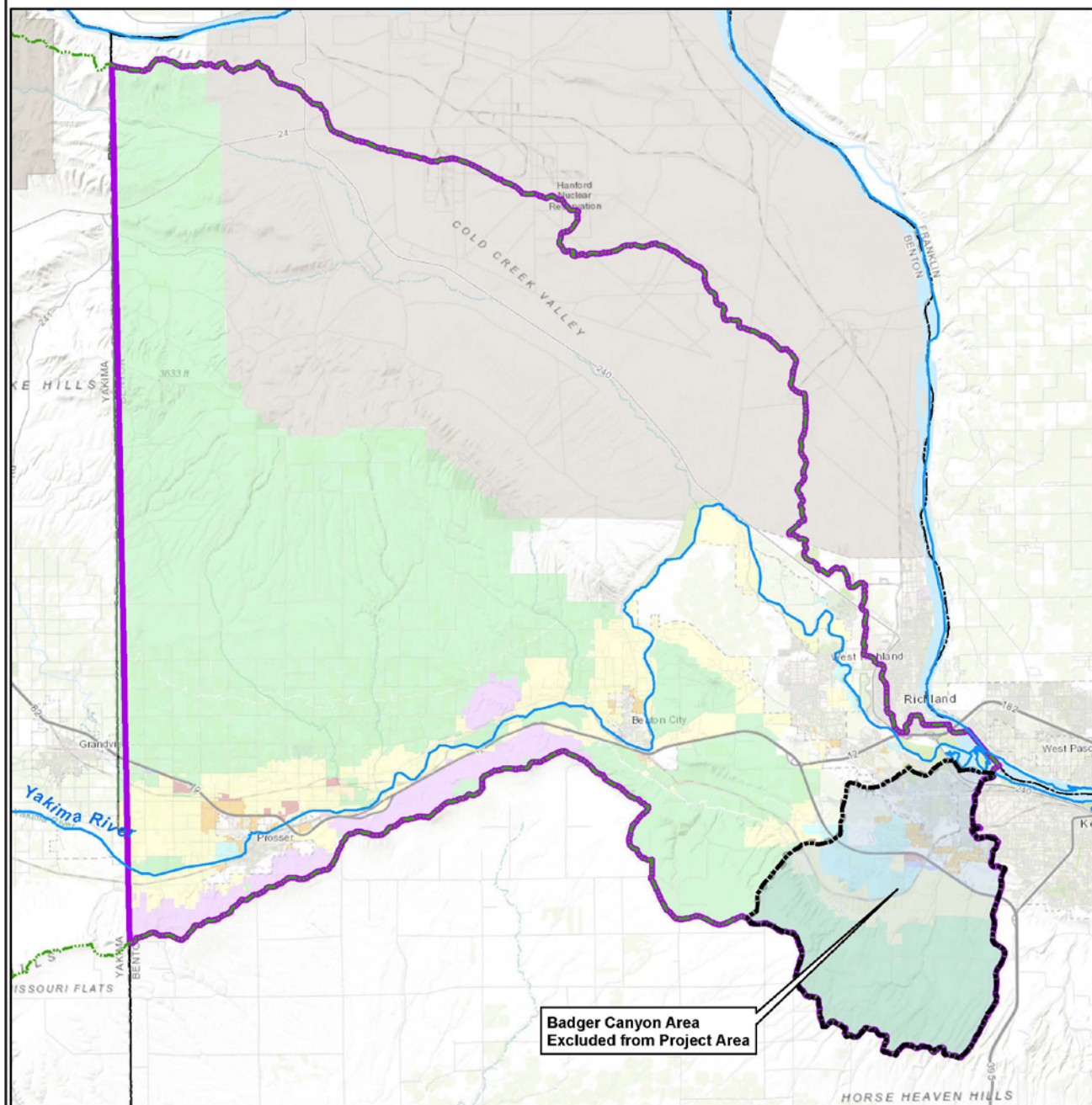


WRIA 37



Benton County Rural Water Supply Program
Irrigation Districts in Project Area





Land Use Category

Rural Remote	GMA Ag
Rural Resource	Rural Commercial
Rural Transition	Rural Community Center
Urban	Rural Industrial

Yakima Basin Project Area



0 4.5 9
Miles

Benton County Rural Water Supply Program
Figure 1 - Project Area



Growth for Entire Benton County

Table 1 - Potential Future Rural Population Growth by Land Use Category
(Table 3-7 in Comprehensive Plan)

Land Use Category*	New Units
Urban	134
Rural Transition	1,142
Rural Remote	5,652
Rural Community Centers	34
Total	6,961

*Data represents all of rural Benton County.

- Approx. 18,800 population increase
- 6,961 Households (2.7 per household)

Growth for Mitigation Area

Table 2 - Range of Projected Rural Residential Growth Rates

	County	Modified Project Area	Modified Project Area 20-yr Total
Low Estimate*	205/yr	64/yr	1280
High Estimate^	348/yr	109/yr**	2176

* Rate based on 2013-2018 building permit data

^ Rate based on County Comprehensive Plan

** Assumes pattern of observed growth will not change (36.5% of total growth will occur in modified project area)

- Projecting 64 to 109 new households per year

Washington Irrigation Guide

Table 3 – Pasture/Turf Irrigation Requirements in inches (Appendix A, Washington Irrigation Guide, USDA, 1997)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Prosser	0	0	0	0.75	5.88	7.27	9.27	7.57	4.91	1.64	0	0	37.29
Richland	0	0	0	0.88	6.59	8.05	10.31	8.36	5.49	2.07	0	0	41.75

- Different requirements for western vs eastern part of County
- Divided mitigation area into two parts and also within or outside irrigation district service area



Projected Water Use Values

Table 5 - Total Household Water Use in Gallons per Day

			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total (Gallons)	Annual Daily Ave (GPD)	Annual Total (Acre-Ft)
Indoor Use Only			162	162	162	162	162	162	162	162	162	162	162	162	59,171	162	0.18
Indoor + Outdoor Water Use	Prosser	¹ / ₁₂ Acre	162	162	162	219	591	710	839	715	532	282	162	162	143,714	393	0.44
		¹ / ₄ Acre	162	162	162	332	1,450	1,807	2,192	1,820	1,273	521	162	162	312,478	856	0.96
		¹ / ₂ Acre	162	162	162	501	2,737	3,452	4,222	3,477	2,384	880	162	162	565,624	1,549	1.74
	Richland	¹ / ₁₂ Acre	162	162	162	228	643	769	915	772	576	313	162	162	153,807	421	0.47
		¹ / ₄ Acre	162	162	162	361	1,605	1,984	2,420	1,993	1,404	615	162	162	342,755	938	1.05
		¹ / ₂ Acre	162	162	162	560	3,048	3,805	4,677	3,823	2,647	1,069	162	162	626,178	1,714	1.92

- Indoor Only – Estimated 162 GPD/.18 AF
- Outdoor Varies by Location in Mitigation Area

Estimated Consumptive Use

Table 6 - Total Household Consumptive Water Use in Gallons per Day

			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total (Gallons)	Annual Daily Ave (GPD)	Annual Total (Acre-Ft)
Indoor Use Only			32	32	32	32	32	32	32	32	32	32	32	32	11,688	32	0.04
Indoor + Outdoor Water Use	Prosser	¹ / ₁₂ Acre	32	32	32	83	419	526	641	530	366	140	32	32	87,810	240	0.27
		¹ / ₄ Acre	32	32	32	185	1,191	1,513	1,859	1,524	1,032	356	32	32	239,698	656	0.74
		¹ / ₂ Acre	32	32	32	338	2,350	2,994	3,686	3,016	2,032	679	32	32	467,529	1,280	1.43
	Richland	¹ / ₁₂ Acre	32	32	32	92	465	579	710	582	405	168	32	32	96,893	265	0.30
		¹ / ₄ Acre	32	32	32	212	1,331	1,672	2,064	1,680	1,150	440	32	32	266,947	731	0.82
		¹ / ₂ Acre	32	32	32	391	2,630	3,311	4,096	3,328	2,269	848	32	32	522,028	1,429	1.60

- Indoor Consumption – 20 percent
- Outdoor Consumption – 90 percent

Range for Mitigation: 2018 - 2038

Table 7 - Estimated Consumptive Use (Acre-Feet)

Growth Rate	Indoor Only		Indoor + $\frac{1}{12}$ acre	
	Annual	20 Year	Annual	20 Year
Low	2.30	46	9.26	185
High	3.91	78	15.37	307

- Minimum Indoor – 46 AF
- Upper Amount – 307 AF

Securing Mitigation Water

- 75 AF of consumptive water acquired in October 2018 (former Boise-Cascade site in Yakima)
- Ecology maintaining existing trust water right conditions (with seller) until County/Ecology Trust Water Right Agreement put in place
- County actively seeking to purchase other rights

Draft Program Elements

Draft Program Elements

- Reserved mitigation water for households in mitigation area permitted between Feb 2018 and date program approved (spring 2019?)
- Mitigation Packages (*values subject to change*)
 - A = 200 GPD indoor with 675 GPD max
 - B = 200 GPD indoor + 100 GPD outdoor with 900 GPD max (for up to 1500 square feet for outdoor irrigation)

Draft Program Elements

- To meter or not to meter? That is the question
- Two different camps within Technical Team
- Looking at metering costs and program in Kittitas Co (and Yakima too)
- Outlining alternate accounting approach that estimates usage using GIS and assumed values
- Evaluate pros and cons
- County Commissioners to make final decision

Status and Next Steps

Status and Next Steps

- Finalize FutureWise Settlement Agreement – perhaps by end of February or early March
- Outreach meeting March 1 with Tri-Cities Home Builders and Realtors associations
- Technical Team meeting on March 4
- Internal county meeting and Board of County Commissioners workshops

Status and Next Steps

- Select preferred accounting approach and describe annual reporting to Ecology and WTWG
- Define other program elements in more detail
- Secure additional water rights
- Establish program by summer 2019

Additional Questions/Comments?