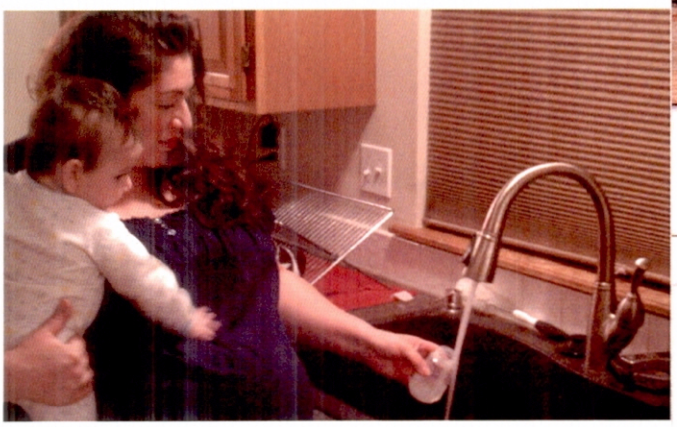
LOWER YAKIMA BASIN NITRATE TREATMENT PILOT PROGRAM

FINAL REPORT
JUNE 2011



Yakima County
Public Services

Public Services

128 North Second Street • Fourth Floor Courthouse • Yakima, Washington 98901
(509) 574-2300 • 1-800-572-7354 • FAX (509) 574-2301 • *www.co.yakima.wa.us*

VERN M. REDIFER, P.E. - Director

July 25, 2011

Ginny Stern, Contract Manager
Washington State Department of Health
P.O. Box 47822
Olympia, WA 98504-7822

Re: Lower Yakima Basin Nitrate Treatment Pilot Program Final Report
DOH Contract #N18318

Dear Ms. Stern:

I am pleased to present you with the final report for the Lower Yakima Basin Nitrate Treatment Pilot Program. This report includes:

- A full accounting of how the monies were spent;
- A description of services provided (how many households served, type of service);
- Nitrate results;
- Financial summary;
- Remaining demand; and
- Issues encountered and recommendations for next steps.

On behalf of Yakima County, I would also like to extend our appreciation to the Department of Health and other partners who helped make the Program possible: State Senator Jim Honeyford, State Departments of Agriculture and Ecology; the Yakima Health District, the U.S. Environmental Protection Agency and the Yakama Nation.

If you have any questions regarding the report or the Program, please call me at 509-574-2300. Thank you.

Sincerely,

Vern M. Redifer, P.E., Director

Attachment

cc: Senator Jim Honeyford
Tom Tebb, Director, Department of Ecology Central Region
Kirk Cook, Department of Agriculture
Gordon Kelly, Yakima Health District
Phil Rigdon, Deputy Director, Yakama Nation Natural Resources
Tom Eaton, U.S. Environmental Protection Agency

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We appreciate our program partners, who made the Nitrate Treatment Pilot Program possible:

State Senator Jim Honeyford
Washington State Department of Ecology
Yakama Nation
U.S. Environmental Protection Agency
Washington State Department of Agriculture
Washington State Department of Health
Yakima Health District
Culligan International

Yakima County Team

Vern M. Redifer, P.E., Director, Yakima County Public Services

Many thanks to our County employee team, who devoted their time, talents and energy to ensure program success:
Community Meeting Support: Sandy Bandy, Lead; Vicki Adams, José Campos, Brian Cochrane, Lisa Freund, Don Gatchalian, Robin Huard, Gordon Kelly, Nicole Means, Marisol Oviedo, Joe Stump, Mary Wurtz.
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Packet Assembly and Addressing Team: Vicki Adams, Lead; Sandy Bandy, Andrea Ely, Greta Smith, C.J. Catt, Kelly Rae, Sandy Seibert, Mary Wurtz, Robin Huard, and Jill John.
Printing Services: Robin Russell, Lead.
Spanish-Language Communications: Marisol Oviedo and Gordon Kelly.
Web Development: Kevin Wickenhagen, Lead; Jeff Legg.

Special Recognition

We also extend special appreciation to the following groups and individuals:
The County door-to-door delivery team, which delivered more than 900 nitrate packets in the program area during January and February: Doug Brown, Don Campbell, Jose Campos; Cliff Bennett, Matt Durkee, Carolyn Ehlis, Karen Hodges, Bill Trout and Jeff Legg.

In addition, many thanks to the employees of the Building and Fire Safety Division, County Roads (Construction, Development Review, Engineering, Right of Way, Road Maintenance and Traffic Divisions) and the Planning and Surface Water Divisions, who provided many staff hours to complete the packet assembly on deadline. Thanks also to our project volunteers Hilary Freund and Nick Hayter.

Washington State Department of Health

Thanks to Andres Cervantes, P.E., for project advice, Spanish-language hotline assistance and for making the Spanish-language radio interviews possible.

EPA

We also extend our appreciation to EPA staff Sandy Halstead, Rochelle Labiosa, and Caryn Sengupta for their above-and-beyond efforts in conducting lab testing, Spanish-language hotline assistance and offering coordinated project support.

Note

A lot of people worked hard to make this pilot project successful. If we have missed any individual or organization who participated, we would like to extend you our thanks.

Final Report

Nitrate Treatment Pilot Program
For
Lower Yakima Basin

I. EXECUTIVE SUMMARY

In response to ongoing concerns about nitrate contamination in Lower Yakima Valley groundwater, the 2010 Legislature provided $395,200 to allow Yakima County to develop a treatment program for households with people at high public health risk from nitrate contamination. The Nitrate Treatment Pilot Program (Program) goals were to provide public education, technical assistance and water treatment systems to households with individuals at high public health risk from nitrate contaminated wells in the lower Yakima basin.

Administered through the Washington State Department of Health (DOH), the Program was publicly launched, implemented and completed in approximately six months (January through June 2011). Program partners included the Yakima Health District, the Washington State Departments of Agriculture and Ecology, the U.S. Environmental Protection Agency (EPA), the Yakama Nation and Culligan International.

Expenditures for the project totaled $264,085 and were well within the budget of $395,200. Ninety percent of the Program budget was for the purchase and installation of up to 400 free or reduced-cost water treatment systems in affected homes.

Program Accomplishments

1. Financial Assistance. 177 free filtration systems were offered to eligible Lower Valley households.
2. Public Education, Technical Assistance and Financial Information. Over 7600 households received public education, technical assistance and financial information delivered to their home mailbox or door in their primary language (English and Spanish). In addition,
    a. Approximately 100 households received free certified lab testing.
    b. Over 250 callers received one-on-one program assistance in their primary language;
    c. Approximately 1200 Web visitors had access to information in their primary language.
    d. Over 70 people received one-on-one assistance at three public workshops.
3. 1870 households responded to the Program (21 percent response rate) by returning nitrate test results from a test strip provided in the Program mailing.
4. Definitive area-wide nitrate contamination rates were identified.
5. Program established the groundwork for comprehensive nitrate mapping.

Issues Encountered

Even at "free," the demand for a filtration system was lower than anticipated. This is attributed to a combination of factors:

- The percentage of homes with nitrates that exceed the drinking water standard of 10 ppm appears lower than originally estimated. Previous estimates indicated that 21 percent of the wells in the Program area were contaminated; however, the program's in-home testing results indicated only 9 percent were at or above the 10 ppm standard.
- A lack of interest from the public. With no local reports of nitrate-related health problems, the public's concern was not high.
- The multiple steps in the application process and the time and cost associated with obtaining certified lab results delayed participation.
- Some households were unwilling to assume the cost and/or time of system maintenance, even at Culligan's guaranteed reduced rate of $10 a month.

Next Steps

- Encourage households on private wells near community water systems (both public and private) to connect to a community water system.
- Encourage households on private wells to periodically test their water and to install treatment systems (or connect to a community water system) if nitrate levels are close to or above drinking water standards.
- If on a private well, inspect around the well to make sure surface water drains away from the well and that there is no nitrate source such as livestock.
- Maintain the required well setbacks of at least 100-foot radius around the well.
- Support and actively participate in Yakima County's Groundwater Management Area (GWMA) process.

Conclusions

- Water test results as shown on the Nitrate Map indicate that nitrate contamination, i.e., above 10 ppm, is widespread throughout Lower Yakima Basin, although it is more commonly found north of the Yakima River between Granger and Grandview and south of the river in the vicinity of Mabton.
- There are areas in Lower Yakima Basin that are at or above 5 ppm, but below 10 ppm, that require further study or analysis.
- A two-tiered public outreach strategy integrating standard practices (direct mail, media outreach, public meetings) with intensive one-on-one follow-up (door-to-door canvassing, personal calls, application assistance) is necessary to reach the diverse audience.
- EPA's inability to share groundwater test results due to its confidentiality agreement with residents prevented a more complete mapping of nitrate levels, and may have resulted in failure to provide systems to EPA-eligible households. However, EPA staff worked diligently within these constraints to help provide systems to its households and to provide water testing and application assistance to other households in the program area.

II. INTRODUCTION

Background

Yakima County Public Services, with assistance from the Yakima Health District, the Washington State Department of Ecology, and the U.S. Environmental Protection Agency (EPA) implemented a Nitrate Treatment Pilot Program (Program) to provide water treatment systems, public education, and technical assistance to households with individuals at high public health risk from nitrate contaminated wells in the lower Yakima basin. Funding for the Program was provided by a $395,200 grant from the Washington State Department of Health (DOH).

The Program was in response to a series of news articles published in the *Yakima Herald Republic* in 2008 titled "Hidden Wells Dirty Water." The articles described an on-going problem of nitrate contamination in private wells in the Lower Yakima Basin.

Following the news articles, the Environmental Protection Agency (EPA) began working with various agencies to resolve the problem, including the Yakama Nation, the State Departments of Ecology, Agriculture and Health, Yakima County and other local governments. As part of their work, EPA facilitated a number of public meetings from December 2008 through June 2010.

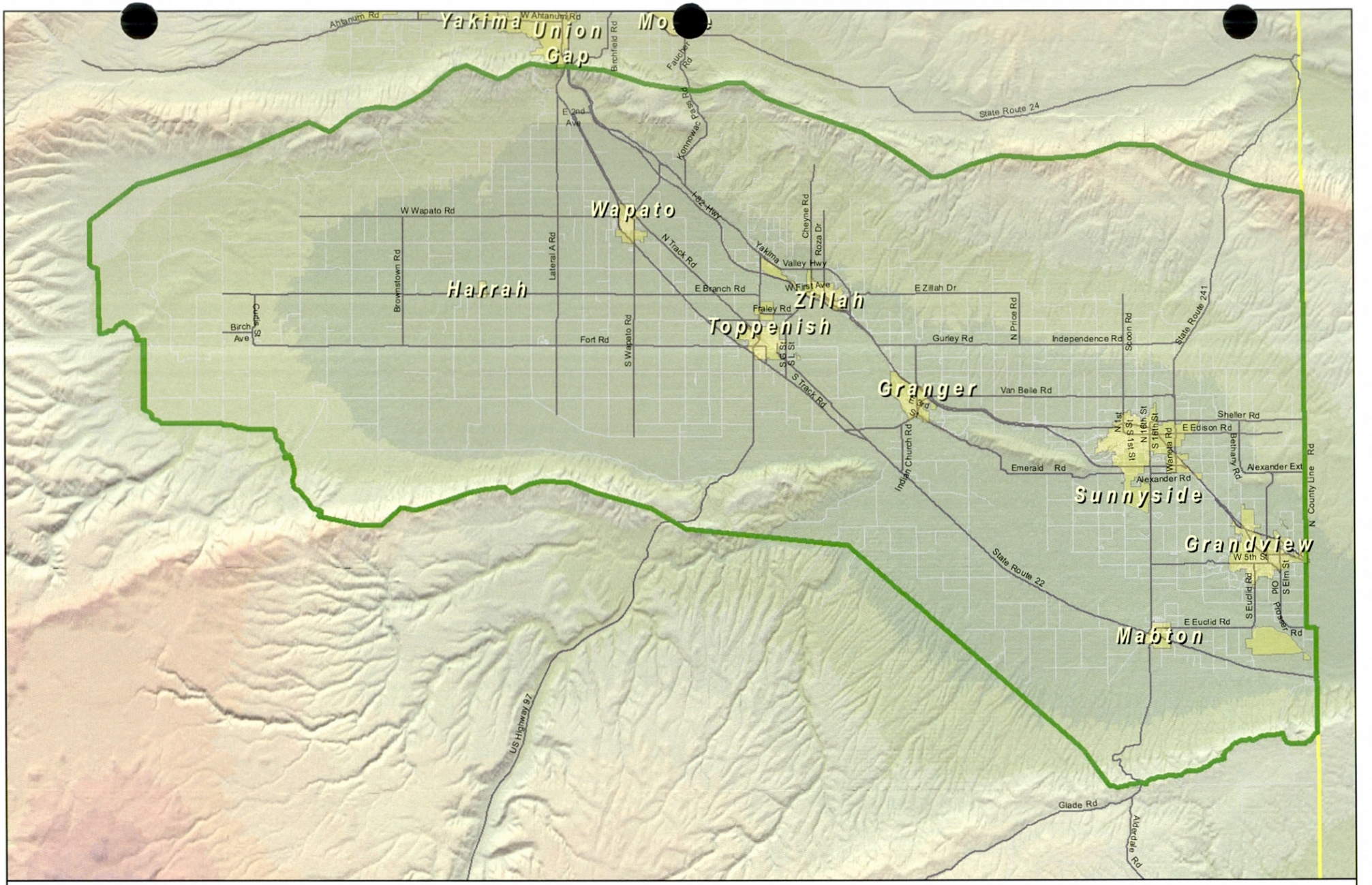
In February 2010, EPA began testing the water quality in private wells in the Lower Yakima Basin. EPA's testing showed that 21 percent of the 337 wells tested (70 wells) exceeded EPA's drinking water standard for nitrate of 10 parts per million (ppm). Some of the wells had nitrate levels above forty parts per million. A conservative estimate indicated that as many as 1,800 private wells might exceed the nitrate drinking water standard.

In April 2010, State Senator Jim Honeyford helped secure $400,000 in funding from the State's Toxic Control Account "for granting to a willing local public entity to provide emergency water supplies or water treatment for households with individuals at high public health risk from nitrate contaminated wells in the lower Yakima basin."

Yakima County agreed to be the local public entity to implement such a program, and in July 2010 signed an agreement with the Washington State Department of Health. The agreement provided funding for Yakima County to implement a Program, now referred to as the Nitrate Treatment Pilot Program, to provide in-home water treatment systems and public education related to nitrate contamination to homes supplied by private wells in the lower Yakima basin.

Program Area

The Program area is shown on Figure 1. Included in the area are approximately 800 square miles located within the Lower Yakima Basin below Union Gap, south of the Rattlesnake Hills and Ahtanum Ridge, west of the Yakima/Benton County line, and north of the Horse Heaven Hills. The Yakama Nation Closed Area was not included in the Program area since permanent residences are not allowed in the Closed Area. Although not part of the Program Area,



Major Roads
Streets
Program Area
City Limits
County Boundary

0 2 4 8 12 16 Miles

N

Figure 1
Nitrate Treatment Pilot Program Area

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households in Benton County within the Lower Yakima Basin were eligible to purchase a system at Program costs.

Program Description and Implementation Strategy

A written description of the Program (Program Narrative) was prepared early on in the project. The Program Narrative includes goals, the scope and eligibility of assistance to be provided, selection criteria for financial assistance, a communications strategy, an implementation plan, and a program timeline and budget. A copy of the Program Narrative is included in Appendix A.

It was unknown at the onset of the Program exactly how many households would meet the criteria for financial assistance for a free water treatment system. Of those that would meet the criteria, it was also unknown how many would actually apply for financial assistance. Because funding was sufficient for only about 400 systems, and it was estimated that as many as 1,600 households might be in need of a system, it was anticipated that the number of households meeting the criteria would exceed the amount of grant funds available. For that reason, the Program included selection criteria to determine which households received financial assistance and which households did not. The criteria included household income level, nitrate level, and when an application was received.

III. SERVICES PROVIDED

Public Education and Technical Assistance

Integral to carrying out the implementation strategy was the Program Communications Strategy. It was designed to meet the program's public education and technical assistance outcomes: 1) to provide water treatment systems, education and technical assistance to households with individuals at high public health risk from nitrate contamination; 2) to manage the program in a transparent manner that allowed Lower Valley residents full and fair access to the services offered under the program; and 3) to be able to report back to stakeholders in the community at large about the program successes and limitations along with recommendations for further work. A copy of the Program Communications Strategy is included in Appendix B.

Because Spanish is the primary spoken language in many households within the Lower Yakima Basin, all communication materials were prepared in both English and Spanish. In addition, interpretive services were offered for all verbal communications with the public.

The program goals required—and the program delivered—a multi-tiered, ongoing bilingual communication strategy and marketing plan that targeted and continually reached program audiences, offering ongoing opportunities for the public to ask questions and receive answers through extensive written materials, a strong media partnership, public meetings, a visual presence at local businesses and community agencies, and one-on-one program and application assistance. The outreach program was also responsive to residents' and partner agency feedback, resulting in a midcourse program correction that revised the message and identified new means to reach audiences.

The Program Packet

Central to the strategy was the program packet, a 16-page English-Spanish self-contained kit that described the program, provided health information related to nitrates and answers to frequently asked questions. It included an in-home nitrate test strip with which recipients could test their water and, in the event their water tested high in nitrate, a one-page application for financial assistance for a water treatment system. A self-addressed stamped envelope was provided for recipients to return their test strip results, certified lab results and completed applications. A copy of the packet is included in Appendix C.

The only step required of a household independent of the packet was to obtain certified lab results documenting the level of nitrates. A list of local testing labs and applicable fees was enclosed for this purpose. Instructions for contacting EPA for financial assistance for certified well testing ensured financial need would not create a barrier to participation.

7641 packets were individually prepared for mailing to households on private wells in the program area. Each packet was labeled on its mailing envelope, application and test strip with 1) parcel number, 2) resident's or owner's name and 3) address to ensure parcel-accurate results were entered into the program database.

500 unlabeled packets were delivered at the Yakama Nation's request for distribution to tribal members.

Setting the Stage

The week of December 27, 2010, EPA sent letters to its 70 households that had tested high in nitrate, announcing the program. The Yakima County Health District faxed a program letter to 350 healthcare providers in Yakima County, asking providers to talk to their at-risk patients about nitrates and to encourage program sign-up. The EPA and Health District's letters are included in Appendix D.

Yakima's Radio KIT [Townsquare Media] and Granger's Spanish-language Radio KDNA ran teasers, announcing that a County program addressing nitrate contamination was coming.

Tuesday, January 4 Program Kickoff

A kickoff news conference hosted by Yakima County and attended by Senator Jim Honeyford and the program's six federal and state partners was held at the Sunnyside Community Center. Media and program packets were distributed to the media and public; media coverage was provided by local NBC and ABC affiliates; National Public Radio; the *Grandview Herald*, *Sunnyside Daily Sun Toppenish Review*, and *Yakima Herald-Republic*.

KIT Radio hosted County, Yakima Health District and DOH staff on its January 4 morning show to discuss the program; Spanish-language Radio KDNA dedicated a one-hour public affairs call-in program that evening, attended by a bilingual DOH staff member and a county representative.

The program packets, mailed on Monday, January 3, were now arriving in Lower Valley mailboxes. The hand delivery of 900 packets began that week and continued through February.

Community Workshops

One-on-one application assistance, public education and technical assistance were offered at three evening meetings January 12 (Artz Fox Elementary School, Mabton); January 13 (Denny Blaine Building Boardroom, Sunnyside); and January 19 (Toppenish High School, Toppenish). Approximately 70 attended the meetings; Spanish-language interpretation ensured there were no barriers to communication.

Nitrate Hotline and the Program Website

English and Spanish calls began arriving on the Nitrate Hotline [1-855-740-8429]. The hotline, established to provide an easy means for individuals to ask questions and receive answers, generated over 250 calls between January and June, 2011. The top reasons for calling:

- I need another packet
- What's the status of my application?
- I need certified lab testing assistance
- I want information about the program
- I am concerned about the health impacts of nitrates

About 25 percent of the callers required a Spanish speaker call back.

The program's English-Spanish website also provided access to public education, technical assistance and program materials. As the weeks progressed, it offered regular updates on the test strip and certified lab results. The website received approximately 900 English-language and 300 Spanish-language visitors. 20 Web visitors signed up to receive the updates on the program.

Early Results

Test card results response rate was strong; application response was low. The week following the January 28 "first come first served" deadline, a total of 1,211 (16 percent) test cards were returned, but only 20 completed applications had been received. Consequently, the selection criteria of household income level, nitrate level, and when an application was received were not utilized. Ultimately, it was decided that all homes could have an individual at high public health risk from nitrate, and the criteria for a free filtration system was modified such that the only qualifying factors were a completed application and a test result showing nitrates equal to or greater than 10 ppm.

The public message was revised to encourage all households in the program area with certified lab results at or above 10 ppm to apply for a free system. EPA, meanwhile, offered its free testing services to all households in the program area, effectively removing the cost and time barrier associated with obtaining certified lab results. EPA also reviewed the applications and, upon identifying a low EPA-household response rate, began calling its confidential 2010 sampled household list to encourage program participation.

The week of February 21, as Culligan began site surveys and installations at 43 households, a plan to invite media coverage of an installation to boost interest was considered and rejected as no household was willing to participate. Instead, news releases were sent out announcing that installations were underway and provided results of the project to date. For a copy of the news releases, see Appendix E.

Follow-up and Program Feedback

Beginning in March and continuing through May 2011, County staff called and/or sent personalized follow-up letters to nearly 100 households that had submitted incomplete applications. Program feedback ranged from keen interest in receiving a system to ambivalence or disinterest and, in some cases, confusion about the program and the health impacts of nitrates. For example, some participants believed that their income levels or ethnicity would preclude them from a free system. Others were unconcerned by the health impacts of nitrates ("I've been drinking this water for 60 years and never had a problem," or "It's my landlord's problem").

Participants also expressed frustration at having to obtain and pay for certified lab results ("you already have my test card results.") Eligible households tested by EPA were confused, believing that EPA had submitted their results on their behalf. Many also expressed concern about ongoing filtration system maintenance costs.

Even at "free," the level of desire for a filtration system was low. Program feedback indicated a combination of factors: no locally-documented "proof" of adverse impacts from ingesting nitrates; no visible signs of nitrates (no taste, odor or color associated with nitrate); many residents were unwilling to take on maintenance costs; many found the application process confusing or too complex; many simply did not want to take the extra step of obtaining certified lab results.

Midcourse Corrections

In response to program feedback, the message was simplified, EPA's cost-free testing assistance emphasized, and the outreach extended through a second mailing, flyers and door-to-door outreach.

On March 25, 5,503 English/Spanish "Last Chance" postcard mailing was sent to non-responsive households in the program area, urging households to test their water and if their test strip indicated 10 ppm or above, to apply for a free system. 400 flyers and posters with the simplified message were also created and distributed by Culligan in neighborhoods where they were installing systems, inviting neighbors to test their water and apply. Culligan also distributed posters and flyers to 18 lower Valley employers and businesses. Seattle University students on a "working" spring break were also recruited to distribute flyers to Wapato-area businesses. A copy of the flyers, posters, and distribution sites are included in Appendix F.

Simultaneously over 100 "undeliverable" packets with the new, simplified message were inserted and re-mailed with updated addresses or hand delivered. County and DOH staff returned to Radio KDNA's public affairs program on March 30 to encourage listeners to test their wells and

apply. The *Yakima Herald Republic* also ran a follow-up article.

With the "Last Chance" postcard mailed, the on-air interview with Radio KDNA conducted and flyers distributed, calls to the hotline increased–especially Spanish-language calls.

EPA offered to return the Spanish-language hotline voicemails, which streamlined the application and certification process considerably. Spanish-language program participants had the same communication continuity (a means to ask questions and receive answers regarding impacts of nitrates, filtration system) as did their English-speaking counterparts. In addition, EPA and Culligan offered on-site assistance with applications as well as certified lab testing, removing another barrier to program success.

Approximately 60 packets and flyers were hand-delivered to the unincorporated community of Outlook after the County discovered that many households on private wells were not part of the original database and mailing. County staff also attended the Outlook Community Meeting on April 25 to explain the program and distribute packets.

Second program extension-May 31

By the County's April 29 deadline, 110 households had received or met eligibility criteria for installation. The County announced a program extension to Tuesday, May 31, communicating through a news release. New flyers were created and the posters updated (see Appendix G).

In June EPA and Culligan, in coordination with the County, made a final door-to-door push to help households complete their applications and to conduct well tests. As of June 30, 161 systems had been installed.

Installation of Water Treatment Systems

Request for Proposals

The first step towards hiring a contractor to install water treatment systems in homes was to prepare and issue a Request for Proposals (RFP). The RFP process was selected over a typical bid process over concerns about the long term viability and product support of a system selected solely on cost. The RFP process was allowed under RCW 70.95A.090 since the project involved installation of equipment used to abate water pollution.

Once prepared, the RFP was advertised in the *Yakima Herald Republic* on October 22 and 28, 2010. It was also provided to Contractors in the area with experience in installing Reverse Osmosis (RO) filtration systems. Contractors were given until November 8 to submit their proposal.

Yakima County received a total of seven proposals. The proposals were reviewed and ranked by staff from Yakima County and the Washington State Department of Health (DOH). Contractors submitting the top three proposals were then interviewed by Yakima County, DOH, and Yakima County Health District staff.

Selected System and Installer

Culligan International was ultimately selected for the project along with their Aqua Cleer reverse osmosis (RO) drinking water system. This system is a point of use system that provides treated drinking water at one sink in the house. Generally, the systems are installed at the kitchen sink. A point of use system was selected over a "whole house" system due to cost.

Culligan's Aqua Cleer system is NSF approved with a minimum nitrate reduction of 82.8 percent. It is rated at 36 gallons per day and includes a four port manifold to accept various filter combinations.

Systems Installed

Culligan's proposal included 4 variations of their Aqua Cleer RO system. The first (Package A) included their Aqua Cleer RO system with a 10 micron particulate pre-filter, a carbon block pre-filter, a 30-gallon per day RO membrane, a granular activated carbon post filter, a 3 gallon bladder type storage tank and a faucet. Package B included everything in Package A plus a booster pump for low pressure applications or applications with nitrates greater than approximately 20 ppm. Package C included everything in Package A plus an ultraviolet light for applications testing positive for bacteria. Package D included everything in Packages A, B and C. Manufacturer's literature on the Aqua Cleer RO system is included in Appendix H.

The cost and number of each system installed is included in the table below. Prices listed are good for two years from the date of signing of the contract between Culligan and the County, or until January 18, 2013.

Treatment System Options and Cost

	Package A	Package B	Package C	Package D
Aqua Cleer RO	$695	$695	$695	$695
Booster Pump	n/a	$195	n/a	$195
UV Light	n/a	n/a	$100	$100
Total Unit Cost	$695	$890	$795	$990
Number of Units Installed	88	35	18	20

Sixteen property owners declined a system after being approved. Two declined because they already had some form of a treatment system, while another declined so they could purchase a different system on their own. Other reasons are unknown, although maintenance costs are believed to have been a concern for some.

Post Installation Site Visits

Yakima County conducted post installation site visits with Culligan on four households to verify with the homeowner that the systems were operating as intended. Homes selected had systems installed for at least seven weeks. They also had some of the highest nitrate levels encountered during the program, including one that measured 60.8 ppm. Each of the homeowners said they were pleased with the system and none had experienced any problems. All said they had received or thought they had received owner's manuals on the systems. During the site visit, Culligan conducted field tests to verify system performance. Results of the field tests are summarized in the table below.

Post Installation Test Results

Parcel	Location 1	Location 2	Location 3	Location 4
Parcel No.	220913-11003	231026-43001	231030-21022	221024-42443
Address	4471 Sunnyside-Mabton Rd	4041 Factory Rd	1921 Sheller Rd	912 Cemetery Rd
Raw Water				
Nitrate (ppm)	40.9	17.8	60.8	28.4
TDS (ppm)	395	350	383	421
Hardness (grains/gallon)	18	0	23	0
Finished Water				
Nitrate (ppm)	4	2	4	4
TDS (ppm)	20	17	25	12

Notes:
1. Raw water nitrate level is based on certified test results provided by Culligan obtained as part of their site survey.
2. Finished water nitrate level is based on field test from post installation site visit.
3. TDS levels are based on field test from post installation site visit.
4. Raw water hardness is based on field test from Culligan's site survey.

Maintenance and Repairs

Culligan will perform system repairs for all systems installed at no cost during the first year from the date of the installation, including replacement of the membrane. Replacement of the filters is not included unless the customer purchased a maintenance program. After the first year, Culligan will adhere to the manufacturer's defect warranty and bill its labor for repairs. Parts, excluding the membrane and filters, carry a lifetime warranty.

Culligan's agreement with Yakima County includes a provision where Culligan will maintain and repair the systems under their Privilege Program at a reduced cost. Participation in the Privilege Program is optional and is paid by the household receiving the system. The cost for Package A systems is $9.95 per month. Privilege Program costs for Packages B and C is $13.95

per month and Package D is $17.95 per month. Prices include annual filter changes and replacing the RO membranes on an as needed basis. Maintenance costs are good until January 18, 2013.

Purchase Assistance

The project, as originally contemplated, included an option for those households not receiving financial assistance to purchase a system at the same cost as the County's cost to have a system installed. Because everyone who met the minimum criteria received a system at no cost, this option was not utilized. Culligan did install one system at the County's Program cost for a household that requested a system even though their nitrates were less than 10 ppm.

IV. NITRATE RESULTS

Description of Database

All data received from the test strip results, applications and certified lab results were stored in a Microsoft Office Access database. The database provides a convenient way to enter, query, track and report data received as part of this and future Programs.

The database includes:

1. Parcel number.
2. Resident's name, situs address and mailing address.
3. Owner's name, situs address, and mailing address.
4. If an application was returned, the date it was returned, nitrate level, phone number, if an at risk population is in the home, number of people in the home, age of the oldest and youngest people in the home, income, primary source of drinking water, and well depth if known.
5. If a test strip card was returned, the nitrate level and phone number.
6. Comments regarding the parcel.

Test Strip Results

Figure 2 provides a general indication of the nitrate level in over 1,800 private wells in the Program area. Levels shown on this figure are based on test strips mailed out and received back from the public as part of the mass mailing to households in the Program area. This method of testing is not as accurate as a test from a certified lab, but the data received does provide a sample of wells with nitrates both above and below 10 ppm, whereas the data received from the certified lab tests is primarily for wells already believed to be at or above 10 ppm.

Figure 2
Nitrate Test Strip Results
From Private Wells

Test Strip Results (ppm)

- < 5
- 5
- 10
- 20
- 50

N
S

Yakima County GIS

0 1.25 2.5 5 7.5 10 Miles

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Date: 6/24/2011

A tabular summary of the nitrate levels based on the nitrate test strips is included in the following table. Of the test strips returned, approximately 9 percent were over 10 ppm. This is significantly less than the 21 percent found by EPA while testing wells in the spring of 2010. If 9 percent rather than 21 percent is used to estimate the number of wells that exceed the nitrate drinking water standard, then the estimated number of nitrate contaminated wells would drop from 1,800 to approximately 700.

The percentage of test strips above 10 ppm was also less than what is estimated in the February 2010 multi-agency Lower Yakima Valley Groundwater Quality report. In this report, it was estimated that 12 percent of the domestic wells were exposed to nitrates greater than 10 ppm.

Nitrate Test Strip Results

Nitrate Level (parts per million)	Number of Test Cards Returned	Percentage
0	472	27%
1	248	14%
2	404	23%
5	447	26%
10	96	6%
20	54	3%
50	2	<1%
Subtotals	1,723	100%
Test cards at or above 10.0 ppm	152	9%
Test cards with no value indicated	147	
Total cards returned	1,870	

Notes:
1. Results are as of July 11, 2011

Certified Lab Results

Figure 3 shows certified lab results for private wells with nitrate levels over 10 ppm. The lab results were provided by the public as part of their application for financial assistance in installing a treatment system. Also included in the Figure are lab results received from EPA. Wells with lab results less than 10 ppm were not included so as to not give a false impression that most wells tested had nitrates greater than 10 ppm. In actuality, few lab results are available for wells with nitrates less than 10 ppm, because these households were not eligible for financial assistance and generally would not have submitted an application.

A tabular summary of the nitrate levels based on certified lab results is included in the following table. The highest concentrations found were over 50 ppm. One sample collected by Culligan showed a nitrate level of 70.4 ppm.

Nitrate Certified Lab Results

Nitrate Level (parts per million)	Number of Test Results Returned	Percent of Total Results Returned
0 to less than 2.50	22	8%
2.50 to less than 5.00	27	10%
5.00 to less than 10.0	42	16%
10.0 to less than 15.0	60	22%
15.0 to less than 20.0	50	18%
20.0 to less than 30.0	46	17%
30.0 to less than 40.0	13	5%
40.0 to less than 50.0	6	2%
Above 50.0	5	2%
Total Lab Tests Returned	271	100%
Lab Tests at or above 10.0 ppm	180	66%

Notes:
1. Results are as of June 28, 2011

Figure 3
Nitrate Certified Lab Results From Private Wells

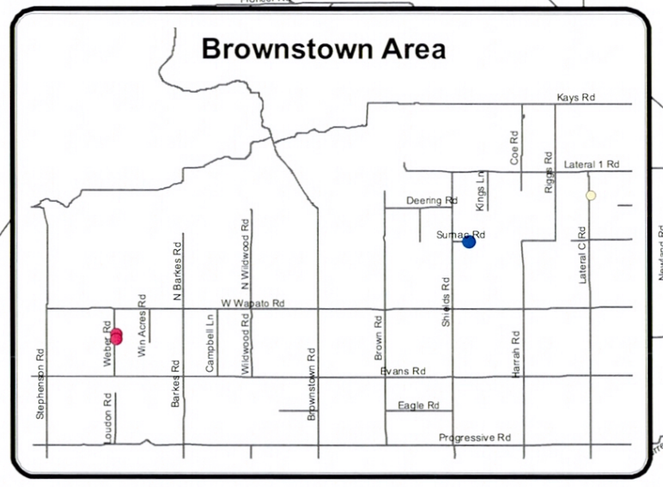
Nitrate Certified Lab Test Results (ppm)

- 10.00 - 20.00
- 20.01 - 30.00
- 30.01 - 40.00
- 40.01 - 50.00
- Greater than 50
- EPA Test Wells > 10 ppm

N

0 3,125 6,250 12,500 18,750 25,000 Feet

Brownstown Area



Path: R:\disk_5\projects\county\pw\nitrates\Jun2011\cert_lab_resultst.mxd

Date: 6/24/2011

V. FINANCIAL SUMMARY

The total grant funds available for the Program were $395,200. Total expenditures were just $264,085. A breakdown of the Program budget and expenditures is as follows:

Nitrate Treatment Pilot Program Budget and Expenditures			
Task	**Task Budget**	**Total Expenditure**	**$ Remaining**
1. Grant Administration			
Grant Accounting – Salaries & Benefits	$2,000	$642.00	$1,358.00
Grant Administration Subtotal	**$2,000**	**$642.00**	**$1,358.00**
2. Community Outreach			
Salaries and Benefits	$10,000	$74,246.07	($64,246.07)
Equipment	$500	$4,544.93	($4,044.93)
Supplies and Materials	$3,500	$7,445.26	($3,945.26)
Copying Services	$1,000	$9,085.99	($8,085.99)
Postage	$12,500	$16,312.30	($3,812.30)
Translation Services	$3,000	$1,230.00	$1,770
Meeting Room Rental	$1,500	$225.50	$1,274.50
Community Outreach Subtotal	**$32,000**	**$113,090.05**	**($81,090.05)**
3. Treatment System Contracting			
RFP Development – Salaries & Benefits	$1,500	$10,859.20	($9,359.20)
Advertising Costs	$1,000	$204.14	$795.86
Postage	$0	$23.20	($23.20)
Treatment System Contracting Subtotal	**$2,500**	**$11,086.54**	**($8,586.54)**
4. RO Purchase and Installation			
Purchase and Install ROs	$355,700	$136,407.19	$219,292.81
RO Purchase and Installation Subtotal	**$355,700**	**$136,407.19**	**$219,292.81**
5. Final Report			
Prepare Report – Salaries & Benefits	$3,000	$2,737.68	$262.32
Supplies and Materials	$0	$55.01	($55.01)
Copying Services	$0	$66.98	($66.98)
Grant Administration Subtotal	**$3,000**	**$2,859.67**	**$140.33**
Totals	**$395,200**	**$264,085.45**	**$131,114.55**

VI. REMAINING DEMAND

It is estimated that between 700 and 1,000 homes in the Program area are supplied water by wells with nitrates in excess of the drinking water standard of 10 ppm. Of these homes, 161 received nitrate treatment systems as part of this Program. It is not known how many may have already had a treatment system installed.

The low end of this range is based on an estimated 8,000 homes in the Program area supplied by private wells. It is also based on nitrates in excess of 10 ppm in 9 percent of the wells, which is what was found in the test strip results returned by residents as part of this project. The high end of this range is based on nitrates in excess of 10 ppm in 12 percent of the wells, which is what was estimated in the February 2010 multi-agency Lower Yakima Valley Groundwater Quality report.

All households that requested a treatment system, had nitrates at or above 10 ppm, and completed an application received a system. 58 homes that requested a system did not receive one because their certified lab results were below 10 ppm.

VII. ISSUES AND NEXT STEPS

Problems Encountered

- Some households were missed in the initial mailing because it was initially believed that they were served by a public water system but they are actually served by private wells.
- 900 packets required hand delivery due to incomplete address data from the County Assessor's database.
- Complexity of the program, the multiple steps in the application process, and eligibility criteria was difficult to communicate to the broad and diverse audience.
- Health effects of nitrate were difficult to convey, not visible, and not easily understood related to contamination threshold and risk factors.
- The success of the initial public outreach message made it a challenge to re-educate the public when the public message was revised in February. The initial message, anticipating large public response, emphasized program constraints (program eligibility and financial assistance criteria). This message was understood by the public; however, it was difficult to reeducate the public when the message was modified to emphasize that *all* households with nitrate levels equal to or greater than 10 ppm were eligible.
- Due to the large size of the project area and its rural character, there was little "community" presence and community leadership to draw upon for outreach.
- EPA's promise of confidentiality to its 2010 sampled households initially promoted program inefficiency, and duplication of efforts. It may have resulted in failure to provide systems to some EPA-eligible households.
- Illiteracy and low reading comprehension skills in some households required one-on-one on site assistance to verify eligibility and to complete applications.

- Some households unwilling to assume maintenance fees, even at Culligan's 2-year guaranteed reduced rate of $10 a month.
- Some households did not understand they are not required to participate in Culligan's maintenance program.

Next Steps

- Encourage households on private wells near community water systems (both public and private) to connect to the community water systems.
- Encourage households on private wells to periodically test their water and to install treatment systems (or connect to a community water system) if nitrate levels are close to or above drinking water standards.
- Encourage households on private wells to inspect around the well to make sure surface water drains away from the well and that there is no nitrate source such as livestock.
- Encourage households to maintain the required well setbacks of at least 100-foot radius around the well.
- Support and to actively participate in Yakima County's Groundwater Management Area (GWMA) process.

Conclusions

- Water test results gathered as shown on the Nitrate Map appears that nitrate contamination, i.e., above 10 ppm, is widespread throughout Lower Yakima Basin, although it is more commonly found north of the Yakima River between Granger and Grandview and south of the river in the vicinity of Mabton.
- There are areas in Lower Yakima Basin that are at or above to 5 ppm, but below 10 ppm that require further study or analysis.
- A two-tiered public outreach strategy integrating standard practices (direct mail, media outreach, public meetings) with intensive one-on-one follow-up and support (door-to-door canvassing, personal calls, application assistance) is necessary for a project of this scope.
- EPA's inability to share groundwater test results due to its confidentiality agreement with residents prevented a more complete mapping of nitrate levels, and may have resulted in failure to provide systems to EPA-eligible households. However, EPA staff worked diligently within these constraints to help provide systems to its households and to provide water testing and application assistance to many other households in the program area.

Appendix A

Program Narrative

DOH N18318

Lower Yakima Basin

Nitrate Treatment Pilot Program Narrative, Budget and Timeline

October, 2010

Program Overview: Yakima County Public Services Department (Department), with assistance from the Yakima Health District (YHD) and other willing partners, will develop and implement a Nitrate Treatment Pilot Program (Program) to provide water treatment systems, education, and technical assistance to households with individuals at high public health risk from nitrate contaminated wells in the lower Yakima basin. This Program will include education related to nitrate contamination, financial assistance in obtaining effective in-home point-of- use water treatment, and other types of technical assistance associated with the operation and maintenance of in-home treatment devices.

Approximately 75,000 persons reside within the Lower Yakima Basin area. Of that amount, about 25,000 residents (34% of the population) obtain their drinking water from private wells. Water quality testing of 453 private wells within the area conducted between 1990 and 2008 showed 55 wells (twelve percent) had nitrate levels greater than the EPA drinking water standard of 10 parts per million. Testing of 337 private wells by EPA during the spring of 2010 found that twenty-one percent of those wells (70 wells) exceeded the drinking water standard. Current testing by EPA confirms the twenty-one percent contamination rate. Accordingly, a conservative calculation using a population of 25,000 with three persons per well and a nitrate contamination rate of twenty-one percent indicates that upwards of 1,800 private wells within the area may exceed nitrate drinking water standards.

Research conducted by the Department indicates that the average cost to purchase and install a point of use treatment device capable of reducing nitrate levels below the drinking water standard is approximately $800 per well. It is unknown at the onset of this Program how many contaminated wells provide drinking water to individuals at high public health risk from nitrate. However, what is known is that there are insufficient funds to purchase and install a point of use treatment device in more than approximately 400 locations. Accordingly, the Program will include selection criteria to determine which households within the area receive financial assistance and which households do not.

English is not the primary language (written or spoken) in many households within the Lower Yakima Basin. In those households, Spanish is predominately the primary language. Accordingly, all written materials provided to households within the area will be provided in both English and Spanish. In addition, verbal communications will utilize interpretative services when necessary.

Definitions: The following definitions are used in this document:

Affected Household - A household served by a contaminated well that does not include an individual at high public health risk from nitrates.

Contaminated Well – A private well having nitrate levels in excess of the EPA drinking water standard as determined and documented by a certified testing laboratory.

Drinking Water Standard: The EPA drinking water standard for nitrate of a maximum contaminant level (mcl) of 10 parts per million.

Financial Assistance: The purchase and installation of a water treatment system in a household at Program expense.

Household: A residence located within the area that is served by a private well.

Individual at high public health risk from nitrates – A child less than twelve months of age, a woman who is pregnant, an individual with reduced stomach acidity, an individual who is deficient in the enzyme that changes methemoglobin back to normal hemoglobin, or an individual with a health condition that makes the individual susceptible to health problems from nitrates as documented by the individual's health care provider.

Installation Cost: The Department's unit cost to furnish and install a water treatment system in a household based on a service provider's or contractor's contract cost with the Department.

Low income household - A household having a yearly gross income less than 80% of the median household income for Yakima County as determined by the US Department of Housing and Urban Development income guidelines. A household's yearly gross income includes income from all residents of the household 18-years of age or older.

Maintenance Cost: The monthly cost to monitor and maintain the operability of a water treatment system in a household based on a service provider's or contractor's contract cost with the Department.

Priority Household – A household served by a contaminated well that includes an individual at high public health risk from nitrates.

Program Area or Area: The Lower Yakima Basin as defined by Exhibit A.

Purchase Assistance: The ability of a household, at the household's expense, to purchase and hove installed a water treatment system at the Department's installation cost.

Request for Proposal (RFP): The process the Department will use to select a contractor/service provider for the purchase, installation, and maintenance of water treatment systems.

Selected Priority Household – A priority household that is selected to receive financial assistance based on the selection criteria for financial assistance.

Technical Assistance: Providing information, answering questions, etc. related to Program content.

Water Treatment System – A point of use reverse osmosis filter system (RO) capable of reducing nitrates to a level below drinking water standards. Point of use means a single faucet within a household, not a whole house treatment system.

Program Goals: The primary goal of the Nitrate Treatment Program (Program) is to provide drinking water to priority households that meet drinking water standards for nitrates. Goals of the Program are to:

- Provide public education related to the health effects of nitrates on individuals.
- Provide technical assistance related to water quality testing and the interpretation of water quality test results.
- Install water treatment systems in Selected Priority Households.
- Provide purchase assistance to priority households and affected households that desire to purchase and install a water treatment system at their own expense.
- Prepare a report of the work completed under the Program including; a full accounting of how the monies were spent, a description of the services provided (how many households served, type of service), the remaining demand (include households that requested treatment/assistance but were not serviced due to a lack of funds or falling outside the selection criteria), and issues encountered and recommendations for next steps.

Scope and Eligibility of Assistance to be provided: The following types of assistance will be provided to the residents of the area:

1. Public education related to the health effects of nitrates on individuals. All households in the area are eligible for public education.
2. Technical assistance related to water quality testing and the interpretation of test results. All households in the area are eligible for technical assistance.
3. Financial assistance for the purchase and installation of a reverse osmosis treatment system. All priority households in the area are eligible for financial assistance.

4. Purchase assistance for the purchase and installation of a reverse osmosis treatment system. All priority households and affected households in the area are eligible for purchase assistance.

Selection Criteria for Financial Assistance: All priority households are eligible to apply for financial assistance. The number of priority households that do apply for financial assistance may exceed the funds available. In that event, the following criteria will be used in the order presented to prioritize and select the priority households that will receive financial assistance (selected priority household). All priority households that do not receive financial assistance will be offered purchase assistance.

1. Household income level. All other things being equal, a higher priority will be given to low income households.

2. Nitrate levels based on test results from a certified lab. All other things being equal, a higher priority will be given to those households having the highest nitrate levels. Nitrate levels will be classed into groups for prioritization (Group 1 = >40 mg/l; Group 2 = >30 mg/l to 40 mg/l; Group 3 = >20 mg/l to 30 mg/l; Group 4 = 10 mg/l to 20 mg/l;). The lower the group number, the higher the priority.

3. First come, first served. All other things being equal, a higher priority will be given to households based on the order in which requests for financial assistance are received by the Department.

Communication Strategy: A communication strategy (outreach plan) to reach at-risk targeted populations with nitrate contaminated wells is essential to the success of the Program. The Program communication strategy will be evaluated and modified based on results obtained during the course of the Program. The communication strategy is included as Attachment A.

Implementation Plan: The major implementing actions related to the goals of the Program are listed below. A more detailed listing of all implementing activities is included as Attachment B.

- Goal - Provide public education related to the health effects of nitrates on individuals.
  - ➢ Implementing Actions:
    - ✓ Work with WA DOH and YHD to develop a clear health message regarding the health effects of nitrates in drinking water. Develop factsheets, Q&As, and translated outreach materials that communicate the health message.
    - ✓ Deliver the health message consistently and repeatedly during all communications with the public – meetings, news releases, interviews, mailings, internet, etc.

- ✓ Provide health message materials to health care providers, targeted service providers, resident action groups, community leaders and the media requesting that they distribute the information.

- ✓ Provide a means for individuals to ask questions and receive answers regarding the health effects of nitrates.

- Goal - Provide technical assistance related to water quality testing and the interpretation of water quality test results.

  - ➢ Implementing Actions:

    - ✓ Develop a water quality testing message regarding nitrates in drinking water. Develop factsheets, Q&As, and translated outreach materials answering such questions as: Why do I need to have my water tested?; How do I have my water tested?; Where do I go to have my water tested?; How much does a water test cost?; and, What do my test results mean?.

    - ✓ Deliver the water quality testing message consistently and repeatedly during all communications with the public –meetings, news releases, interviews, mailings, internet, etc.

    - ✓ Provide a means for individuals to ask questions and receive answers regarding the water quality testing.

- Goal - Install water treatment systems in Selected Priority Households.

  - ➢ Implementing Actions:

    - ✓ Solicit for, and execute a contract with, a contractor or service provider to furnish, install, and maintain water treatment systems.

    - ✓ Identify priority households by using the communication strategy survey and follow up communications with households as necessary.

    - ✓ Determine selected priority households for financial assistance using the selection criteria for financial assistance.

    - ✓ Provide financial assistance to selected priority households via a financial assistance agreement.

- ✓ Notify the contractor or service provider to install the water treatment system.

- ✓ Inspect and verify the proper installation of the water treatment system.

- ✓ Pay the contractor or service provider for furnishing and installing the water treatment system.

- Goal - Provide purchase assistance to priority households and affected households that desire to purchase and install a water treatment system at their own expense.

  - ➢ Implementing Actions:

    - ✓ Identify priority households and affected households that desire to purchase and have installed a water treatment system at their own expense by using the communication strategy survey and follow up communications with households as necessary.

    - ✓ Provide the contractor or service provider contact information for households requesting purchase assistance.

- Goal - Prepare a report of the work completed under the Program including; a full accounting of how the monies were spent, a description of the services provided (how many households served, type of service), the remaining demand (include households that requested treatment/assistance but were not serviced due to a lack of funds or falling outside the selection criteria), and issues encountered and recommendations for next steps.

    - ✓ Develop and use a Geographic Information System application and a Program database that assists in public outreach and that documents all data collected within the area.

    - ✓ Develop and use a job costing system that tracks all Program expenditures.

    - ✓ Monitor and document all Program activities.

    - ✓ Prepare and deliver a report of the work completed under the Program including issues encountered, solutions, and recommendations for next step.

Program Timeline: All Program work will be completed no later than June 30, 2011. The timelines for major milestones are shown below with projected start and completion dates. A complete timeline of all activities is included as Attachment B.

Activity	Start	Complete
Execute Grant Agreement	7/1/2010	7/15/2010
Create GIS Application	8/1/2010	9/6/2010
Prepare RFP	8/20/2010	10/15/2010
Advertise RFP	10/19/2010	11/8/2010
Evaluate RFP Proposals	11/9/2010	11/15/2010
Negotiate & Execute RFP Contract	11/16/10	11/29/10
Develop Communication Strategy	7/30/2010	10/5/2010
Create Communication Materials	10/6/2010	11/23/2010
Mail Info Packet & Survey	11/30/2010	11/30/2010
Public Meetings	12/6/2010	12/10/2010
Survey Response Time Allowance	12/2/2010	12/29/2010
Evaluate Survey Responses	12/30/2010	1/5/2011
Apply Financial Assistance Criteria	1/5/2011	1/5/2011
Offer Financial Assistance to "Selected Priority Households"	1/10/2011	4/1/2011
Install RO's in Selected Priority Households	1/24/2011	4/29/2011
Offer Purchase Assistance to Priority & Affected Households	1/10/2011	4/1/2011
Prepare & Submit Final Report	5/1/2011	6/15/2011

Program Budget: The Program budget is as follows:

Nitrate Treatment Pilot Program Budget

Task	Sub Task Amount	Task Total
1. Grant Administration		
1.1 Grant Accounting - Salaries and Benefits	$ 2,000.00	
Grant Administration Subtotal	$ 2,000.00	$ 2,000.00
2. Community Outreach		
2.1 Salaries and Benefits	$ 10,000.00	
2.2 Equipment	$ 500.00	
2.3 Supplies and Materials	$ 3,500.00	
2.3 Copying Services	$ 1,000.00	
2.4 Postage	$ 12,500.00	
2.5 Translation Services	$ 3,000.00	
2.6 Meeting Room Rental	$ 1,500.00	
Community Outreach Subtotal	$ 32,000.00	$ 32,000.00
3. Treatment System Contracting		
3.1 RFP Development - Salaries and Benefits	$ 1,500.00	
3.2 Advertising Costs	$ 1,000.00	
Treatment System Contracting Subtotal	$ 2,500.00	$ 2,500.00
4. RO Purchase and Installation		
4.1 Purchase and Install ROs	$ 355,700.00	
RO Purchase and Installation Subtotal	$ 355,700.00	$ 355,700.00
5. Final Report		
5.1 Prepare Report - Wages and Benefits	$ 3,000.00	
Final Report Subtotal	$ 3,000.00	$ 3,000.00
Total Program Budget		**$ 395,200.00**

Appendix B

Communication Strategy

DRAFT 1.1 Yakima Nitrate Treatment Program Communication Strategy 10/2010

1. Audience

The primary audience for the Nitrate Treatment Program is the residents in the "lower" Yakima Valley that rely on private wells for their drinking water supply. Many private wells in the lower valley are contaminated with nitrate. The 2010 legislature provided funding to Yakima County to provide emergency treatment options for households with individuals at high public health risk from nitrate contaminated wells. This communication strategy is designed to help those residents in the area understand the County's Nitrate Treatment Program, its services and how they can access educational, technical, and financial assistance programs if they have a contaminated well.

The secondary audiences include:

- Lower valley residents who are interested in ongoing discussions and developments regarding groundwater contamination in the lower valley,
- local government and decision makers,
- the local communities,
- community based interest groups,
- the Yakama Nation,
- Agricultural stakeholders,
- Environmental stakeholders,
- EPA and State agencies working on groundwater issues in the Valley, and
- The media.

2. Major Concerns:

- Nitrate contamination in private drinking water wells makes drinking water unsafe for individuals at high public health risk from nitrates.

- Assuring the public has clear information on the health risk of nitrates and understands "who is at risk?", "who is not at risk?", "is my well safe?", and "what can be done to make me and my family safe?"

- Providing clear information on the selection criteria used to determine eligibility for the financial assistance program.

- Providing residents full access and opportunity to participate in the County's nitrate treatment program -- especially the financial assistance program for priority households.

- Reverse Osmosis Nitrate treatment in and of itself will not address bacterial contamination. Some households may require pretreatment to remove bacterial contamination. Without pretreatment the systems will not be effective.

- **Reverse Osmosis treatment systems will require on-going operation and maintenance costs not covered by this program. Without ong**oing maintenance the systems will not be effective in the long term. Clear information on the health risk and selection criteria used to determine eligibility in the financial assistance program.
- Clear information on treatment options, limitations, and costs must be available in both English and Spanish.

3. Current Issues *(Issues that have recently arisen, or could arise, that could materially affect this audience's relationship with the project.)*

Funding is limited and may not allow all "At- risk" homes to participate in the priority household program. (This is a one- time program with no additional funding identified at this time.)

There is a time limit on the program and funds. There will likely be households that want to take advantage of the program after the time has expired and the funds have been spent.

Homeowner permission/approval is required to participate in the priority household program. Not all affected households own the homes they are living in.

Not all residents will be comfortable entering into an agreement with the county or providing personal or financial information to the program.

English is not the primary language for a significant population in the area.

The County is pursuing a local ground water management program in cooperation with the Department of Ecology. There may be perceived overlap or confusion between the two programs.

There is a degree of distrust between some potentially impacted residents and the County and state agencies involved in this and the groundwater management initiative.

4. Goals

- Provide water treatment systems, education, and technical assistance to households with individuals at high public health risk from nitrate contamination.
- Manage the program in a transparent manner that allows lower valley residents full and fair access to the services offered under the program.
- To be able to report back to stakeholders and the community at large about the program successes and limitations along with recommendations for further work. (report to legislature and GIS application)

5. Key Messages *(No more than three overriding messages – what are the three most essential things for this audience to understand/believe?)*

1) The County is actively engaged in providing assistance to valley residents who have contaminated wells. (This effort reflects cooperative efforts between the County Public Services Department and the Local Health District and is supported by the County Commissioners).

2) Technical assistance (both educational and financial) is open to all impacted households. Access to financial assistance will be transparent, and based on public health risk and financial need criteria laid out in advance.

3) This is just one part of a larger program being developed to address groundwater issues in the lower valley.

6. Proposed Communication Approach *(Specific ways in which we will work with this audience in the future)*

General approach:

Bilingual educational materials:
Given the target populations and the demographics of the lower valley most materials will need to be available in both English and Spanish. Translation services will likely be needed for public meetings.

Outreach coordinated with Yakima Environmental Health Programs
Department and Health District personnel will be available to answer an individual's questions by telephone, email, mail, and in person. Establish web application and telephone hotline to assist with managing information requests.

Work with WA DOH to present health messages and public health expertise
Develop project specific factsheets, Q&As, and translated outreach materials on nitrates i n drinking water, testing, health risk, point of use treatment, and treatment alternatives for contaminated drinking water.

Public meetings in the affected communities to explain the program, encourage, participation and share related treatment and health information While not the primary means of reaching the target audience, public meetings will be used to follow-up with affected and priority households where specific Program information will be provided.

Media releases
The Department will provide news releases at key Program milestones to all media servicing the area. Department and Health District personnel will be available for media interviews. Encourage local media coverage of al phases of the project.

Specific outreach elements

Health Care Provider Notification:
The Yakima Health District will contact all health care providers requesting that they distribute Program information provided to them to patients that are at high health risk from nitrates.

WIC program outreach:
Provide program information to WIC service providers and related service providers to improve access to pregnant and nursing women and women with infants under 12 months.

Targeted Mailings:

- Initially, a program packet will be mailed to all residential households within the area that are not served by a public water system. The packet will include items such as:
    - Information about the Program,
    - Information about the health effects of nitrates,
    - Who to call or where to go to have questions answered,
    - Where to go or who to contact about having their water tested,
    - A nitrate test strip with instructions on how to use it.
    - A return envelop and survey will be included that collects household demographics and provides the household a means to request additional information.
- Follow-up mailings: Depending upon the success of the initial mailing, additional mailings may be used to provide and / or collect information.

Internet
The County Public Services department will develop and maintain web based materials on the program. It will serve as a central web source for information related to the treatment outreach program.

Community leader and local citizen group out reach:

- Word of Mouth: All Program communications will encourage households to "spread the word" about the Program to their friends, relatives, and neighbors who reside in the area.
- Communication with community leaders, church groups, and resident action groups that work with the "at risk" or "hard to reach" subpopulations in the lower valley.

Outreach to the Yakama Nation:
To insure that opportunities to partner with the tribe are available and discussed with Tribal representatives and to coordinate health messages as appropriate.

7. Communication Products Needed *(List of communication products or tools that will need to be developed – i.e., draft report, letter to legislators, news release, PowerPoint presentation, posters, etc.)*

Initial mailing packet to lower valley residents

- Initial program flyer
- Q&A about the program and options
- Nitrate Test strips and instructions
- Fact sheet on screening criteria and how they will be used
- Survey and demographic questionnaire

Medical provider Factsheet and letter

Fact sheet on nitrate treatment options

Fact sheet on RO –treatment considerations, (limitations, costs, operation and maintenance)

Water sampling fact sheet

Homeowner participation agreement Q& A

Media packages and interview options for both English and Spanish media
Must have access to both English and Spanish speaking health authorities

GIS application to log data points and user information

Appendix C

Program Packet

Yakima County Public Services

NITR

PARCEL NO. 21112632001
BARTOLO CASTILLO
Or Current Resident
5281 E ZILLAH DRIVE
GRANGER, WA 989329770

¿Qué tan bueno es su pozo?

Esta tira de prueba es una valoración rápida de probar el nivel de Nitrato en su agua potable.

Por favor mantenga limpia y seca la tira de prueba hasta que esté listo para usarla. El agua y la humedad harán que los resultados de su prueba son erróneos.

Para hacer la prueba:

1. Deje correr el agua aproximadamente 5 minutos por una de las llaves que sea su fuente principal de agua para beber y que no esté conectada a un sistema de tratamiento .

2. Después de dejar correr el agua por 5 minutos, pase la tira de la prueba por lo menos 2 segundos por debajo de la corriente suave de agua. **No sacuda el exceso de agua de la tira.**

3. Por 60 segundos sostenga derecha la tira, con los cuadernos/ cuadros arriba.

4. Cuando han pasado 60 segundos, compare el cuaderno al final de la [redacted] con la tabla de colores de abajo. El color se oscurecerá con el tiempo, es importante tomar la lectura cuando han transcurrido 60 segundos. **Encierre en un círculo o marque los resultados abajo.**

5. Si el color está cerca de 10 ppm o más alto, por favor considere tomar una prueba de su agua a un laboratorio certificado, de la lista que le proveemos. Puede ser que a este nivel hay asociados efectos de la salud con bebiendo el agua.

Nitrógeno de nitrato ppm

0 1 2 5 10 20 50

Nombre:_____

Dirección de correo:_____

de teléfono durante el día:_____

Parcela # _____

La calidad de su agua es importante para nosotros.
Por favor regrese esta tarjeta en el sobre con el envío pre pagado.
Gracias

Visítenos en www.yakimacounty.us/nitrateprogram
Línea directa de nitrato al 855-740-8429

Yakima County Public Services

NITRATE TREATMENT PILOT PROGRAM

Please Tell Us:
HOW WELL IS YOUR WELL?

This test strip will provide a quick assessment of Nitrate levels in your drinking water.

Please keep the strip clean and dry until you are ready to use it. Water and humidity will make your test results inaccurate.

To do the test:

1. Let the water run from a water tap, that is your primary source of drinking water, and that is not connected to a treatment system for approximately 5 minutes.

2. After running the tap for 5 minutes, pass the strip under the gentle stream of water for at least two seconds. **Do not shake excess water off the strip.**

3. Hold the strip level, with pad/squares side up for 60 seconds.

4. At 60 seconds, compare the pad near the end of the strip to the color chart below. The color will darken over time [redacted] is important to take the reading at 60 seconds. **Circle or [redacted]rk the results below.**

5. If the color is near 10 ppm or higher, please consider having your water tested by a certified lab from the list provided to you. There may be health effects associated with drinking water at this level.

Nitrate nitrogen ppm

Name: _____

Physical Address: _____

Daytime Phone #: _____

Parcel # _____

Your Water Quality Is Important To Us
Please return this card
In the enclosed postage-paid envelope.
Thank you.

Visit us at www.yakimacounty.us/nitrateprogram
Nitrate Hotline at 855-740-8429

akima County Public Services
NITRATE TREATMENT PILOT PROGRAM
128 N 2nd St, 4th Fl., Yakima WA 98901

Nitrate Treatment Pilot Program
Yakima County Public Services
Yakima County Courthouse 4th Floor
128 N. 2nd St.
Yakima, WA 98901

Have you enclosed your
Completed nitrate test card?

Are you also submitting an application?
Remember to enclose your certified well test results!

¿Ha incluido su tarjeta de prueba de nitrato completa?
¿También está enviado una solicitud?
Recuerde incluir los resultados certificados de la prueba de su pozo.

Form # UTL0003 A
Revised 12/08/2010

APPLICATION FOR NITRATE TREATMENT SYSTEM

Yakima County Public Services · 128 North Second Street · Fourth Floor Courthouse · Yakima, Washington 98901
1-855-740-8429 · FAX (509) 574-2301 · www.yakimacounty.us/nitrateprogram

PARCEL NO. 21112632001
BARTOLO CASTILLO
Or Current Resident
5281 E ZILLAH DRIVE
GRANGER, WA 989329770

Applicant Information
Name_____
Mailing Address_____
Installation Address_____
Parcel Number_____
Phone _____

Owner Information (if different from above)
Name_____
Mailing Address_____
Phone_____

Nitrate Level Based on Certified Lab Results (please attach results) _____ milligrams per liter (mg/l).

At Risk Population in Home: □ **Yes** □ **No**
At risk population includes children less than 12 months of age, pregnant women, or individuals susceptible to health problems from nitrate.

Number of People Living in Household: _____ people.

Age of Youngest Person in Household: _____ years (if less than 1 year _____ months).

Age of Oldest Person in Household: _____ years.

Household Income: $_____.
Household income is the total annual income of all persons in the household 18 years of age or older.

What is your primary source of drinking water?

- □ Individual well
- □ Shared well with a neighbor
- □ Bottled water
- □ City water
- □ Other (describe)

Depth of Well (if known): _____feet.

I declare under penalty of perjury that the information given by me in this application is true, correct and complete to the best of my knowledge and realize that willful falsification of this information by me may subject me to penalties as provided in Washington State Laws. Yakima County does not warranty any nitrate treatment system or the installation of any treatment system. Yakima County is not responsible for any damage that may occur to an applicant's property as a result of installing the treatment system under this program. The undersigned agrees to hold harmless Yakima County, its commissioners and employees, from and against all loss, damage, expense and liability resulting from or otherwise relating to the installation and use of the treatment system.

_____ _____
Applicant's Signature Date

_____ _____
Owner's Signature (if different from Applicant) Date

Please remember that applications received by January 29, 2011 will be given first priority.

Office Use Only:
Application No. _____
Nitrate level before treatment (ppm) _____
Nitrate level after treatment (ppm) _____

Español al reverso

Form # UTL0003 A
Revised 12/08/2010

SOLICITUD PARA SISTEMA DE TRATAMIENTO DE NITRATO

Yakima County Public Services · 128 North Second Street ·
Fourth Floor Courthouse · Yakima, Washington 98901
1-855-740-8429 · FAX (509) 574-2301 · www.yakimacounty.us/nitrateprogram

Información del solicitante

Nombre_____
Dirección de correo_____
Dirección de la instalación_____
Número de parcela (vea el número de 11 dígitos en el sobre arriba de la dirección)_____
Teléfono _____

Información del propietario (si es diferente a la persona de arriba)

Nombre_____
Dirección de correo_____
Teléfono_____

Nivel del nitrato según los resultados del laboratorio certificado (Por Favor sujete los resultados) _____ miligramos por litro (mg/l).

Población en riesgo en la casa: ☐ **Si** ☐ **No**
La población en riesgo en la casa incluye niños menores de 12 meses de edad, mujeres embarazadas o personas susceptibles a problemas de salud por nitratos.

Número de personas que viven en la casa: _____ personas.

Edad de la persona de menor edad en la casa: _____ años (si es menor de 1 año _____ meses).

Edad de la persona de más edad en la casa: _____ años.

Ingreso de la casa: $_____.
El ingreso de la casa es el ingreso anual total de todas las personas que viven en la casa mayor de 18 años.

¿Cuál es su fuente principal de agua potable?

- ☐ Pozo individual
- ☐ Pozo compartido con un vecino
- ☐ Agua embotellada
- ☐ Agua de la ciudad
- ☐ Otro (describa)

Profundidad del pozo (si lo sabe): _____pies.

Declaro bajo pena de perjurio que la información que doy en esta solicitud es verdadera, correcta y completa a lo mejor de mi conocimiento y sé que la falsificación intencional de mi parte de esta información me puede hacer sujeto a las penalidades que estipulan las Leyes del Estado de Washington. El Condado de Yakima no garantiza ningún sistema de tratamiento de nitrato ni la instalación de ningún sistema de tratamiento. El Condado de Yakima no se hace responsable de ningún daño que pueda ocurrir a la propiedad de un solicitante como resultado de la instalación del sistema de tratamiento bajo este programa. La persona que firma está de acuerdo eximir de responsabilidad al Condado de Yakima, a sus comisionados y empleados, de y en contra de toda la pérdida, daño, gasto y responsabilidad que resulte de o de alguna manera relacionada con la instalación y uso del sistema de tratamiento.

_____ _____
Firma del solicitante Fecha

_____ _____
Firma del propietario (si es diferente a la persona de arriba) Fecha

Por favor recuerde que se les dará prioridad a las solicitudes que se reciban para el 29 de enero, 2011.

Office Use Only:
Application No. _____
Nitrate level before treatment (ppm) _____
Nitrate level after treatment (ppm) _____

See Reverse Side For English

Public Services

128 North Second Street • Fourth Floor Courthouse • Yakima, Washington 98901
Nitrate Treatment Program Hotline: 855-740-8429 • *www.yakimacounty.us/nitrateprogram*

VERN M. REDIFER, P.E. - Director

January 4, 2011

RE: Nitrate Treatment System for Your Drinking Water

Dear Yakima County Resident:

Yakima County is beginning a limited state funded program to install water treatment systems in homes served by private wells with a high level of nitrate. Because your home is located in the Lower Yakima Basin, you may be eligible to have a treatment system installed free or at a reduced cost.

Elevated levels of nitrate in groundwater are common in many parts of the United States. Nitrate is only a concern for ingestion (eating and drinking). If you have immediate concerns about the nitrate level in your drinking water, the quickest thing to do is to begin using bottled water for drinking. Boiling your water will not remove the nitrate.

The water treatment systems being installed consist of a small point-of-use filtering system, which in most cases fits under a kitchen sink. Treated water is available from a single faucet installed on the sink and can be used for cooking and drinking water. The system will require periodic maintenance to be effective.

To be eligible for financial assistance and have a system installed at no cost, your water must have a nitrate level greater than the Environmental Protection Agency's (EPA) drinking water standard of 10 milligrams per liter (mg/l), and your home must have an individual at high public health risk from nitrate. Individuals at high public health risk may include:

1. Infants less than 12 months of age.
2. Women who are pregnant.
3. Individuals with a health condition, such as reduced stomach acidity or deficiencies in the enzyme that changes methemoglobin back to normal hemoglobin, that makes them susceptible to health problems from nitrate.

To help provide you with a general idea of the nitrate level in your water, we have enclosed a nitrate test strip. Instructions on its use are included with the test strip. If the test strip indicates the nitrate level in your water is close to or greater than 10 mg/l, then you should take a sample of your water to a certified laboratory for testing.

Test results from a certified laboratory, documenting the nitrate level in your water, are required to participate in the program. A list of certified laboratories and their approximate cost to test for nitrate is enclosed. The laboratory cost is not reimbursable. You may pick up a nitrate sampling container and sampling instructions at any one of these laboratories. If you have previous sample results from a certified laboratory, these will be accepted.

If EPA has already collected a water sample from your home and has provided you with a letter indicating the nitrate level of your well, then another water test is not necessary. In addition, EPA has a sampling program to assist families who cannot afford to pay for laboratory analysis and who meet the high public health risk criteria above. Contact Sandy Halstead of EPA at halstead.sandra@epa.gov or 509-786-9225 for sampling assistance, or if you require a copy of your drinking water test results.

You are still eligible to have one of the treatment systems installed at a reduced cost, even though your home does not have an individual at high public health risk from nitrate, provided your nitrate level is greater than 10 mg/l. The estimated treatment system cost is between $695 and $990 depending on the type of system you need.

If you are interested in participating in the program, please enclose the following three items in the self-addressed stamped envelope provided and drop it in the mail.

1. A nitrate test result from a certified laboratory showing the nitrate level is greater than 10 mg/l, or a copy of the letter from the EPA stating they had taken the nitrate test and the nitrate level is greater than 10 mg/l.
2. A completed copy of the enclosed *Application for Nitrate Treatment System*.
3. Your nitrate test card with the test results circled.

If you need assistance completing your application, please attend a **Nitrate Public Meeting** on either **January 12 in Mabton at the Artz-Fox Elementary School, 805 Washington St.; or January 13 in Sunnyside at the SEMY/MSDR Bldg, 810 E. Custer Ave.; or January 19 in Toppenish at the Toppenish High School, 141 Ward Rd. All meetings begin at 6:00 PM.**

Only about 400 systems are available at no cost, with the remainder available at a reduced cost, so it is important that you submit your application soon. Applications received by January 28, 2011 will be given first priority. Applications will be accepted until April 29, 2011. We will notify you within approximately three weeks of receiving your application if you were selected for financial assistance.

In the event our funding is not enough to cover the cost for all homes qualifying for a system, additional criteria will be used to determine which households receive financial assistance and which households do not. Criteria may include income level, nitrate level, and date the application was submitted.

Information on the health effects from high nitrate is enclosed. We encourage you to take a few minutes to read the information and use the enclosed test strip to check the nitrate levels in your water.

Even if you choose not to apply, please complete the nitrate test card and drop it in the mail. No postage is required. Your results will help us to understand nitrate levels in our valley. Your participation in this important project is appreciated.

For more information, please call Yakima County's Nitrate Hotline at 1-855-740-8429 or visit our website at www.yakimacounty.us/nitrateprogram.

Public Services

128 North Second Street • Fourth Floor Courthouse • Yakima, Washington 98901
Nitrate Treatment Program Hotline: 855-740-8429 • *www.yakimacounty.us/nitrateprogram*

VERN M. REDIFER, P.E. - Director

4 de enero, 2011

REF: Sistema de Tratamiento de Nitrato para su agua potable

Estimado residente del Condado de Yakima:

El Condado de Yakima va iniciar un programa limitado financiado por el estado para instalar sistemas de tratamiento de agua en las casas que usan pozos privados con un alto nivel de nitrato. Debido a que su casa está localizada en la Cuenca Baja del Valle de Yakima, usted puede ser elegible para que se le instale un sistema de tratamiento de agua gratis o a bajo costo.

En muchas partes de los Estados Unidos es común que se haya un elevado nivel de nitrato en el agua subterránea. El nitrato es sólo una preocupación si se ingiere (comido y bebido). Si usted tiene preocupaciones inmediatas sobre el nivel de nitrato en su agua para beber, lo primero que debe hacer es comenzar a usar agua embotellada para beber. Hervir el agua no eliminará el nitrato.

Los sistemas de tratamiento de agua que se van a instalar son un pequeño sistema de filtración de punto de uso, que en la mayoría de los casos se instala debajo del fregador de la cocina. El agua tratada está disponible sólo en la llave instalada en el fregador y se puede usar para cocinar y para beber. Para ser efectivo el sistema requerirá mantenimiento periódico.

Para ser elegible para recibir ayuda financiera y tener un sistema instalado sin costo, su agua debe tener un nivel de nitrato más alto que el estándar establecido por la Agencia de Protección de Ambiente (EPA) para agua potable de 10 miligramos por litro (mg/l) y la casa debe tener por lo menos una persona con alto riesgo de salud por nitrato. Las personas de alto riesgo de salud pueden incluir:

1. Niños menores de 12 meses.
2. Mujeres embarazadas.
3. Personas con problemas de salud, como acidez estomacal reducida o deficiencias en las encimas que cambian la metahemoglobina a hemoglobina normal, lo que los hace susceptibles a problemas de salud por nitrato.

Para proveerle una idea general de los niveles de nitrato en su agua, hemos incluido una tira de prueba de nitrato. En la tira de prueba están incluidas las instrucciones para su uso. Si la tira de prueba indica que el nivel de nitrato en su agua está cerca o es mayor a 10 mg/l, entonces debe llevar una muestra de su agua a un laboratorio certificado para que se le hagan las pruebas.

Para participar en el programa se requieren los resultados de la prueba de un laboratorio certificado documentando el nivel de nitrato en su agua. Se incluye una lista de laboratorios certificados y el costo aproximado para hacer la prueba de nitrato. El costo del laboratorio no es reembolsable. Usted debe recoger en alguno de estos laboratorios un recipiente para la muestra de nitrato y las instrucciones. Si usted tiene los resultados de muestras previas de un laboratorio certificado, éstos serán aceptados.

Si EPA ya ha recolectado una muestra de agua de su casa y le ha enviado una carta indicando el nivel de nitrato en su pozo, entonces no es necesario tomar otra prueba de su agua. Además, EPA tiene un programa de pruebas para ayudar a las familias que no pueden pagar por el análisis del laboratorio y que cumplen con el criterio de alto riesgo de enfermedad pública establecido arriba. Para recibir

asistencia con la muestra o si necesita una copia de los resultados de la prueba de su agua para beber, comuníquese con Sandy Halstead de EPA en halstead.sandra@epa.gov ó 509-786-9225.

Usted continúa siendo elegible para que se le instale un sistema de tratamiento de agua a bajo costo, aun si su casa no tiene una persona en alto riesgo de enfermedad pública por nitrato, siempre y cuando su nivel de nitrato sea mayor de 10 mg/l. El costo estimado del sistema de tratamiento de agua es entre $695 y $990 dependiendo del tipo de sistema que usted necesite.

Si le interesa participar en el programa, por favor adjunte los siguientes tres documentos en el sobre que incluimos con porte pagado y envíelo por correo.

1. El resultado de la prueba de nitrato de un laboratorio certificado mostrando que el nivel de nitrato es mayor a 10 mg/l, o una copia de la carta de EPA estableciendo que ellos han hecho la prueba de nitrato y que el nivel de nitrato es mayor que 10 mg/l.
2. Una copia completa de la *Solicitud del Sistema de Tratamiento de Nitrato* adjunta.
3. Su tarjeta de prueba de nitrato con los resultados de la prueba encerrados en un círculo.

Si usted necesita ayuda para llenar su solicitud, por favor asista a una de las **Juntas Públicas de Nitrato** que se realizarán el 12 de enero en Mabton en la escuela primaria Artz-Fox, **805 Washington St.;** o el 13 de enero en Sunnyside **en el edificio SEMY/MSDR Bldg, 810 E. Custer Ave.; o el 19 de enero en Toppenish en Toppenish High School, 141 Ward Rd. Todas las juntas iniciarán a las 6:00 PM.**

Sólo hay disponibles aproximadamente 400 sistemas sin costo alguno, con el resto disponible a bajo costo, por lo que es importante que envíe pronto su solicitud. Se les dará prioridad a las solicitudes que se reciba a más tardar el 28 de enero, 2011. Se aceptarán solicitudes hasta el 29 de abril, 2011. En aproximadamente tres semanas después de recibir su solicitud, nosotros le notificaremos si fue seleccionado para recibir ayuda financiera.

En caso de que nuestros fondos no sean suficientes para cubrir el costo de todas las casas que califiquen para recibir un sistema, se usará un criterio adicional para determinar cuales casas recibirán la ayuda financiera y cuales casas no la recibirán. El criterio puede incluir el nivel de ingreso, el nivel de nitrato y la fecha en que se envió la solicitud.

Se incluye información sobre los efectos que tiene un alto nivel de nitrato en la salud. Lo animamos a que tome unos minutos para leer la información y que use la tira de prueba que incluimos para revisar los niveles de nitrato en su agua.

Aun, si usted decide no participar, por favor complete la tarjeta de prueba de nitrato y envíela por el correo. No necesita pagar por el envío. Sus resultados nos ayudarán a entender los niveles de nitrato en nuestro valle. Apreciamos mucho su participación en este proyecto tan importante.

Para más información, por favor llame a la línea directa de nitrato del Condado de Yakima al 1-855-740-8429 o visite nuestro sitio en www.yakimacounty.us/nitrateprogram.

Nitrate Treatment Pilot Program
Certified Testing Laboratories

Laboratory Name	Address	Phone	Web Site	Approximate Cost
Ag Health Laboratories, Inc.	445 Barnard Boulevard Sunnyside, WA	(509) 836-2020	www.aghealthlabs.com	Nitrate - $30 Coliform - $21
Benton-Franklin Health District Lab	7102 West Okanogan Place Kennewick, WA	(509) 460-4206	www.bfhd.wa.gov	Nitrate - $24 Coliform - $24
Cascade Analytical Inc. - Yakima	1008 West Ahtanum Road, #2 Yakima, WA	(509) 452-7707	www.cascadeanalytical.com	Nitrate - $45 Coliform - $25
Mukang Labs, Inc.	2526 E. Saint Helens Street Pasco, WA	(509) 544-2159	www.mukanglabs.com	Nitrate - $19 Coliform - $19
Northwest Agricultural Consultants, Inc.	2545 West Falls Ave. Kennewick, WA	(509) 783-7450	www.nwag.com	Nitrate - $15 Coliform - NA
Valley Environmental Laboratory	201 East D Street Yakima, WA	(509) 575-3999	http://www.valleylab.net/	Nitrate - $30 Coliform - $20

All of the above laboratories are certified by the Washington State Department of Ecology to test for nitrate in drinking water. Ag Health Laboratories, Benton-Franklin Health District, Cascade Analytical, Mukang Labs and Valley Environmental Laboratory are also certified to test for coliform in drinking water.

Costs shown for nitrate and coliform tests are approximate and subject to change.

Testing for nitrate is required to participate in this program. A coliform test is recommended but not required.

Programa Piloto de Tratamiento de Nitratos
Laboratorios Certificados

Nombre del laboratorio	Dirección	Teléfono	Web Site	Costo aprox.
Ag Health Laboratories, Inc.	445 Barnard Boulevard Sunnyside, WA	(509) 836-2020	www.aghealthlabs.com	Nitratos - $30 Coliforme - $21
Benton-Franklin Health District Lab	7102 West Okanogan Place Kennewick, WA	(509) 460-4206	www.bfhd.wa.gov	Nitratos - $24 Coliforme - $24
Cascade Analytical Inc. - Yakima	1008 West Ahtanum Road, #2 Yakima, WA	(509) 452-7707	www.cascadeanalytical.com	Nitratos - $45 Coliforme - $25
Mukang Labs, Inc.	2526 E. Saint Helens Street Pasco, WA	(509) 544-2159	www.mukanglabs.com	Nitratos - $19 Coliforme - $19
Northwest Agricultural Consultants, Inc.	2545 West Falls Ave. Kennewick, WA	(509) 783-7450	www.nwag.com	Nitratos - $15 Coliforme - NA
Valley Environmental Laboratory	201 East D Street Yakima, WA	(509) 575-3999	http://www.valleylab.net/	Nitratos - $30 Coliforme - $20

Todos los laboratorios en éste documento están certificados por el Departamento de Ecología del Estado de Washington para probar nitratos en el agua potable Los laboratorios Ag Health Laboratories, Benton-Franklin Health District, Cascade Analytical, Mukang Labs, y Valley Environmental Laboratory también están certificados para probar la presencia de coliformes en el agua potable.

El costo por la prueba de nitratos y coliforme es aproximado y sujeto a cambio.

Para participar en este programa se requiere que tome una prueba de nitratos. La prueba para determinar la presencia de coliformes es recomendada pero no requerida.

Nitrate Treatment Pilot Program Frequently Asked Questions (FAQs)

Eligibility

Who is eligible for this program?
You are eligible if you live in a home located in the Lower Yakima Basin pilot project area, have a high nitrate level in your private well above 10 parts per million, and you or someone in your household is considered at high public health risk.

What is nitrate?
Nitrate is a chemical found in fertilizers, manure and septic tank liquids. Rain or irrigation water can carry nitrate down through the soil into groundwater. Your drinking water may contain nitrate if your well draws from this groundwater.

Who is considered a high public health risk from nitrate?
Children less than 12 months of age, pregnant women, or individuals susceptible to health problems from nitrate (as documented by their healthcare provider).

Why are pregnant women, infants and others at high public risk?
Nitrate is a potential human health threat especially to infants, causing the condition known as methemoglobinemia, also called "blue baby syndrome." Nitrate is taken in by eating food and drinking water. Nitrate is converted in the gut to nitrite, which then combines with hemoglobin to form methemoglobin, thus decreasing the ability of the blood to carry oxygen. Infants are more susceptible to nitrate toxicity than older children or adults. Fatalities are rare, but sub-acute methemoglobinemia can be limiting or asymptotic to an infant's development, making the condition particularly harmful and permanently debilitating. Chronic consumption of high levels of nitrate may also cause other health problems for those who have low resistance to infection.

How can I be considered for a free or low-cost treatment system?
To have a system installed at a reduced cost, you must show that nitrate in your water is greater than 10 parts per million. To be considered for a free system, you must also have someone in your home who is considered a high public health risk from nitrate—i.e., children less than 12 months of age, pregnant women, or individuals susceptible to health problems from nitrate, as documented by their healthcare provider.

Water Quality Testing - Q&A

Why should I test my water?
If you are on a private shallow well and have a household member considered a high public health risk, it is a good idea to test your water for nitrate. It is a colorless, odorless, and tasteless chemical that is only detectable by chemical testing. It is also a good idea to test for coliform.

How do I have my water tested?
Contact a certified testing laboratory for more information. The testing laboratory will provide you with the water bottle and instructions to properly test your water.

Where do I go to get my water tested?
After obtaining a water sample as directed by the certified lab, you will return the sample to the lab for analysis.

How much does the water test cost?
The water test for nitrate and coliform costs roughly $60.

What do my test results mean?
Nitrate results above 10 parts per million is above the Maximum Contaminant Level (MCL) and is considered a hazard.

Program Q&A

Why are you offering this program?
The funding is made possible by the State Legislature and Senator Jim Honeyford in response to high nitrate levels that have been found in private wells in the Lower Yakima Basin. This program will address immediate high nitrate concern by including education related to nitrate contamination, financial assistance in obtaining effective in-home point-of-use water treatment, and other types of technical assistance associated with the operation and maintenance of in-home treatment devices. The program is administered through the Washington State Department of Health. There is a second program administered by the State Department of Ecology to address groundwater contamination.

Screening Criteria

How will you decide who gets these systems?
To be eligible to have a water treatment system installed at no cost, your water must have a nitrate level greater than the Environmental Protection Agency's (EPA) drinking water standard of 10 milligrams per liter (mg/l), and your home must have an individual at high public health risk from nitrate. If the number of households eligible for financial assistance exceeds the funds available, then the following criteria will be used in the order presented to prioritize and select the households that will receive financial assistance. Eligible households that do not receive financial assistance will be offered the option of purchasing a system at a reduced cost.

1. Household income level. All other things being equal, a higher priority will be given to low income households.
2. Nitrate levels based on test results from a certified lab. All other things being equal, a higher priority will be given to those households having the highest nitrate levels. Nitrate levels will be classed into groups for prioritization. The lower the group number, the higher the priority.

   Nitrate Level

   a. Group 1 = greater than 40 mg/l
   b. Group 2 = greater than 30 mg/l to 40 mg/l
   c. Group 3 = greater than 20 mg/l to 30 mg/l
   d. Group 4 = 10 mg/l to 20 mg/l

3. First come, first served. All other things being equal, a higher priority will be given to households based on the order in which requests for financial assistance are received by the Department.

How many systems are available through this program?
Approximately 300 will be available at no cost; after that, remaining applicants will be offered assistance at a reduced cost.

What is the deadline to apply?
Applications received by January 28, 2011 will receive first priority. Applications will be accepted until April 29, 2011.

If I'm eligible, when will I hear from you?
We will respond within three weeks of receiving your application.

What costs does the program cover? What costs will I have to pay?
The program covers only the installation of a one-point treatment system. Maintenance of the system is at the homeowner's expense.

Nitrate Treatment Options

The two most common types of treating nitrate are Point of Use (POU) filter system and Point of Entry (POE) filter system.

The basic difference is that POU filter systems treat water at a single tap, normally at a kitchen sink, and POE filter systems treat water used throughout the house, normally installed with plumbing just before it enters the house so that treated water is available throughout the house.

Three types of treatment systems that can remove nitrate from your water are:

1. Reverse Osmosis Unit - Reverse osmosis (RO) is the most economical method of removing 90% to 99% of all contaminants. The pore structure of RO membranes is much tighter than ultrafiltration (UF) membranes. RO membranes are capable of rejecting practically all particles, bacteria and organics >300 daltons molecular weight (including pyrogens). In fact, reverse osmosis technology is used by most leading water bottling plants.

2. Distillation Unit - is probably the oldest method of water purification. Water is first heated to boiling. The water vapor rises to a condenser where cooling water lowers the temperature so the vapor is condensed, collected and stored. Most contaminants remain behind in the liquid phase vessel. However, there can sometimes be what is called carry-overs in the water that is distilled. Organics **such as herbicides and pesticides,** with boiling points lower than 100°C cannot be removed efficiently and can actually become concentrated in the product water. Another disadvantage is cost. Distillation requires large amounts of energy and water.

3. Anion or Cation Exchange Unit – is a technique used to chemically alter the electrical charge of atoms in water – positive (cations) and negative (anions). Water softener uses this concept to alter hardness in water. This technology however is less effective in treating nitrate.

Important: All POU and POE filter systems or treatment units need maintenance to operate effectively. If they are not maintained properly, contaminants may accumulate in the units and make your water worse. In addition, some vendors may make claims about their effectiveness that are not based on science. The EPA does not test or certify treatment units, but two organizations that do are NSF International and Underwriters Laboratory.

Bottled Drinking Water - If installing a nitrate treatment system is not an option for you, you may consider purchasing bottled water for drinking and cooking from any local grocery store. There are also places where you can purchase clean drinking water by the gallon and you are allowed to bring your own water jugs. This, however, will be the most expensive option over time.

Fact sheet on Reverse Osmosis (RO) – Treatment Considerations, (limitations, costs, operation and maintenance)

What are the limitations of a reverse osmosis (RO) treatment system?
Reverse osmosis treatment systems are affected by the quality of the raw water entering the system. Hardness, iron level, total dissolved solids, pH, temperature and pressure all affect how well a system will perform and the cost of maintaining a system.

RO treatment systems are not appropriate for treating water contaminated by coliform bacteria. If bacteria are found in the water, then the contractor will install an ultraviolet light ahead of the treatment system to inactivate the bacteria.

What are the maintenance requirements of an RO treatment system?
Filters must be changed on a regular basis. The time between changes will vary depending on the volume of water used and the quality of the incoming water. On average, filters will need to be changed once a year and the membrane should be replaced every 2 to 4 years.

Water tests are also recommended to ensure the system is functioning properly. The system installer will check the system once a year at no charge to see if it is functioning properly. You may also periodically test for nitrate by purchasing and using nitrate test strips similar to what was included in the letter from Yakima County.

What are the costs?
Costs include initial installation costs, operating costs and maintenance costs.

Homes selected for financial assistance will have systems installed at no cost. Homes not selected will be eligible to have systems installed at a reduced cost. The reduced cost is estimated between $695 and $990, depending on the type of system you need.

Electricity to pump the water and in some cases to operate an ultraviolet light are the only operating costs. Because RO treatment systems waste approximately two gallons for every gallon produced, your well pump will need to operate slightly longer.

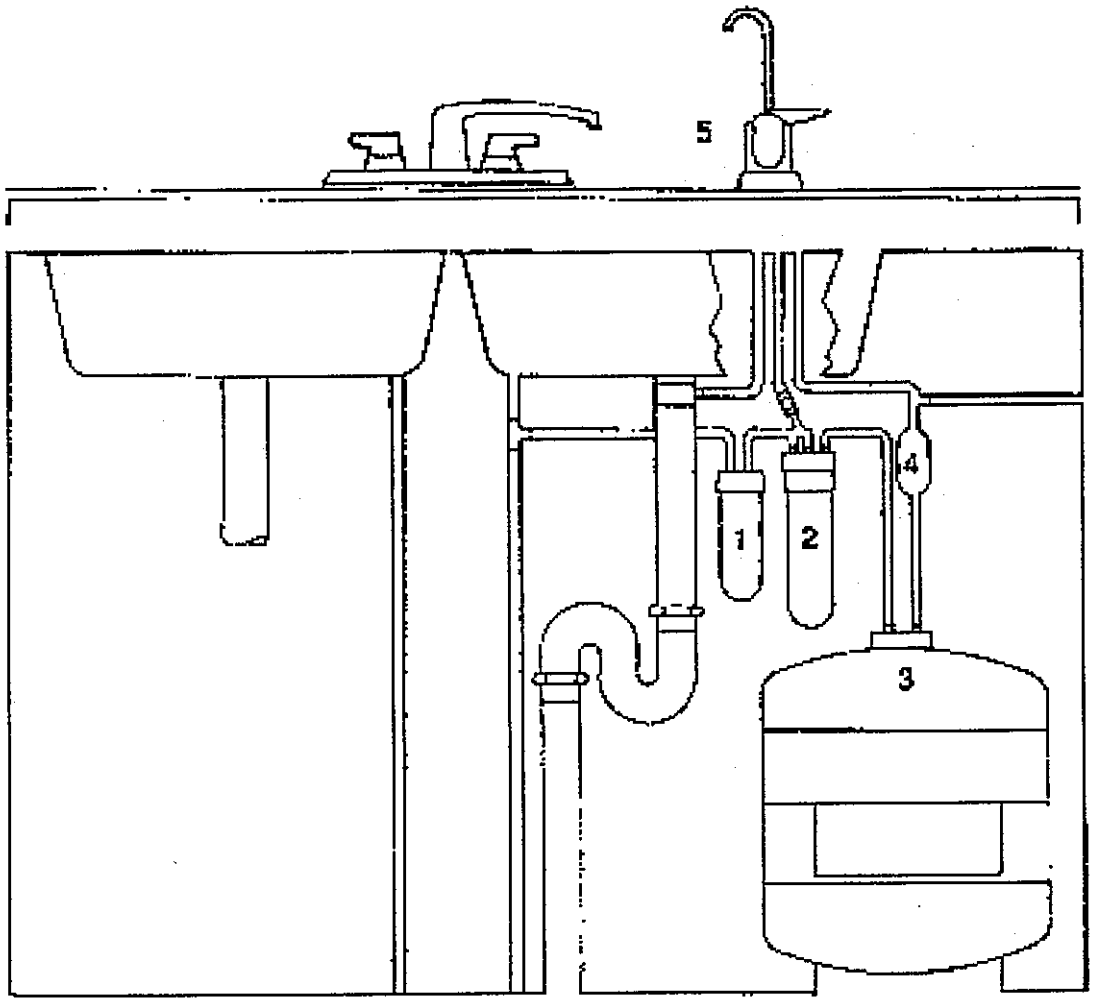
The system will require periodic maintenance to be effective. A maintenance program being offered by the system installer will cost $18.95 per month for a typical system. Alternatively, the homeowner can purchase the filters and membrane and perform the basic maintenance themselves for approximately $60 per year. Installations with hard water, high iron or total dissolved solids may require more frequent filter changes resulting in higher maintenance costs.

Maintenance costs for a treatment system are generally significantly less than the cost of bottled water. As a comparison, a gallon of bottled water costs approximately $1 and typical maintenance costs are approximately $1 for 10 gallons of water treated.

What is a reverse osmosis (RO) system? How does it work?

Reverse osmosis is a high efficiency filtering treatment system. It is the most common treatment technology used by premium bottled water companies and has been used as a home water purification system as early as the 1970s. It is effective in eliminating or substantially reducing a very wide array of contaminants, and of all technologies used to treat drinking water in residential applications, it has the greatest range of contaminant removal.

Reverse Osmosis (RO) System - Where is it installed? What type of maintenance is required?
Reverse Osmosis (RO) is normally installed under a kitchen sink as shown on the figure below.



Source: North Dakota State University

A Typical Home RO System Includes: (1) particle filter, (2) reverse osmosis membrane unit, (3) pressurized treated-water storage container, (4) carbon absorption post-filter, and (5) separate treated-water tap.

I am a renter. Can I have the system installed, or will my landlord (homeowner) do it?
Renters can have a system installed only with the homeowner's permission.

What are the ongoing costs of the system? Who pays for that?
It is estimated that installation of the system will cost around $800 per unit. Maintenance of the system, which includes periodic replacement of filter cartridges, is about $20 a month.

I can't afford any of this. What next?
Priority is given to homes with high health risks. If there is extra funding, this will be made available to others. Unfortunately, only limited funding is available. If you have an immediate concern about your private well, you may want to consider purchasing bottled water for drinking and cooking.

Does the system protect me from all the "bad stuff" in my water supply?
The nitrate treatment system will treat most contaminants, but not all. The water sample will identify the contaminants present in your water. The system installer can provide advice if there are other contaminants other than nitrate present in your water source.

What happens if I have high nitrate and don't do anything about it?
The good news is, most healthy people are not at risk from nitrate. However, please review **"Why are pregnant women, infants and others at high public risk?"**

If I have questions, who can I talk to?
For the Nitrate Treatment Program, contact the Yakima County Public Services Nitrate Hotline at 855-740-8429. For health concerns or questions, contact the Yakima Health District at 800-535-5016. Or visit our website at www.yakimacounty.us/nitrateprogram.

Preguntas frecuentes sobre el Programa Piloto de Tratamiento de Nitrato

Elegibilidad

¿Quién es elegible para participar en este programa?

Usted es elegible si vive en una casa localizado en el área del proyecto piloto de la cuenca del Valle de Yakima baja, si tiene un alto nivel de nitrato en su pozo privado superior a 10 partes por millón y si alguien en su casa es considerado a alto riesgo de salud pública.

¿Qué es el nitrato?

Nitrato es un químico que se encuentra en fertilizantes, estiércol y en líquidos de fosas sépticas. La lluvia o el agua de irrigación pueden acarrear el nitrato a través del suelo hacia el agua subterránea. Puede ser que su agua para beber contenga nitrato si su pozo extrae esta agua subterránea.

¿Quién es considerado en alto riesgo de salud pública por nitrato?

Niños menores de 12 meses de edad, mujeres embarazadas o personas susceptibles a problemas de salud por nitrato (según lo documente su proveedor de cuidado de la salud).

¿Por qué las mujeres embarazadas, bebés y otras personas están en alto riesgo público?

El **Nitrato** es una amenaza potencial a la salud humana especialmente para los bebés, causando la condición conocida como metahemoglobinemia, también llamada "síndrome de bebé azul". El nitrato es tomado por medio de alimentos y agua para beber, el intestino convierte el nitrato en nitrito, el cual luego se combina con la hemoglobina para formar metahemoglobina, por lo tanto disminuyendo la habilidad de la sangre de acarrear oxígeno. Los bebés son más susceptibles a la toxicidad del que los niños más grandes o que los adultos. Las fatalidades son raras, pero la metahemoglobinemia subaguda puede ser exclusiva o sintomática para el desarrollo de un bebé, haciendo que la condición sea particularmente dañina y permanentemente debilitante. El consumo crónico de altos niveles de nitrato también puede causar otros problemas de salud para aquellos que tengan baja resistencia a las infecciones.

¿Cómo puedo ser considerado para un sistema de tratamiento gratis o a bajo costo?

Para que le instalen un sistema a bajo costo, debe mostrar el nitrato en su agua es mayor a 10 partes por millón. Para ser considerado para un sistema gratis, también debe tener a alguien en su casa que sea considerado a alto riesgo de salud pública por nitrato—por ejemplo, niños menores de 12 meses, mujeres embarazadas o personas susceptibles a problemas de salud por nitrato, según sea documentado por su proveedor de cuidado de la salud.

Prueba de calidad del agua – P y R

¿Debo hacer una prueba a mi agua?

Si usted tiene un pozo de poco profundo y tiene un miembro en su casa considerado en alto riesgo de salud pública, es buena idea hacer una prueba a su agua por **nitrato**. Este es un químico incoloro e insaboro que únicamente es detectable por pruebas químicas. También es buena idea hacer la prueba para coliformes.

¿Cómo puedo hacer la prueba a mi agua?

Para más información comuníquese con un laboratorio certificado. El laboratorio que haga la prueba le proveerá con la botella de agua y las instrucciones para hacer la prueba apropiadamente a su agua.

¿A dónde debo ir para que le hagan la prueba a mi agua?

Después de obtener una muestra de agua como lo indique el laboratorio certificado, usted regresará la muestra al laboratorio para que hagan el análisis.

¿Cuánto cuesta la prueba del agua?

La prueba del agua para nitrato y para coliformes cuesta aproximadamente $60.

¿Qué significan los resultados de mi prueba?

Los resultados de nitrato arriba de 10 partes por millón son superiores al Nivel Máximo de Contaminación (MCL) y esto se considera un peligro.

Programa P y R

¿Por qué se está ofreciendo este programa?

El financiamiento es posible por la Legislatura del Estado y al Sen. Jim Honeyford en respuesta a altos niveles de nitrato que se han encontrado en pozos privados en el Bajío del Valle Bajo de Yakima. Este programa tratará inmediatamente el problema de alto nitrato incluyendo educación relacionada con la contaminación por nitrato, asistencia financiera en la obtención de tratamiento de agua efectivo en el punto de uso en la casa y otros tipos de asistencia técnica asociada con la operación y mantenimiento de los aparatos de tratamiento en la casa. El programa es administrado a través del Departamento de Salud del Estado de Washington. Existe un segundo programa administrado por el Departamento de Ecología del Estado para tratar la contaminación del agua subterránea.

¿Quién decidirá quien tendrá estos sistemas?

Para ser elegible para que se le instale un sistema de tratamiento de sin costo, su agua debe tener un nivel de nitrato más alto que el estándar establecido por la Agencia de Protección de Ambiente (EPA) para agua potable de 10 miligramos por litro (mg/l) y la casa debe tener por lo menos una persona con alto riesgo de salud por nitrato. Si el número de hogares elegibles para recibir ayuda financiera excede los fondos disponibles, entonces se usará el siguiente criterio en el orden presentado para dar prioridad y seleccionar a los hogares que recibirán ayuda financiera. A los hogares elegibles que no reciban ayuda financiera se les ofrecerá la opción de comprar un sistema a bajo costo.

1. Nivel de ingreso del hogar. Todas las otras cosas siendo iguales, se le dará mayor prioridad a los hogares de bajo ingreso.
2. Nivele de nitrato basado en los resultados de la prueba de un laboratorio certificado. Todas las otras cosas siendo iguales, se le dará mayor prioridad a aquellos hogares que tengan el nivel más alto de nitrato. Para dar prioridad, los niveles de nitrato pueden clasificarse en grupos. Entre más bajo sea el número del grupo, más alta será la prioridad.

   Nivel de Nitrato

   a. Grupo 1 = mayor a 40 mg/l
   b. Grupo 2 = mayor a 30 mg/l a 40 mg/l
   c. Grupo 3 = mayor a 20 mg/l a 30 mg/l
   d. Grupo 4 = 10 mg/l a 20 mg/l
3. Orden de llegada de las solicitudes. Todas las otras cosas siendo iguales, se le dará mayor prioridad a los hogares en base al orden en que el Departamento reciba las solicitudes de ayuda financiera.

¿Cuántos sistemas hay disponibles por medio de este programa?

Habrá aproximadamente 300 unidades gratis; después de eso, a los solicitantes restantes se les ofrecerá asistencia a un costo reducido.

¿Cuál es el plazo para hacer la solicitud?

Las solicitudes que se reciban para el 28 de enero, 2011 tendrán primera prioridad. Se aceptarán solicitudes hasta el 29 de abril, 2011.

¿Si soy elegible, ¿cuándo tendré noticias suyas?

Nosotros le responderemos en tres semanas después de recibir su solicitud.

¿Qué costos cubre el programa? ¿Cuáles costos tengo que pagar yo?

El programa cubre únicamente la instalación de un sistema de tratamiento en un punto de uso. El mantenimiento del sistema es a costo del propietario de la casa.

Opciones de tratamiento para nitrato

Los dos tipos más comunes de tratamiento de nitrato son el sistema de filtración en punto de uso (POU) y el sistema de filtración en punto de entrada (POE).

La diferencia básica es que los sistemas de filtración POU tratan el agua en una sola llave, normalmente en el fregador de la cocina, y; los sistemas de filtración POE tratan el agua que se usa en toda la casa, normalmente se instala con plomería justo antes que entre a la casa para que el agua tratada esté disponible en toda la casa.

Tres tipos de sistemas de tratamiento de agua que pueden remover el nitrato de su agua son:

1. Unidad de Reversión de Osmosis – La reversión de osmosis (RO) es el método más económico para remover de 90% a 99% de todos los contaminantes. La estructura de poros de las membranas RO es mucho más cerrada que la las membranas de ultrafiltración (UF). Las membranas RO son capaces de rechazar prácticamente todas las partículas, bacteria y orgánicos >300 Dalton de peso molecular (incluyendo pirógenos). De hecho, la tecnología de reversión de osmosis es usada por la mayoría de las plantas principales de embotellamiento de agua.

2. Unidad de destilación Unit – Es probable el método más antiguo de purificación de agua. Primero el agua se calienta hasta hervir. El vapor de agua se eleva a un condensador donde agua fría baja la temperatura para que el vapor sea condensado, recolectado y almacenado. La mayoría de los contaminantes permanecen en la fase del recipiente del líquido. Sin embargo, algunas veces en el agua destilada puede haber lo que es llamado acarreados. Sustancias orgánicas **como herbicidas y pesticidas,** con puntos de ebullición menores a 100°C no pueden ser removidos eficientemente y pueden concentrarse en el agua producida. Otra desventaja es el costo. La destilación requiere grandes cantidades de energía y agua.

3. Unidad Anión o Intercambio de Cationes – Es una técnica a usada para alterar químicamente la carga eléctrica de los átomos en el agua – positiva (cationes) y negativa (aniones). El descalcificador de agua usa este concepto para alterar la dureza en el agua. Sin embargo esta tecnología es menos efectiva para tratar nitrato.

Importante: Todos los sistemas de filtración POU y POE y unidades de tratamiento necesitan mantenimiento para funcionar. Si no se les da el mantenimiento apropiado, los contaminantes pueden acumularse en las unidades y empeorar su agua. Además, quizás algunos vendedores hagan afirmaciones sobre su efectividad que no están basada en la ciencia. EPA no hace pruebas ni certifica unidades de tratamiento, pero dos organizaciones que si lo hacen son NSF International y Underwriters Laboratory.

Agua embotellada para beber – Si instalar un sistema de tratamiento a nitratos no es una opción para usted, debería considerar comprar agua embotellada para beber y cocinar de cualquier supermercado local. También hay lugares donde puede comprar por galón agua limpia para beber y le permiten llevar sus propios garrafones para el agua. Sin embargo, con el tiempo, esta será la opción más costosa.

Hechos sobre la Reversión de Osmosis (RO) – Consideraciones de tratamiento, (limitaciones, costos, operación y mantenimiento)

¿Cuáles son las limitaciones de un sistema de tratamiento de reversión de osmosis (RO)?

Los sistemas de reversión de osmosis se ven afectados por la calidad del agua sin tratar que entre al sistema. La dureza, el nivel de hierro, el total se sólidos disueltos, el pH, la temperatura y presión afectan lo bien que va a funcionar un sistema y el costo de mantener un sistema.

Los sistemas de RO no son apropiados para tratar agua contaminada por bacterias coliformes. Si se encuentra bacteria en el agua, entonces el contratista instalará una luz ultravioleta antes del sistema de tratamiento para inactivar la bacteria.

¿Cuáles son los requerimientos de mantenimiento de un sistema de tratamiento RO?

Los filtros se deben cambiar de manera regular. El tiempo entre cambios variará dependiendo del volumen de agua usada y de la calidad del agua que llegue. En promedio, los filtros necesitarán cambiarse una vez al año y la membrana deberá reemplazarse cada 2 ó 4 años.

También se recomienda que se hagan pruebas de agua para asegurar que el sistema está funcionando apropiadamente. El instalador del sistema revisará el sistema una vez al año sin cargo alguno para ver si está funcionando apropiadamente. Usted también puede hacer una prueba periódica por nitrato comprando y usando tiras de prueba de nitrato similar a la que se incluyeron en la carta del Condado de Yakima.

¿Cuáles son los costos?

Los costos incluyen los de instalación inicial, de operación y de mantenimiento.

A las casas seleccionados para asistencia financiera se les instalará el sistema sin costo alguno. Las casas que no sean seleccionados serán elegibles para que se les instale el sistema a costo reducido. El costo reducido se estima que es entre $695 y $990, dependiendo del tipo de sistema que usted necesite.

La electricidad para bombear el agua y en algunos casos para operar la luz ultravioleta son los únicos costos. Debido a que los sistemas de tratamiento RO desperdician aproximadamente dos galones por cada galón producido, su bomba del pozo necesitará operar ligeramente por más tiempo.

Para ser efectivo el sistema requerirá mantenimiento periódico. Para un sistema típico, un programa de mantenimiento que ofrece el instalador del sistema costará $18.95 por mes. De manera alternativa, el propietario dla casa puede comprar los filtros y la membrana y desempeñar el mantenimiento básico él mismo a un costo aproximado de $60 por año. Las instalaciones con niveles de agua dura, alto hierro o total de sólidos disueltos quizás requieran cambios de filtro más frecuentes resultando en costos de mantenimiento más altos.

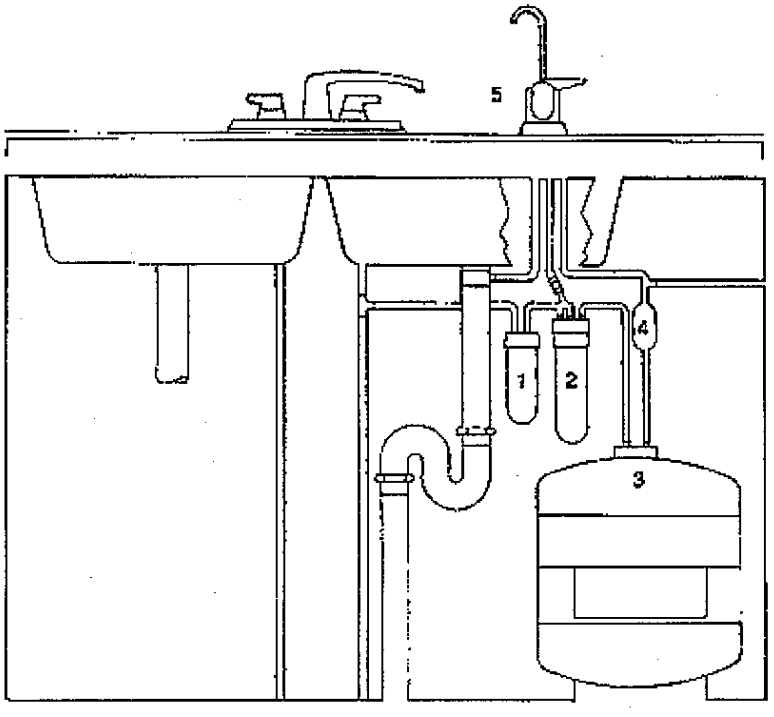
Los costos de mantenimiento para un sistema de tratamiento son generalmente significativamente menores que el costo de comprar agua embotellada. Como comparación, un galón de agua embotellada cuesta aproximadamente $1 y los costos de mantenimiento típico son aproximadamente de $1 por 10 galones de agua tratada.

¿Qué es u sistema de reversión de osmosis (RO)? ¿Cómo funciona?

La reversión de osmosis es un sistema de tratamiento altamente eficiente. Es la tecnología de tratamiento más común usado por compañías de agua embotellada de alta calidad y ha sido usado como un sistema de purificación de agua en la casa desde los años 1970. Es efectivo en la eliminación o en la reducción sustancial de una amplia variedad de contaminantes, y de todas las tecnologías usadas para tratar agua para beber en aplicaciones residenciales, tiene el ámbito más amplio de remoción de contaminantes.

Sistema de reversión de osmosis (RO) - ¿Dónde se instala? ¿Qué tipo de mantenimiento requiere?

El sistema de reversión de osmosis (RO) se instala normalmente debajo del fregador de la cocina así como se muestra en la ilustración de abajo.



Fuente: Universidad del Estado de Dakota del Norte

Un sistema Ro de u hogar típico incluye: (1) filtro de partículas, (2) unidad de membrana de reversión de osmosis, (3) recipiente de almacenamiento de agua tratada presurizada, (4) filtro posterior de absorción de carbón, y (5) llave aparte del agua tratada.

Soy arrendatario. ¿Pueden instalarme el sistema o lo hará el propietario?

Los arrendatarios pueden tener el sistema instalado sólo con el permiso del propietario.

¿Cuáles son los costos continuos del sistema? ¿Quién paga eso?

Se estima que la instalación del sistema costará aproximadamente $800 por unidad. El mantenimiento del sistema, el cual incluye reemplazo periódico de los cartuchos de los filtros, es aproximadamente de $20 al mes.

No puedo pagar esto. ¿Qué otra opción sigue?

Se les da prioridad a las casas con alto riesgo de salud. Si hay fondos extra, esto se hará disponible para otros. Desafortunadamente, sólo hay disponibles fondos limitados. Si usted tiene alguna preocupación inmediata sobre su pozo privado, quizás quiera considerar comprar agua embotellada para beber y cocinar.

¿El sistema me protege de todas las "cosas malas" que hay en mi agua?

El sistema de tratamiento de nitrato tratará con la mayoría de los contaminantes, pero no todos. La muestra de agua identificará los contaminantes presentes en su agua. El instalador del sistema puede proveerle evidencia de la existencia de otros contaminantes aparte del nitrato presente en su fuente de agua.

¿Qué sucede si tengo un alto nivel de nitrato y no hago nada?

Las buenas noticias son, la mayoría de la gente saludable no está en riesgo por nitrato. Sin embargo, para más información sobre el impacto del nitrato en personas en alto riesgo de salud pública, por favor revise "**¿Por qué las mujeres embarazadas, bebés y otras personas están en alto riesgo público?"**

¿Si tengo preguntas, con quién puedo hablar?

Para el Programa de Tratamiento de Nitrato, comuníquese con la línea directa de nitrato de los Servicios Públicos de del Condado de Yakima al 855-740-8429. Para preocupaciones de la salud o preguntas, comuníquese con el Distrito de Salud de Yakima al 800-535-5016. O visite nuestro sitio en el Internet en: www.yakimacounty.us/nitratoprogram.

Private Well Water

Coliform Bacteria and Nitrate Information for Private Well Users

Why should my well water be tested?

Drinking contaminated water is a health risk. Some contaminants cannot be seen, smelled, or tasted. Two of the most common contaminants in drinking water are coliform bacteria and nitrate and they can be harmful.

Who should be testing my well water?

You or your landlord. Private well users are responsible for testing their own water. If you don't own your home but you use a private well, talk with your landlord about getting your water tested or seeing the most recent results. You can always take a water sample yourself and have it tested.

What should I test for and how often?

The Department of Health recommends that you test your private well water every year for coliform bacteria and nitrate.

You should also test your water when:

- You notice a change in your water, such as taste, color, or smell.*
- Your well has been flooded.
- You replace any part of your well system.
- Someone in your household is pregnant, nursing, or has an unexplained illness and you suspect your water may be at risk.
- You hear that a neighbor's water is contaminated.
- You live near industrial or agricultural activities.*

*These may require testing for something other than coliform or nitrate.

If you have had previous contamination problems or are concerned about specific contaminants, you may want to test your well water more often.

Where do I go to get my water tested?

Certified drinking water labs are located across the state. The lab you select or your local health department can help you decide what to test for, how to collect samples, and how to understand results. There is a cost for these tests. Costs this year (2010) range from $20 to $25 per test for coliform bacteria, and $30 to $42 per test for nitrate. Most labs like to provide their own sample bottles.

My nitrate level is *less than* 10 ppm, what should I do?

Nitrate levels can vary throughout the year, so if your level is 5 ppm or higher, you may want to re-sample in six months.

My nitrate level is *more than* 10 ppm, what should I do?

If your nitrate test shows levels higher than 10 parts per million, find a different and safe drinking water supply. The quickest thing to do is to begin using bottled water for drinking and food preparation. Do NOT boil water with high nitrate. Boiling water may actually increase the nitrate level, making the problem worse!

Another option is to install a device or filter designed to remove nitrate from your water. These devices are often installed on kitchen faucets, where people get their water for drinking and cooking. Nitrate is not absorbed through the skin, so it is safe to clean and bathe with it.

Other, longer term solutions include:

- Drilling a deeper well into a different groundwater source;
- Connecting to a public water system; or
- Working with others in your community to develop a new public water system to serve your home and nearby neighbors.

My test results came back with coliform in the water, what should I do?

Coliform tests usually come back as SATISFACTORY or UNSATISFACTORY. If you receive a SATISFACTORY report, it means your water was free of these bacteria at the time of the sample. Be sure to test every year for coliform bacteria.

If you receive an UNSATISFACTORY report, it may be contaminated. Do not drink the water until it tests SATISFACTORY. Find a different and safe drinking water supply. The quickest thing to do is either begin using bottled water or boil all water for drinking and food preparation. This also includes water used for making ice or coffee, brushing teeth, and washing fruits and vegetables you eat raw. Boiling water rapidly for one minute usually kills bacteria.

Your lab and local health department can help you determine if you should resample, disinfect your well, or take other action based on your results.

What are coliform bacteria and why should I care?

Coliform bacteria are organisms that are present in the environment and in the feces of humans and animals. Coliform bacteria will not likely cause illness, but their presence in drinking water indicates disease-causing organisms may also be present.

What is nitrate?

Nitrogen is a chemical found in most fertilizers, animal manure, and in septic tanks. Natural bacteria in the soil can change nitrogen into nitrate. Rain water and irrigation water can carry nitrate down through the soil into the groundwater.

What can nitrate do to me?

Too much nitrate in your body makes it harder for red blood cells to carry oxygen. While many people do not notice a difference, this can be very dangerous for infants and pregnant women. Infants exposed to high amounts of nitrate may develop "blue-baby syndrome," a condition that is rare but can be fatal.

What are the symptoms of blue-baby syndrome?

Symptoms can be confused with other illnesses. An infant with mild to moderate blue-baby syndrome may have diarrhea, vomiting, and be lethargic.

In more serious cases, the infant may have:

- skin that becomes gray, darker brown, or blue, or
- lips, finger or toe nails with a blue-like color, or
- trouble breathing.

My test results came back with *both* coliform and nitrate, what should I do?

Find a different and safe drinking water supply. The quickest thing to do is to begin using bottled water for drinking and food preparation. Boiling water kills coliform bacteria, but does not remove nitrate. Do NOT boil water with both coliform and nitrate. It may increase the nitrate level, making the problem worse! See other options under nitrate and coliform above.

My test results came back OK, but I don't like the taste/smell/ appearance of my water. What is wrong with it?

Some contaminants make water smell, taste, or look bad but are not harmful to your health. Your lab and local health department can help you determine if you need to test or treat your water.

What about Home Water Treatment Units? I've heard that these can help.

Point of use (POU) filter systems treat water at a single tap. Point of entry (POE) filter systems treat water used throughout the house.

Three types of systems that can remove nitrate from your water are:

- Reverse Osmosis Unit
- Distillation Unit
- Anion Exchange Unit

Important: All POU and POE filter systems or treatment units need maintenance to operate effectively. If they are not maintained properly, contaminants may accumulate in the units and make your water worse. In addition, some vendors may make claims about their effectiveness that are not based on science. The EPA does not test or certify treatment units, but two organizations that do are NSF International and Underwriters Laboratory.

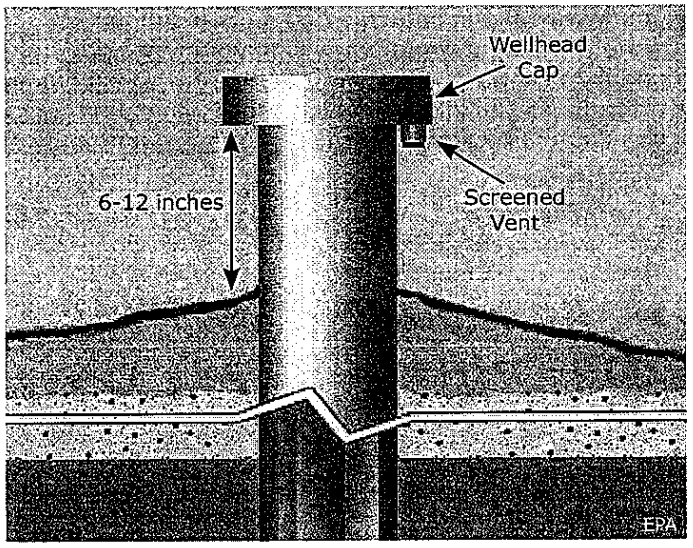
How can I protect my well water from contamination?

Make sure your wellhead extends 6 to 12 inches above the surface of the ground and is capped to keep contaminants out. Seal the ground around the wellhead and slope it away so water does not collect and seep into the well.

It is important to keep your well safe from potential contaminants that may be around your home. The further away from contamination sources, the better.

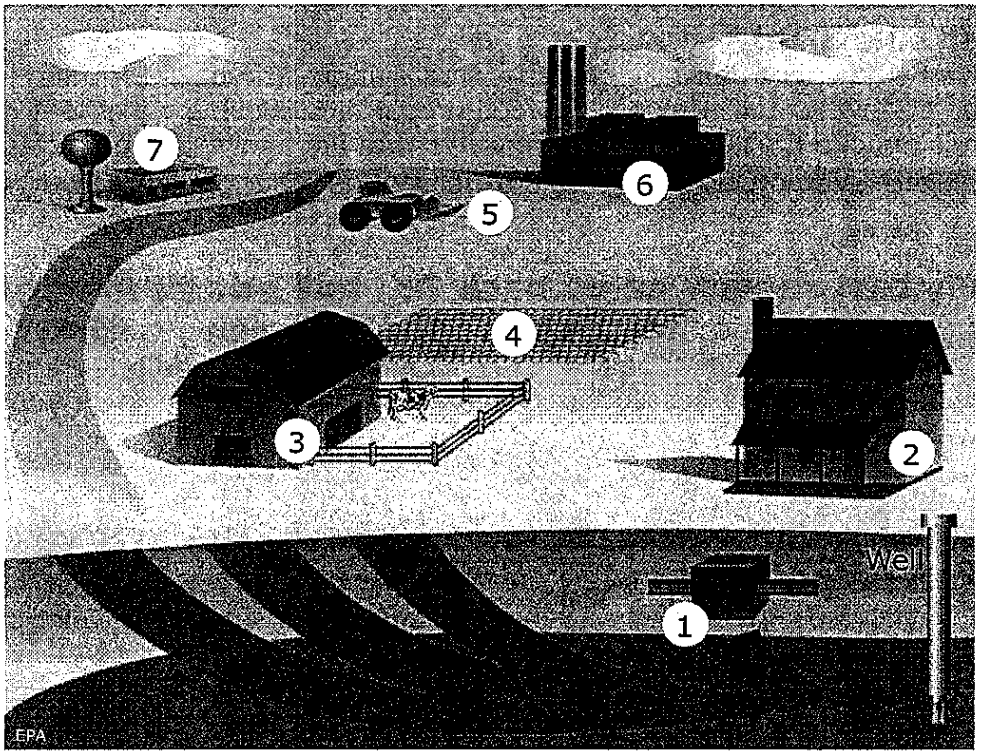
Experts suggest your well should be at least:

- 50 feet from a septic tank,
- 100 feet from the edge of a drainfield, fuel tank, barn, and any storage shed for fertilizers and pesticides, and
- 250 feet from a manure stack.



Potential Well Contaminants

1. Septic Tank
2. Household Wastes
3. Livestock Wastes
4. Pesticides and Fertilizers
5. Landfills
6. Local Industries
7. Underground Storage Tanks



Additional Resources

Local Health Departments
www.doh.wa.gov/LHJMap/LHJMap.htm

Certified Labs in Your Area
www.ecy.wa.gov/apps/eap/acclabs/labquery.asp

Certifying Organizations for Home Water Treatment Units
NSF International (Formerly National Sanitation Foundation), www.nsf.org
Underwriters Laboratory, www.ul.com

Center for Disease Control and Prevention Publications
Private Wells, www.cdc.gov/healthywater/drinking/private/wells/location.html
Emergency disinfection of wells, http://emergency.cdc.gov/disasters/wellsdisinfect.asp

Environmental Protection Agency Publications
Household wells, www.epa.gov/safewater/privatewells/pdfs/household_wells.pdf
Secondary Standards, www.epa.gov/safewater/consumer/2ndstandards.html
Filtration Facts booklet, www.epa.gov/safewater/faq/pdfs/fs_healthseries_filtration.pdf
Source Water Protection, http://cfpub.epa.gov/safewater/sourcewater

Washington State Department of Health
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For persons with disabilities, this document is available in other formats. To make a request, call 1-800-525-0127 or 1-800-833-6388 (TTY/TDD).

Agua de Pozos Privados

Información sobre las bacterias coliformes y el nitrato para usuarios de pozos privados

¿Por qué debería hacer un análisis del agua de mi pozo?

Beber agua contaminada es un riesgo para la salud. Algunos contaminantes no se pueden ver, oler ni notar por el sabor. Dos de los contaminantes más comunes del agua potable son las bacterias coliformes y el nitrato, los cuales pueden ser nocivos.

¿Quién debería analizar el agua de mi pozo?

Usted o su arrendador. Los usuarios de pozos privados son responsables de analizar su propia agua. Si usted no es propietario de su vivienda pero utiliza un pozo privado, hable con su arrendador para analizar el agua o ver los resultados más recientes. Siempre podrá tomar una muestra de agua usted mismo y hacerla analizar.

¿Qué debería buscar en el análisis y con qué frecuencia?

El Departamento de Salud recomienda que analice el agua de pozo privado todos los años para verificar que no existan bacterias coliformes y nitrato.

También deberá analizar el agua cuando:

- Note un cambio en el agua, tal como el sabor, color y olor.*
- El pozo se haya inundado.
- Reemplace cualquier parte de su sistema de pozo.
- Alguna mujer de su hogar esté embarazada, amamantando o tenga una enfermedad inexplicable y usted sospeche de que el agua puede estar en riesgo.
- Escuche que el agua de su vecino está contaminada.
- Viva cerca de zonas industriales o agrícolas.*

*Estos casos pueden requerir un análisis para evitar la existencia de otros elementos distintos de las coliformes o el nitrato.

Si ha tenido problemas de contaminación previos o está preocupado por contaminantes específicos, usted debería analizar el agua del pozo con mayor frecuencia.

¿Dónde me dirijo para analizar el agua?

Los laboratorios de análisis de agua potable certificados se encuentran en todo el estado. El laboratorio que seleccione o el departamento de salud local podrán ayudarlo a decidir qué buscar en el análisis, cómo tomar las muestras y cómo interpretar los resultados. Estos análisis tienen un costo. Los costos de este año (2010) van desde los $20 a los $25 por análisis de bacterias coliformes, y desde los $30 a los $42 para el análisis de nitrato. La mayoría de los laboratorios prefieren proporcionar sus propios recipientes para muestra.

El nivel del nitrato es *menor de* 10 ppm, ¿qué debo hacer?

Los niveles de nitrato pueden variar a lo largo del año, por lo tanto si el nivel es de 5 ppm o mayor, deberá volver a tomar una prueba dentro de seis meses.

El nivel de nitrato es *mayor de* 10 ppm, ¿qué debo hacer?

Si su análisis de nitrato muestra niveles mayores a 10 partes por millón, busque un suministro de agua potable diferente y más seguro. Lo primero que debe hacer es comenzar a utilizar agua embotellada para beber y cocinar. No hierva agua con altos niveles de nitrato. Hervir el agua puede incrementar el nivel de nitrato, ¡empeorando el problema!

Otra opción es instalar un dispositivo o filtro diseñado para eliminar el nitrato del agua. Estos dispositivos se instalan con frecuencia en los grifos de la cocina, donde las personas toman agua para beber y cocinar. El nitrato no se absorbe a través de la piel, por lo tanto es seguro utilizar esta agua para limpiar y bañarse.

Otras soluciones a largo plazo incluyen:

- Cavar un pozo más profundo en una fuente diferente de aguas subterráneas;
- Conectarse a un sistema de agua público; o
- Trabajar con otras personas de su comunidad para desarrollar un nuevo sistema público de agua para su hogar y los vecinos de la zona.

Los resultados de mi análisis indican coliformes en el agua, ¿qué debo hacer?

Los análisis de coliformes por lo general indican SATISFACTORIO o NO SATISFACTORIO. Si recibe un informe SATISFACTORIO, significa que su agua no contiene estas bacterias al momento de tomar la muestra. Asegúrese de realizar este análisis de coliformes todos los años.

Si recibe un informe NO SATISFACTORIO, el agua podría estar contaminada. No beba el agua hasta que el análisis sea SATISFACTORIO. Busque un suministro de agua potable distinto y seguro. Lo primero que debe hacer es comenzar a utilizar agua embotellada o hervida para beber y cocinar. Además, debe utilizarla para preparar hielo o café, lavarse los dientes y lavar frutas y verduras que come crudas. Hervir el agua durante un minuto por lo general mata las bacterias.

El laboratorio y el departamento de salud local pueden ayudarlo a determinar si debe volver a tomar una muestra, desinfectar el pozo o tomar otras medidas basadas en el resultado.

¿Qué son las bacterias coliformes y por qué debería tener cuidado?

Las bacterias coliformes son organismos que están en el medio ambiente y en las heces de humanos y animales. Las bacterias coliformes probablemente no causan enfermedades, pero su presencia en el agua potable indica que también puede haber organismos causantes de enfermedades.

¿Qué es el nitrato?

El Nitrógeno es un químico que se encuentra en la mayoría de los fertilizantes, en estiércol de animales y en los tanques sépticos. Las bacterias naturales de la tierra pueden cambiar el nitrógeno a nitrato. El agua de lluvia y el agua de riego pueden arrastrar el nitrato por debajo de la tierra hacia las aguas subterráneas.

¿Qué me puede hacer el nitrato?

El exceso de nitrato en el cuerpo dificulta el transporte de oxígeno que deben realizar los glóbulos rojos. Aunque muchas personas no noten la diferencia, esto puede ser muy peligroso para los bebés y las mujeres embarazadas. Los bebés expuestos a grandes cantidades de nitrato pueden desarrollar el "síndrome del bebé azul," una enfermedad extraña pero que puede ser fatal.

¿Cuáles son los síntomas del síndrome del bebé azul?

Los síntomas se pueden confundir con los de otras enfermedades. Un bebé con el síndrome del bebé azul leve a moderado puede tener diarrea, vómitos y estar apático.

En casos más graves el bebé puede tener:

- piel que cambia a color gris, café oscura o azul; o
- labios, dedos o las uñas de los pies de color azulado; o
- problemas para respirar.

Los resultados de mi análisis indican *tanto* coliformes *como* nitrato, ¿qué debo hacer?

Busque un suministro de agua potable distinto y seguro. Lo primero que debe hacer es comenzar a utilizar agua embotellada para beber y cocinar. Hervir el agua mata las bacterias coliformes, pero no elimina el nitrato. NO hierva agua con coliformes y nitrato. Puede incrementar el nivel de nitrato, ¡empeorando el problema! Consulte otras opciones bajo nitrato y coliformes más arriba.

Los resultados del análisis indican que está bien, pero no me gusta el sabor/olor/la apariencia del agua. ¿Qué está pasando?

Algunos contaminantes hacen que el agua no tenga buen olor, sabor o apariencia pero no son nocivos para su salud. Su laboratorio y el departamento de salud local pueden ayudarlo a determinar si necesita analizar o tratar su agua.

¿Qué son las unidades domésticas de tratamiento de agua? He escuchado que son útiles.

Los sistemas de filtro en el punto de uso (POU) tratan el agua en un sólo grifo. Los sistemas de filtro en el punto de entrada (POE) tratan el agua utilizada por toda la vivienda.

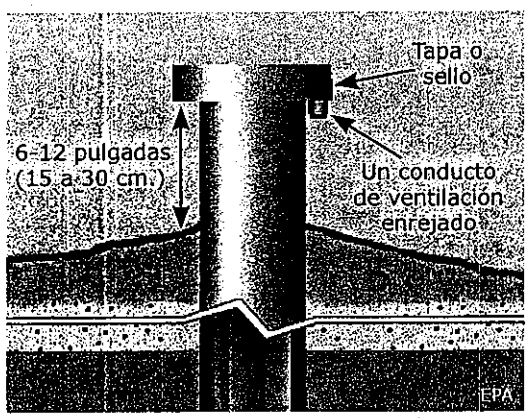
Los tres tipos de sistemas que peuden eliminar el nitrato del agua son:

- Unidad de ósmosis inversa
- Unidad de destilación
- Unidad de intercambio iónico

Importante: Todos los sistemas de filtro POU y POE o las unidades de tratamiento requieren mantenimiento para funcionar bien. Si no reciben el mantenimiento adecuado, los contaminantes se podrían acumular en las unidades y empeorar el agua. Además, algunos vendedores podrían declarar su efectividad aunque no esté basado en la ciencia. EPA no analiza ni certifica las unidades de tratamiento, pero sí lo hacen dos organizaciones: la NSF International y el Underwriters Laboratory.

¿Cómo puedo proteger el agua de mi pozo de la contaminación?

Asegúrese que la boca del pozo se extienda entre 6 a 12 pulgadas (15 a 30 cm.) por encima de la superficie del suelo y que esté tapado para que no entren los contaminantes. Selle el suelo alrededor de la boca del pozo y hágalo en declive para que el agua no se acumule y filtre dentro del pozo.



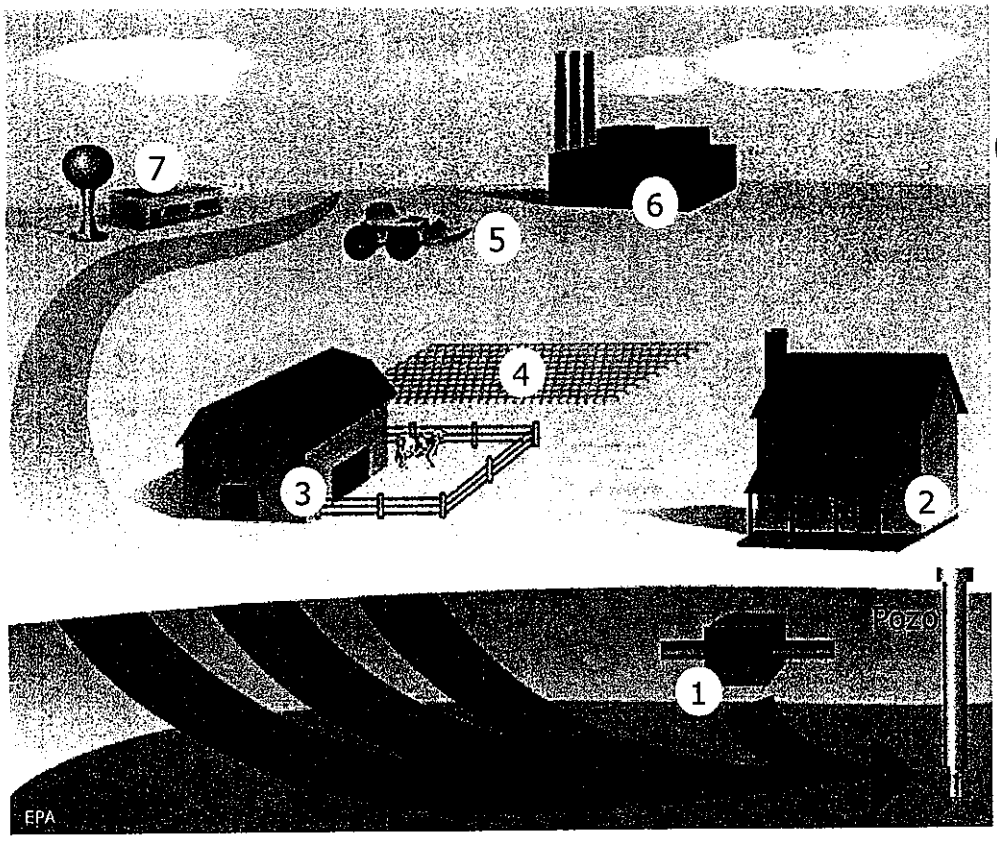
Es importante mantener el pozo protegido de contaminantes potenciales que pueden estar alrededor de su vivienda. Cuánto más lejos de las fuentes de contaminación, mucho mejor.

Los expertos sugieren que el pozo debe estar al menos:

- a 50 pies (15 metros) del tanque séptico,
- a 100 pies (30 metros) del borde de un campo de drenaje, tanque de combustible, graneros y cualquier depósito de fertilizantes y pesticidas, y
- a 250 pies (75 metros) de un montículo de estiércol.

Fuentes potenciales de contaminación del agua de pozos

1. Tanque séptico
2. Residuos domésticos
3. Residuos de animales
4. Pesticidas y fertilizantes
5. Vertedero
6. Industria local
7. Tanques de almacenamiento subterráneo



Recursos adicionales (información en inglés)

Departamentos de salud locales
www.doh.wa.gov/LHJMap/LHJMap.htm

Laboratorios certificados en su zona
www.ecy.wa.gov/apps/eap/acclabs/labquery.asp

Organizaciones certificadoras de unidades domésticas de tratamiento de agua
NSF International (Anteriormente, Fundación de Sanidad Nacional), www.nsf.org
Underwriters Laboratory, www.ul.com

Publicaciones del Centro para el Control y la Prevención de Enfermedades
Pozos privados, www.cdc.gov/healthywater/drinking/private/wells/location.html
Desinfección de emergencia de pozos, http://emergency.cdc.gov/disasters/wellsdisinfect.asp

Publicaciones de la Agencia de Protección Ambiental
Pozos domésticos, www.epa.gov/safewater/privatewells/pdfs/household_wells.pdf
Estándares secundarios, www.epa.gov/safewater/consumer/2ndstandards.html
Folleto sobre datos de filtración, www.epa.gov/safewater/faq/pdfs/fs_healthseries_filtration.pdf
Protección de fuente de agua, http://cfpub.epa.gov/safewater/sourcewater

Washington State Department of Health
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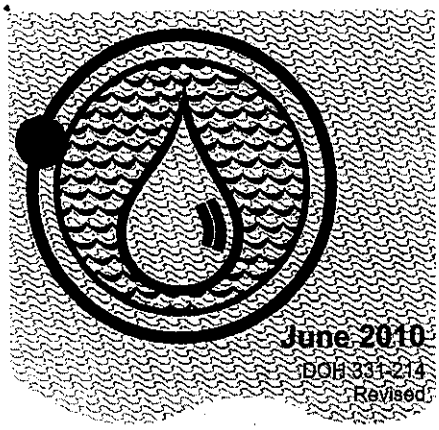
Para personas con discapacidades, este documento está disponible en otros formatos. Por favor llame al 1-800-525-0127 (TTY/TDD 1-800-833-6388).



Questions & Answers

Nitrate in Drinking Water

Nitrate is a chemical found in most fertilizers, manure, and liquid waste discharged from septic tanks. Natural bacteria in soil can convert nitrogen into nitrate. Rain or irrigation water can carry nitrate down through the soil into groundwater. Your drinking water may contain nitrate if your well draws from this groundwater.

Nitrate is an acute contaminant. That means one exposure can affect a person's health.

Does the state regulate nitrate in drinking water?

Yes. State law requires public water systems to sample for many contaminants, including nitrate, on a regular basis. Our drinking water quality standard for nitrate is 10 milligrams per liter (mg/L). Public water systems with nitrate levels over 10 mg/L must notify people who receive water from them.

How does nitrate affect health?

It reduces the ability of red blood cells to carry oxygen. In most adults and children, these red blood cells rapidly return to normal. However, in infants it can take much longer for the blood cells to return to normal. Infants who drink water with high levels of nitrate (or eat foods made with nitrate-contaminated water) may develop a serious health condition due to the lack of oxygen. This condition is called methemoglobinemia or "blue baby syndrome." Some scientists think diarrhea makes this problem worse.

Low levels of nitrate in water will not have a long-lasting effect on your baby. If your baby doesn't have any of signs of blue baby syndrome, you do not need to have a doctor test for methemoglobinemia.

What are the signs of blue baby syndrome?

Moderate to serious blue baby syndrome may cause brownish-blue skin tone due to lack of oxygen. This condition may be hard to detect in infants with dark skin. For infants with dark skin, look for a bluish color inside the nose and mouth, on the lips, or fingernail and toenail beds.

Mild to moderate blue baby syndrome may cause signs similar to a cold or other infection (fussy, tired, diarrhea or vomiting). While there is a blood test to see if an infant has blue baby syndrome, doctors may not think to do this test for babies with mild to moderate symptoms.

What should I do if my infant has blue baby syndrome?

Take a baby who has brownish-blue skin tone or a bluish color to the lips, tongue, gums, nail beds, or nose to a hospital immediately. A medication called "methylene blue" will quickly return the baby's blood to normal.

Washington State Department of Health
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HELPING TO ENSURE SAFE AND RELIABLE DRINKING WATER

Can I prevent blue baby syndrome?

Yes. Do not give infants younger than 12 months drinking water with nitrate levels above 10 mg/L. Do not offer high-nitrate vegetables such as beets, broccoli, carrots, cauliflower, green beans, spinach, and turnips until the baby is at least seven months old.

Nitrate levels in well water can vary throughout the year. If you have a private well and you're not sure about your water quality, you may want to use bottled water to prepare your baby's food and drinks. Although boiling water kills bacteria, it will not remove chemicals such as nitrate. In fact, boiling may actually increase the nitrate level.

Will breast-feeding give my infant blue baby syndrome?

Low levels of nitrate have been found in breast milk, but the levels are not high enough to cause blue baby syndrome.

Can nitrate affect adults?

Although red blood cells quickly return to normal, some health conditions can make people more susceptible to health problems from nitrate. Individuals with the following health conditions should not drink water with more than 10 mg/L of nitrate:

- Individuals who don't have enough stomach acids.
- Individuals with an inherited lack of the enzyme that converts affected red blood cells back to normal (methemoglobin reductase).
- Women who are pregnant or trying to become pregnant. High nitrate levels may increase the risk of spontaneous abortion or certain birth defects.

How can I tell if my well water has nitrate?

Shallow wells, poorly sealed or poorly constructed wells, and wells that draw from shallow aquifers are at greatest risk of nitrate contamination. Manure and septic tank waste may also contain disease-causing bacteria and viruses.

If you own a private well, we recommend that you test for coliform bacteria and nitrate every year. Your county health department can tell you where you can get your water tested and may have specific recommendations for testing. Many certified labs in Washington charge $20 to $40 per test. If your nitrate test results are 5 mg/L or higher, you may want to re-sample in six months.

Where can I get more information?

If you get your water from a public water system, call your water utility or the state Department of Health at (800) 521-0323. You can also visit online at http://www.doh.wa.gov/ehp/dw/

If you have a private well, call your local health department. You can also find information in *Private Wells: Information for owners* (331-249) a publication available in English and Spanish at https://fortress.wa.gov/doh/eh/dw/publications/publications.cfm

For a list of certified labs, visit the state Department of Ecology online at http://www.ecy.wa.gov/apps/eap/acclabs/labquery.asp Under "Location," select your state, city, and county. Scroll down and click on "Show results." Click on the name of a lab to see the tests it performs. Call the lab to make sure it's accredited to analyze for nitrate in drinking water.

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Revisado

Preguntas y Respuestas

Nitratos en el agua potable

El nitrato es un químico que se encuentra en la mayoría de los fertilizantes, estiércol, y residuos líquidos que se liberan de los tanques sépticos. Las bacterias naturales del suelo pueden convertir nitrógeno al nitrato. La lluvia o agua de irrigación puede llevar el nitrato a través del suelo hasta las aguas subterráneas. Su agua potable puede contener nitrato si su pozo saca agua de tales aguas subterráneas.

El nitrato es un contaminante que puede ocasionar enfermedades agudas, lo que significa que una sola exposición puede afectar a la salud de alguien.

¿Cómo afecta a la salud el nitrato?

El nitrato reduce la capacidad de los glóbulos rojos para llevar oxígeno. En la mayoría de los adultos y niños, estos glóbulos rojos se normalizan rápidamente. Sin embargo, en los lactantes, los glóbulos rojos pueden demorar más tiempo para normalizarse. Los lactantes que beben agua con altos niveles de nitrato (o comen alimentos hechos con agua contaminada con nitrato) pueden desarrollar una enfermedad seria debido a la falta de oxígeno. Esta enfermedad se llama metahemoglobinemia o "síndrome del bebé azul." Algunos científicos piensan que la diarrea puede empeorar este problema.

¿Está regulado por el estado el nitrato en el agua?

Sí. La ley estatal requiere que los sistemas de agua pública hagan pruebas para muchas contaminantes incluyendo el nitrato con regularidad. Nuestra norma para calidad del agua es 10 miligramos por litro (mg/L). Los sistemas de agua pública que contienen niveles de nitrato por encima de 10 mg/L deben notificar a las personas quien recibe agua de ellos.

Los niveles bajos de nitrato en el agua no tendrán un efecto de largo plazo en su bebé. Si su bebé no tiene ningunos de los signos del síndrome del bebé azul, no es necesario que su doctor le examine por la enfermedad de metahemoglobinemia.

¿Cuáles son los signos del síndrome del bebé azul?

El síndrome del bebé azul **moderado a serio** puede causar un tono de piel café-azulado dado la falta de oxígeno. Esta condición puede ser difícil de detectar en lactantes con piel oscura. Si un bebé tiene piel oscura, busca un color azulado dentro de la nariz y la boca, en los labios, o la piel debajo de las uñas de las manos o los pies.

El síndrome del bebé azul **suave a moderado** puede causar signos parecidos a un resfriado u otra infección (irritado, cansado, con diarrea o vómitos). Aunque existe una prueba de sangre para ver si un lactante tiene el síndrome del bebé azul, es posible que los médicos no hagan esta prueba para los bebés con síntomas suaves a moderados.

¿Qué debo hacer si mi bebé tiene el síndrome del bebé azul?

Lleve el bebé al hospital de inmediato si el tono de la piel tiene un color café-azulado o tiene un color azulado en los labios, la lengua, las encías, la piel debajo de las uñas y la nariz. Un medicamento llamado "azul de metileno" normalizará rápidamente la sangre del bebé.

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

HELPING TO ENSURE SAFE AND RELIABLE DRINKING WATER

¿Puedo prevenir el síndrome del bebé azul?

Si. No dé a los bebés menores de 12 meses de edad agua potable con niveles de nitrato más alto de 10 mg/L. No les dé verduras con alto contenido en nitrato como la remolacha, brócoli, zanahorias, coliflor, ejotes o judías, espinaca, y nabos hasta que el bebé tenga más de siete meses de edad.

Los niveles de nitrato en el agua de pozo pueden variar a través del año. Si usted tiene un pozo privado y no está seguro de la calidad del agua, es posible que desee usar agua en botella para preparar la comida y bebidas de su bebé. Aunque hervir el agua elimina las bacterias, no remueve químicos como el nitrato. De hecho, hirviendo causa la evaporación del agua que puede resultar en el incremento del nivel de nitrato.

¿Puede la lactancia materna ocasionar el síndrome del bebé azul?

Se ha encontrado bajos niveles de nitrato en la leche materna, pero los niveles no son bastantes altos para causar el "síndrome del bebé azul."

¿Puede el nitrato afectar a los adultos?

Aunque las células rojas vuelven rápidamente a la normalidad, las condiciones de salud de algunas personas las hacen más susceptible a los problemas de salud por nitrato. Las personas con las siguientes condiciones de salud no deberían beber agua con más de 10 mg/L de nitrato:

- Las personas que no tienen suficientes ácidos estomacales.
- Las personas con pérdida hereditaria de la enzima que convierte los glóbulos rojos afectados en células normales (metahemoglobina reductasa).
- Las mujeres embarazadas o que están tratando de quedar embarazadas. Alto contenido de nitratos puede incrementar el riesgo de aborto espontáneo o ciertos defectos de nacimiento.

¿Cómo puedo saber si mi agua de pozo tiene nitrato?

Los pozos poco profundos, mal sellados o construidos o los pozos que extraen agua de acuíferos poco profundos tienen riesgo más alto de tener agua contaminada con nitrato. El abono (estiércol) y los desechos de un tanque séptico pueden también contener bacterias y virus que causan enfermedades.

Si usted es el dueño de un pozo privado nosotros recomendamos que analice el agua por bacterias y nitrato cada año. El departamento de salud de su condado puede decirle donde puede obtener el análisis de su agua y pudiera tener recomendaciones específicas para el análisis. Muchos laboratorios certificados cobran entre $20 a $40 por análisis. Si el resultado del análisis de nitrato es de 5 mg/L o más alto, recomendamos que vuelva a hacer otro análisis en 6 meses.

¿Dónde puedo obtener más información?

Si usted obtiene agua de un sistema público, llame a su servicio de agua o al Departamento de Salud del Estado de Washington, Oficina de Agua Potable, al número de teléfono (800) 521-0323 o visítenos en línea en: http://www.doh.wa.gov/ehp/dw/

Si tiene un pozo privado, llame al departamento de salud local. También puede encontrar información en **Pozos Privados: Información para los propietarios (331-349s)** una publicación disponible en Inglés y Español https://fortress.wa.gov/doh/eh/dw/publications/publications.cfm

Para una lista de laboratorios certificados, visite en línea al Departamento de Ecología de Washington en: http://www.ecy.wa.gov/apps/cap/acclabs/labquery.asp. Bajo "Location" seleccione su estado, ciudad y condado. En la parte baja de la página haga click en "Show results." Haga click en el nombre de un laboratorio para ver qué tipo de análisis hace. Llame al laboratorio para asegurarse que esté acreditado para hacer análisis de nitrato.

Si usted necesita esta publicación en un formato diferente, llame al (800) 525-0127. Para TTY/TTD, llame al (800) 833-6388.

Appendix D

Health District Fax and EPA Letter

Yakima Health District
1210 Ahtanum Ridge Drive
Union Gap, Washington 98903
Phone (509) 575-4040
Fax (509) 575-7894

Date: December 29, 2010
To: Health Professionals
From: Gordon Kelly, Director of Environmental Health

Subject: Nitrate Treatment Program

Yakima County and the Yakima Health District are requesting your assistance. Next week we will be mailing information on a nitrate treatment program for private wells to Lower Valley residents. We are informing them that some private wells, especially shallow wells, may be contaminated with nitrates. We are asking that you help by informing your patients, who may be at risk, about the program.

Nitrate is a chemical that is colorless, odorless, and tasteless and found in some groundwater. Nitrate comes from nitrogen sources such as fertilizer, manure, failed septic system, and other nitrogen sources.

Although long term exposure to water high in nitrate is not harmful to healthy adults, drinking water from a well with high nitrate levels may be harmful for infants younger than 12 months, pregnant women, and people with a rare blood disorder. For the at risk population defined above, drinking water with a nitrate level higher than 10 parts per million, may lead to *methemoglobinemia* (baby blue syndrome).

For questions or more information:

- Testing nitrate, call Yakima County Nitrate Treatment Program Hotline at (855) 740-8429.
- Nitrate health effects call Yakima Health District at (800) 535-5016 or (509) 249-6507.
- The website for the Yakima County Nitrate Treatment program: www.yakimacounty.us/nitrateprogram.

We ask that you please encourage your patients, who may be at risk to high nitrates, to contact the Yakima County Nitrate Treatment Program or Yakima Health District. This is especially important if you know they get their drinking water from a private well.

Thank you for your help.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

December 28, 2010

Dear EPA Well Water Participant,

This year, the State of Washington awarded a grant to Yakima County to develop a treatment program for households with people at high public health risk from nitrate contamination. The county is using this grant to make treatment devices accessible to a limited number of households with high nitrate levels in their drinking water.

In the next week or so, you will receive a letter from Yakima County about this program. The mailing will explain the program, who is eligible, and how to apply.

If you apply, you will need to provide drinking water sample results from your property. These results must show that nitrate levels in your water are greater than EPA's drinking water standard of 10 parts per million, as determined and documented by a certified testing laboratory.

Enclosed are results from the nitrate sampling we conducted on your property in 2010. If you are eligible for the County's program and decide to apply, you will need to provide a copy of this letter as part of your application. The County will accept it as documentation that your well exceeds the drinking water standard for nitrate.

If you have any questions about your sample results, please contact me: Caryn Sengupta, 206-553-1275 or sengupta.caryn@epa.gov

Sincerely,

Caryn Sengupta

December 28, 2010

Estimado Participante del EPA Usando Una Noria:

Este año, el estado de Washington distribuyo un subsidio del gobierno al el condado de Yakima para desarrollar un programa de tratamiento para los hogares con personas que pueden tener alto riesgo de salud de la contaminación Nitratos. El condado de Yakima está usando el subsidio para dar los dispositivos de tratamiento a un número de hogares con altos niveles de nitratos en el agua potable.

En la próxima semana, usted recibirá una carta del condado de Yakima sobre este programa. La carta le explicará el programa, quién es elegible y cómo aplicar.

Si usted aplica, Usted tendrá que tomar muestras del agua potable en su propiedad y Usted tendrá que proporcionarnos las muestras. Estos resultados deben demostrar que los niveles del Nitrato en su agua son más alto que el estándar del agua potable de EPA de 10 porciones por millón, como determinado y documentado por un laboratorio certificado en tomar pruebas.

Incluido estan los resultados de la muestra de Nitrato que condujimos en su propiedad en 2010. Si Usted es eligible para el programa del condado y decide aplicar, necesitará proveír una copia de esta carta como parte de su aplicación. El condado lo aceptará como documentación que su noria sobrepasa el nivel de Nitratos en su agua potable.

Si Usted tiene qualquier pregunta acerca de los resultados de la muestra, por favor póngase en contacto conmigo: Caryn Sengupta, 206-553-1275 o sengupta.caryn @ epa.gov. Si prefiere hablar con alguien en Español, por favor póngase en contacto con Michael Ortiz al número 206-553-6234 o Ortiz.michael@epa.gov.

Sinceramente,

Caryn Sengupta

Appendix E

New Releases

Public Services

128 North Second Street • Fourth Floor Courthouse • Yakima, Washington 98901
(509) 574-2300 • 1-800-572-7354 • FAX (509) 574-2301 • www.co.yakima.wa.us

VERN M. REDIFER, P.E. - Director

YAKIMA COUNTY LAUNCHES NITRATE TREATMENT PILOT PROGRAM

News Conference Scheduled

FOR IMMEDIATE RELEASE: MONDAY, JANUARY 3, 2011

CONTACT: Lisa Freund, Yakima County Public Services Administrative Supervisor
Office: 509-574-2300
Cell: 509-961-0470

Yakima, WA – Yakima County will unveil the Nitrate Treatment Pilot Program, a treatment program aimed at households with people at high public health risk from nitrate contamination, at a news conference on Tuesday.

15th District State Senator Jim Honeyford will join Yakima County Commissioners, County staff, representatives from the EPA, the Yakima Health District, State Department of Health, Culligan International and other partners to explain the program, which will offer nitrate treatment options to lower Valley households served by private wells that have tested high for nitrates.

According to County officials, the treatment program is the first step in a larger effort to address groundwater contamination in the Lower Valley.

The media and public are invited to attend:

Tuesday, January 4, 2011
12:00 PM (noon)
Sunnyside Community Center
1521 S. 1st St. in Sunnyside

Directions from Yakima
Driving time **approx 40 min:**

- Take I-82 eastbound to exit 67 (Sunnyside/Mabton exit)
- Turn left (north) onto S. 1st St.
- Proceed north through first stoplight (S. Hill Rd.)
- Turn left (west) into South Hill Park
- Sunnyside Community Center is on the left

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COMMITMENT • SERVICE • EXCELLENCE
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Public Services

128 North Second Street • Fourth Floor Courthouse • Yakima, Washington 98901
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VERN M. REDIFER, P.E. - Director

NITRATE TREATMENT PILOT PROGRAM
Information & Application Assistance
Public Meetings This Week

FOR IMMEDIATE RELEASE: TUESDAY, JANUARY 11, 2011

CONTACT: Lisa Freund, Yakima County Public Services Administrative Supervisor
Office: 509-574-2300
Cell: 509-961-0470

Yakima, WA – Lower Valley residents who are served by private wells and all persons interested in Yakima County's Nitrate Treatment Program will have two opportunities this week to learn more about the program, find out about financial assistance options, and to obtain application assistance.

Program representatives from Yakima County, the Department of Health, U.S. Environmental Protection Agency, the Yakima Health District and Culligan International will be available to share nitrate-related health information and to discuss nitrate treatment options to Lower Valley households served by private wells that have tested high for nitrate.

The public meetings follow last week's 8000-piece mailing that was sent to Lower Valley residents served by private wells.

Residents who received a packet and plan to apply are urged to bring their packet to the meeting.

Both meetings begin at 6:00 PM.

MABTON
Wednesday, January 12, 2011
Artz-Fox Elementary School - Gymnasium
805 Washington St.
Mabton, WA

Directions from Yakima:

- **I-82 E** toward **Richland** (33.4 mi)
- Take **Exit 67** toward **Sunnyside Mabton** (0.3 mi)
- Turn right at **Midvale Rd** (0.2mi)
- Take the first left onto **Alexander Rd** (1.0mi)

- Take the 2nd right onto **WA-241 S/Sunnyside Mabton Rd** (6.0mi)
- Turn left at **Washington St** (0.4mi)
- Turn left at **7th Av** (413 ft)
- School is on the left.

SUNNYSIDE
Thursday, January 13, 2011
Denny Blaine Board Room
Denny Blaine Bldg – (Migrant Student Data Recruitment)
810 E. Custer Ave.
Sunnyside, WA

Directions from Yakima:

- Take I-82 eastbound to exit 63 (Yakima Valley Highway);
- Proceed south into Sunnyside.
- Continue through two stop lights and turn right at the Snipes Mt. Brewery onto 8th.
- Continue one block, turn right on East Custer Ave.

A third public meeting will follow next Wednesday, January 19, in Toppenish at the Toppenish High School cafeteria.

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Public Services

128 North Second Street • Fourth Floor Courthouse • Yakima, Washington 98901
(509) 574-2300 • 1-800-572-7354 • FAX (509) 574-2301 • *www.co.yakima.wa.us*

VERN M. REDIFER, P.E. - Director

NITRATE TREATMENT PILOT PROGRAM UPDATE

Installation of Filtration Systems Underway

FOR IMMEDIATE RELEASE: WEDNESDAY, FEBRUARY 23, 2011

CONTACT: Lisa Freund, Yakima County Public Services Administrative Supervisor
Office: 509-574-2300
Cell: 509-961-0470

Yakima, WA –Installation of free filtration systems begins this week in nearly 50 Lower Valley homes served by private wells that have tested high for nitrate. The filtration systems are made possible by Yakima County's Nitrate Treatment Pilot Program, a state-funded program initiated in response to concern about nitrate contamination in groundwater.

In January approximately 8000 packets were delivered to homeowners and residents in the Lower Valley who are served by private wells, inviting them to test for nitrate levels in their water. If the packet's in-home test indicated nitrate levels of 10 milligrams per liter or above, residents were encouraged to apply for a filtration system to treat their drinking water for nitrate.

To date, 106 of the nearly 1500 in-home test results returned have indicated nitrate levels at 10 mg per liter or above. The County is encouraging homeowners and residents whose water tested at those levels to return a completed application and certified lab results as soon as possible. Those homeowners and residents who've not yet conducted the in-home test are encouraged do so and return their results to the County.

According to County officials, funding is limited to 300 free systems. To be considered, the resident or the homeowner must submit certified lab results showing that the nitrate level in the water is equal to or greater than 10 mg per liter. A completed, owner-signed application is also required.

Applications are being accepted on a first-come first-served basis until Friday, April 29, 2011. For more information, please call the Nitrate Treatment Hotline at 855-740-8429 or visit the nitrate website at http://www.yakimacounty.us/nitrateprogram.

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Public Services

128 North Second Street • Fourth Floor Courthouse • Yakima, Washington 98901
(509) 574-2300 • 1-800-572-7354 • FAX (509) 574-2301 • *www.co.yakima.wa.us*

VERN M. REDIFER, P.E. - Director

NITRATE TREATMENT PILOT PROGRAM
Application Deadline Extended to May 31

FOR IMMEDIATE RELEASE: FRIDAY, MAY 6, 2011

CONTACT: Lisa Freund, Yakima County Public Services Administrative Supervisor
Office: 509-574-2300
Cell: 509-961-0470

Yakima, WA – If you live in the Lower Yakima Valley and are served by a private well that has tested high in nitrate, there is still time to submit an application for a free water treatment system through Yakima County's Nitrate Treatment Pilot Program.

According to Yakima County officials, funding is still available for approximately 200 point-of-use filtration systems that will help reduce nitrate in drinking water to federally accepted standards. To date, 110 households have met the eligibility criteria for a free system; funding is available for approximately 300 free systems.

The treatment program, aimed at households with people at high public health risk from nitrate contamination, is made possible through 2010 state legislative funding. All program funds must be expended by June 30, 2011.

As part of the application process, the Environmental Protection Agency (EPA) is offering free certified lab testing for households on private wells in the program area. The certified lab test, indicating nitrate levels at 10 mg per liter or above, is required in addition to a completed application.

Applications and certified lab results must be submitted by Tuesday, May 31, 2011 to Yakima County Public Services, Courthouse Fourth Floor, 128 N. 2nd St., Yakima, WA 98901.

To request an application packet or for more information, please call the Nitrate Treatment Pilot Program Hotline at 1-855-740-8429 or visit the website at:
http://www.yakimacounty.us/nitrateprogram/english/default.htm.

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Appendix F

Last Chance Postcard, Flyers and Distribution Sites

Last Chance!

for your Free Water Filtration System...

The Deadline to Apply for a Free Water Filtration System Is Fast Approaching. Don't Be Left out! Apply Now!

3 easy steps

- Test your water with your packet's test strip
- If the nitrate level is at or above 10 mg per liter, get a certified lab test
- Return your completed application and lab results to Yakima County

Need a new packet?
Want assistance with your certified lab test?

Call the Nitrate Hotline at 855-740-8429

or go online @
www.yakimacounty.us/nitrateprogram

¡Última Oportunidad!

para obtener su sistema de filtración gratis

La fecha límite para solicitar un sistema de filtración de agua gratis se aproxima. ¡No pierda la oportunidad!

3 pasos simples

- Haga la prueba a su agua con la tira de prueba de su paquete.
- Si el nivel de nitrato es mayor a 10 mg por litro, obtenga una prueba de un laboratorio certificado
- Regrese la solicitud completa

¿Necesita otro paquete?
¿Necesita ayuda para la prueba del laboratorio certificado?

Llame a la línea directa 855-740-8429

o vaya al sitio en el Internet
www.yakimacounty.us/nitrateprogram

NITRATE TREATMENT PILOT PROGRAM

128 N. 2nd Street, Fourth Floor
Yakima, WA 98901

Time is running out!

Free filtration systems won't last long...

NITRATE TREATMENT PILOT PROGRAM

Yakima County Public Services ■ 128 N. 2nd Street, Fourth Floor - Yakima, WA 98901 ■ NITRATE HOTLINE: 855-740-8429

Attention LOWER VALLEY Residents!

Do you think you have high Nitrates in your water?

For a LIMITED TIME ONLY you may be eligible for a FREE WATER TREATMENT SYSTEM through Yakima County. This installation will reduce the nitrate levels in your drinking water to accepted federal standards.

What are Nitrates?

Nitrate is a chemical found in fertilizers, manure and septic tank liquids. Rain or irrigation water can carry nitrate down through the soil into groundwater. Your drinking water may contain nitrate if your well draws from this groundwater.

Do You Qualify?

- ✓ Do you live in the Lower Valley?
- ✓ Do you get your drinking water from a private well?
- ✓ Are the Nitrates in your water at 10mg per liter or higher?

OFFER EXTENDED THROUGH MAY!

Call our Nitrate Hotline to apply today! **855.740.8429**

NITRATE TREATMENT PILOT PROGRAM

Yakima County Public Services ■ 128 N. 2nd Street, Fourth Floor - Yakima, WA 98901 ■ NITRATE HOTLINE: 855-740-8429

Attención residentes del

VALLE BAJO!

¿Piensa que su agua tiene un alto nivel de nitrato?

SÓLO POR TIEMPO LIMITADO usted puede ser elegible para obtener UN SISTEMA DE TRATAMIENTO DE AGUA GRATIS a través del Condado de Yakima. Este sistema reducirá el nivel de nitrato en su agua para tomar a los estándares federales aceptables.

¿Qué es el Nitrato?

El nitrato es un químico que se encuentra en fertilizantes, estiércol y en los líquidos de las fosas sépticas. La lluvia y el agua de riego acarrean el nitrato de la tierra al agua subterránea.

¿Califica usted para este programa?

- ✓ ¿Vive usted en el Valle Bajo de Yakima?
- ✓ ¿Su agua de tomar es de un pozo privado?
- ✓ ¿El nivel de nitrato en su agua es mayor de 10 mg por litro?

¡La fecha límite de este programa se ha extendido hasta Mayo!

¡Llame a la línea abierta y solicite ahora!

855.740.8429

Nitrate Treatment Pilot Program
Community Outreach Poster & Flyer Distribution

In addition to distributing approximately 380 flyers door-to-door in the target area, Culligan International also delivered program materials to these Lower Valley businesses and organizations:

AB Foods (Washington Beef), Toppenish
Ag Health Laboratories, Inc., Sunnyside
All Tribes Christian Church, Wapato
Bethany Presbyterian Church, Grandview
Blue Sky Market, Mabton
Farmers Insurance, Union Gap
Fiesta Foods, Sunnyside
Iglesia el Calvario, Sunnyside
Iglesia de Valle, Toppenish
Liberty Community Church, Granger
Outlook Elementary School, Outlook
Radio KDNA, Granger
St Joseph Church, Sunnyside
Sunnyside Free Methodist Church, Sunnyside
Toppenish Community Food Bank, Toppenish
Trinity Reformed Church, Sunnyside
Valley Environmental Laboratory, Yakima
Valley Fruit, Wapato
Yakima Valley Farmworkers Clinic, Toppenish
Zillah Civic Center, Zillah

Appendix G

Second Deadline Extension Flyers

NITRATE TREATMENT PILOT PROGRAM

Yakima County Public Services ■ 128 N. 2nd Street, Fourth Floor - Yakima, WA 98901 ■ NITRATE HOTLINE: 855-740-8429

Attention LOWER VALLEY Residents!

Do you think you have high Nitrates in your water?

For a LIMITED TIME ONLY you may be eligible for a FREE WATER TREATMENT SYSTEM through Yakima County. This installation will reduce the nitrate levels in your drinking water to accepted federal standards.

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Nitrate is a chemical found in fertilizers, manure and septic tank liquids. Rain or irrigation water can carry nitrate down through the soil into groundwater. Your drinking water may contain nitrate if your well draws from this groundwater.

Do You Qualify?

- ✓ Do you live in the Lower Valley?
- ✓ Do you get your drinking water from a private well?
- ✓ Are the Nitrates in your water at 10mg per liter or higher?

OFFER EXTENDED THROUGH MAY!

Call our Nitrate Hotline to apply today! **855.740.8429**

NITRATE TREATMENT PILOT PROGRAM

Yakima County Public Services ■ 128 N. 2nd Street, Fourth Floor - Yakima, WA 98901 ■ NITRATE HOTLINE: 855-740-8429

Attención residentes del VALLE BAJO!

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SÓLO POR TIEMPO LIMITADO usted puede ser elegible para obtener UN SISTEMA DE TRATAMIENTO DE AGUA GRATIS a través del Condado de Yakima. Este sistema reducirá el nivel de nitrato en su agua para tomar a los estándares federales aceptables.

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¿Califica usted para este programa?

- ✓ ¿Vive usted en el Valle Bajo de Yakima?
- ✓ ¿Su agua de tomar es de un pozo privado?
- ✓ ¿El nivel de nitrato en su agua es mayor de 10 mg por litro?

¡La fecha límite de este programa se ha extendido hasta Mayo!

¡Llame a la línea abierta y solicite ahora!

855.740.8429

Appendix H

Culligan Brochure

Culligan Aqua-Cleer®
Advanced Drinking Water System

Culligan Aqua-Cleer® Advanced Drinking Water System is the solution to...

Provide you with:

- Great tasting water
- Water filters for numerous contaminants and impurities
- No more foul odors
- An economical alternative to bottled water

Treat your own water conditions:

- Water analysis determines your water needs
- Filter for numerous water problem
- System tailored to meet your needs
- Ability to serve more than one tap

Help the environment:

- Fewer plastic bottles in landfills
- Less fuel used to manufacture plastic bottles
- Less fuel used to obtain water
- Reduces greenhouse gas emissions

GREEN SOLUTIONS™

Culligan®

better water. pure and simple.™

Product Specifications

Sediment Filters. Screens out sediments and particles. Various micron size filters are available.

Carbon Filters. Reduces elements that cause water to taste and smell unpleasant, including the taste and odor of chlorine.

Reverse Osmosis Filters. Reduces dissolved substances such as radium, lead, arsenic V, and many others.* Various capacity membranes are available.

Specialty Filters. Reduces substances** such as perchlorate, VOC***, MTBE, mercury and arsenic III. A range of specialty filters are available.

Post Carbon Filter. A second carbon filter ensures your drinking water is clean and fresh.

* Consult the Performance Data Sheet for the specific contaminant reduction capabilities of this device.
** Substances are not necessarily in your water.
*** VOC is a broad term used to describe many chemicals and compounds that are known carcinagens.

Manifold Assembly. The patented single manifold ensures reliability. Houses four separate filter technologies in a unique space saving design. The manifold is molded using AlphaSan® antimicrobial resin.

Automatic Shutoff Valve. Shuts off the system when reservoir tank is full.

Quality Monitor. (not shown) State-of-the-art electronics automatically monitors the water quality.

Reservoir Tank. Durable, high quality steel tank ensures you'll have a plentiful supply of refreshing water. Various size tanks are available.

Designer Faucet. Multiple styles and colors are available. An optional monitor light on the base indicates time to change filters.

Why Millions Trust Culligan To Deliver Better Water

- Culligan holds over 200 patents in water treatment world wide.
- Culligan products possess the industry's most state-of-the-art features thanks to our in-house research & development facility and accredited analytical lab.
- Our products are backed by the best service technicians in the industry. With over 900 dealers worldwide, a Culligan Man® is never more than a phone call away.
- We have the expertise to correctly identify the perfect water treatment system. Your local dealer is a trained water specialist with Culligan expertise.
- We sell and service our products in more than 100 countries globally. Wherever you may move, we'll be there to make sure you receive the quality Culligan water you have come to enjoy.

HEY CULLIGAN MAN®! Your Culligan Man is your hometown professional with over 70 years in the business, over 900 dealers and the best service technicians. A Culligan Man is just a phone call away.

Culligan.

better water. pure and simple.™

www.culligan.com
1-800-CULLIGAN

Moore Wallace Part No. 37156
Printed 3/08

ANTIMICROBIAL AlphaSan®

NSF

Good Housekeeping Promises

CAUTION: Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system. The contaminants or other substances removed or reduced by this water treatment device are not necessarily in your water.

Culligan's Aqua-Cleer® Water Filters have been certified by NSF International which assures your Culligan Filter has been tested under the highest of industry standards.

The Good Housekeeping Seal applies to drinking water systems, softeners and whole-house filters. Warranties available separately. See written warranties for applicable terms and conditions.

Dealers are independently owned and operated.