

History of Progress in the Lower Yakima Valley GWMA

2002 VIRE Study

- The Valley Institute for Research and Education (VIRE) sampled 249 wells for nitrate, bacteria, arsenic, chloride, ammonia, ferrous iron and field parameters. Twenty-one percent of the wells sampled in the eastern part of the Lower Yakima Valley exceeded the drinking water standard for nitrate.

- Quality of Ground Water in Private Wells in the Lower Yakima Valley, 2001-02

2008 Hidden Wells, Dirty Water

- The Yakima Herald Republic ran a series of articles, by Leah Beth Ward, and requested that the EPA invoke section 1431 of the Safe Drinking Water Act to address groundwater nitrate contamination. EPA's response indicated that they were interested in applying the collective resources and tools of the agencies that have a role in groundwater management as a first step.

- **Hidden Wells, Dirty Water, 2008**



2010 Preliminary Assessment

- A team from multiple agencies, evaluated existing data in the Lower Yakima Valley and estimated that over 2,000 people were exposed to nitrate over the drinking water standard.
 - They also developed a list of recommendations and a strategy for progress based on the information gathered from the public forum meetings in 2008.
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- Lower Yakima Valley Groundwater Quality, Preliminary Assessment and Recommendations, 2010



2011 Nitrate Treatment Pilot Program

- Yakima County developed a treatment program for households where there was a health risk from nitrate contamination.


- **7,600 homes** were mailed public education and technical assistance information.

- **1,870 homes** returned nitrate test strips.

- **177 homes** were able to have reverse osmosis treatment systems installed.

- **100 homes** received free water testing from a certified lab.

- Lower Yakima Basin, Nitrate Treatment Pilot Program Final Report, 2011




2011 Request for Identification of a GWMA in the Lower Yakima Valley

- This is the formal request submitted by Yakima County to Ecology, to designate the Lower Yakima Valley as a GWMA under Chapter 173-100 WAC.
- This document describes the problem, the goals, objectives, recommended advisory committee members, associated costs, and potential funding options.

· **Request for Identification, Lower Yakima Valley Groundwater Management Area, 2011**

2011 GWMA Formed



The Yakima County Commissioners chose to establish a Groundwater Management Area (GWMA) to manage this issue, and signed an interagency agreement with the Washington Department of Ecology (Ecology).



GWMA Committee (2011 - 2019)


- The GWMA committee held public meetings monthly for six years. Additionally, the committee formed 7 workgroups to focus on specific issues: 1) Education and public outreach, 2) Data collection, characterization and monitoring, 3) Livestock and CAFO (concentrated animal feeding operations), 4) Irrigated agriculture, 5) Residential, commercial, industrial and municipal sources (RCIM), 6) Regulatory framework, and 7) Funding.
- The committee chose to use credible data and valid scientific protocols to assist with making decisions.

2014 Groundwater Monitoring Plan and Quality Assurance Project Plan

- [Final Groundwater Monitoring Plan, Lower Yakima Valley GWMA, 2014](#)

2014 Deep Soil Sampling

- [Deep Soil Sampling Plan, Lower Yakima Valley GWMA, 2014](#)



2016 Proposed Ambient Groundwater Monitoring Network Plan

- [Lower Yakima Valley GWMA Proposed, Ambient Groundwater Monitoring Network, 2016](#)

2017 Drinking Water Well Study

- [Concentrations of Nitrate in Drinking Water in the Lower Yakima River Basin, GWMA, Yakima County, Washington, 2017](#)

- [Quality Assurance Project Plan, Nitrate in Groundwater of the Yakima River Basin, 2017](#)

2018 Nitrogen Availability Assessment

- [Estimated Nitrogen Available for Transport in the Lower Yakima Valley GWMA, 2018](#)

2019 Installation of Monitoring Wells

- [Lower Yakima Valley GWMA Ambient Groundwater Monitoring Well Installation Report, 2019](#)



2019 GWMA Program

- The information gathered during the GWMA planning phase, along with the accomplishments, are compiled in Lower Yakima Valley Groundwater Management Program. The GWAC unanimously approved the Program in 2019, which includes 64 prioritized recommended actions to achieve the goal of reducing nitrate concentrations in groundwater.

- [Executive Summary](#)
- [Volume I](#)
- [Volume II-Appendices](#)
- [Volume III-Accomplishments](#)
- [Volume IV-Member](#)

[Contributions](#)

- Certified by Ecology July 2019:
[Request to Certify Lower Yakima Valley Groundwater Management Area Program](#)

Education and Outreach

- “What You Can Do” brochures
- Health Care Provider Questionnaire on Methemoglobinemia
- Public Opinion Survey
- Handouts on well maintenance, nitrates, coliform bacteria, septic systems, methemoglobinemia, babies and water, and testing laboratories.
- 2014 High Risk Well Testing
- Public Service Announcements and Billboards

More information about the GWMA is available at:

- Ecology websites:
[Lower Yakima Valley Groundwater | Washington State](#)

Department of Ecology

· Yakima County website:

[Lower Yakima Valley Groundwater Management Area | Yakima County, WA](#)

[Groundwater Management | Yakima County, WA](#)

· GWMA map:

[Groundwater Management Area Boundary Map | Yakima County, WA](#)

GWMA Authority (RCW and WAC)

· [RCW 90.44.400 - Groundwater Management Areas: Purpose, Standards, Identification, and Designation](#)

· [Chapter 173-10 WAC, Groundwater Management Areas and Programs | Yakima County, WA](#)



Hops growing in the Lower Yakima Valley. Hops are one of the agricultural commodities grown in the Lower Yakima Valley accounting for approximately 75% of the nation's hops.

Nitrate Sampling Program of Private Domestic Wells	Agency	Year	Number of Samples Collected	Number greater than 10 mg N/L	Percentage greater than 10 mg N/L
Before the GWMA was Formed					
Valley Institute for Research and Education (VIRE)	Private	2002	249		21%
Nitrate Treatment Pilot Program Lab Results	Yakima County	2011	271	152	56%
Nitrate Treatment Pilot Program Nitrate Test Strips	Yakima County	2011	1870	180	10%
During the Planning Stage of the GWMA					
Relation between nitrate in wells and sources	EPA	2012	331		20%
Drinking Water Quality Assessment	USGS	2017	156		26%
During the Implementation Stage of the GWMA					
Ambient Groundwater Monitoring Network	Ecology	2021 Summer	134	20	15%
Ambient Groundwater Monitoring Network	Ecology	2021 Fall	134	17	13%
Ambient Groundwater Monitoring Network	Ecology	2022 Winter	134	23	17%
Total =			3,285		

This table summarizes the different studies that were conducted, total number of homes sampled and the percentage of wells that exceed the drinking water standard in additional studies.

Previous Groundwater Sampling Efforts

Efforts to assess nitrate contamination in private domestic wells and inform residents

Other groundwater sampling efforts that occurred before the GWMA was formed, helped define the extent of nitrate contamination in private domestic wells and its effects to residents.

2002 VIRE Study

In **2002** the Valley Institute for Research and Education (VIRE) sampled 249 private wells to inform residents about the quality of their drinking water. They found approximately 21% of the wells exceeded the drinking water standard.

[Quality of Ground Water in Private Wells in the Lower Yakima Valley, 2001-02](#)

2011 Nitrate Treatment Pilot Program

In **2011**, Yakima County initiated the Nitrate Treatment Pilot Program. This program delivered over 7,600 nitrate test strips along with a flyer (in both English and Spanish), to every home in the GWMA. Almost 25% (1,870) of the homes returned the test strips, with 152 homes (9%) exceeding the drinking water standard of 10 mg N/L. Additionally, 271 homes had water samples sent to a laboratory, with 180 of these exceeding the drinking water standard. Based on the results of this sampling and outreach effort, 168 reverse osmosis treatment units were installed in homes in the Lower Yakima Valley.

Yakima County compiled all of this data in a GIS database that is accessible to the public. Early estimates based on existing data, determined that approximately 12.9% of the homes exceed the drinking water standard. (Pacific Groundwater Group, 2013g).

Lower Yakima Basin, Nitrate Treatment Pilot Program Final Report, 2011



2012 EPA Study

EPA conducted an extensive sampling program monitoring over 331 residential wells in the Lower Yakima Valley in **2012**. They found 20% of the wells exceeded the drinking water standard. Additionally they monitored indicator parameters to determine sources. They identified nitrogen sources from dairies, irrigated agriculture and on-site sewage systems. This information led them to focus on contamination in the dairy cluster area which is being extensively monitored as part of an agreed order on consent (AOC) (2013).

· **Relation Between Nitrate in Water Wells and Potential Sources in the Lower Yakima Valley, 2013**