



Public Services

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VERN M. REDIFER, P.E., Director

April 27, 2016

David Bowen
Department of Ecology, Central Region Office
1250 West Alder Street
Union Gap, WA 98903

Re: **Lower Yakima Valley GWMA - 2016 First-Quarter Report (IAA No. C 1200235)**

Dear David:

Enclosed please find one (1) copy of Yakima County's first-quarter report as required under Attachment A, Statement of Work, Agreement No. C 1200235 between the State of Washington Department of Ecology and Yakima County.

This report addresses deliverables 1.1, 1.4 and 2.2 as required under the agreement.

Deliverable 2.1, invoices, to be sent under separate cover.

If you have any questions, please let me know.

Thank you.

Lisa H. Freund, Administrative Manager
Yakima County Public Services

enclosure

Yakima County ensures full compliance with Title VI of the Civil Rights Act of 1964 by prohibiting discrimination against any person on the basis of race, color, national origin, or sex in the provision of benefits and services resulting from its federally assisted programs and activities. For questions regarding Yakima County's Title VI Program, you may contact the Title VI Coordinator at 509-574-2300.

If this letter pertains to a meeting and you need special accommodations, please call us at 509-574-2300 by 10:00 a.m. three days prior to the meeting. For TDD users, please use the State's toll free relay service 1-800-833-6388 and ask the operator to dial 509-574-2300.

**IAA No. C 1200235 – First Quarter 2016 Report
Lower Yakima Valley GWMA
March 31, 2016**

**TASK 1 - ADMINISTRATIVE FUNCTIONS
DELIVERABLES**

1.1 Meeting Records

For each meeting of the GWAC, submit a copy of the agenda, minutes, attendance and public meeting notice at the end of each quarter.

Attachment [A] includes the final GWAC meeting summary of October 15, 2015; the draft GWAC meeting summary of February 18, 2016; the Education and Public Outreach (EPO) Working Group summaries of January 6, February 3, and March 2, 2016; the Irrigated Ag Working Group (IAWG) summary February 10, 2016; the Residential, Commercial, Industrial, and Municipal (RCIM) Working Group summaries of January 28 and March 24, 2016; the Data Collection, Characterization and Monitoring Working Group summaries of January 14 and March 9, 2016; and the Regulatory Framework Working Group summaries of January 13, February 17, and March 9, 2016. The Livestock/CAFO and Funding Working Groups did not hold meetings in the first quarter.

1.4 2016 Meeting Schedule

At its February meeting, the GWAC agreed to continue its bimonthly meeting schedule. Meetings will be held the third Thursday of the month from 5:00 p.m. - 7:00 p.m. at the Denny Blaine Boardroom, 810 East Custer Avenue in Sunnyside whenever possible. When that venue is not available, meetings will be held at Radio KDNA, 121 Sunnyside Avenue in Granger. Meeting dates for 2016 are February 18, April 21, June 16, August 18, October 20, and December 15 (as needed).

**TASK 2 - PROGRAM FUNCTIONS
DELIVERABLES**

2.2 Status Report

Submit written quarterly status reports summarizing GWAC plans, activities and work products, and describing any interlocal agreements or other contracts by the end of each quarter.

The GWAC held its first 2016 meeting on February 18.

Membership Update. David Bowen replaced Charlie McKinney as the Department of Ecology's primary member. Charlie retired February 29. Ron Cowin was named primary member for the Sunnyside-Roza Joint Board of Control following Jim Trull's death in January. An alternate has not been named.

Work Plans and Products

Deep Soil Sampling. The fourth round of deep soil sampling will be initiated shortly. Data procured in the first three rounds (from the 141 fields sampled in 2014 and 2015) were assembled and shared with the GWAC. The project remains within budget.

Deep Soil Sampling Combined Report - Fall 2015 is included as Attachment [B]

Nitrogen Loading Assessment. The Nitrogen Loading Assessment is designed to provide the relative nitrogen loading from all sources in the Lower Yakima Valley. This assessment has been divided into three components:

- Livestock (lagoons, settling ponds, pens and corrals)
- Irrigated Agricultural areas
- RCIM (on-site sewage systems, municipalities, industrial facilities, atmospheric deposition, etc.)

The current challenge is to make sure all three evaluations use similar methodology (approach, evaluation, and assumptions). The goal is to have one seamless document that is scientifically sound, neutral, reproducible, transparent, and that will be useful to the GWAC to make future decisions about actions in the Lower Yakima Valley.

The process includes:

- Peer review
- Committee review
- GWAC review

Status: Peer review has been completed on the Livestock/CAFO component. The Irrigated AG and RCIM component have been completed and are under peer review.

Ambient Groundwater Monitoring Network. Pacific Groundwater Group (PGG) has a contract with Yakima County to design an ambient groundwater monitoring system. The GWAC approved (2/19/15) the ambient monitoring network. This decision was based on two documents produced by PGG:

- Potential Groundwater Monitoring Stations, Yakima Groundwater Management Area (12/3/2013)
- Interim Final Groundwater Monitoring Plan, Lower Yakima Valley GWMA, Initial Characterization (8/15/14)

On March 18 Pacific Groundwater Group (PGG) issued the "Draft Ambient Groundwater Monitoring Network Location Selection Method" Technical Memorandum for working group review. Discussion is currently taking place within the Data group. Subsequent memoranda are in process.

The next deliverable will have more specifics on each well site (approximately six weeks). The goal is to develop an ambient groundwater monitoring network that supports the GWAC's goal of monitoring the progress of groundwater quality. This goal is different than looking at groundwater trends, identifying hot-spots, or determining sources of contamination. One monitoring program cannot adequately address all these issues. An ambient monitoring network will be the tool that will characterize the state of groundwater in the Lower Yakima

Valley and will address the goal of the GWAC. Other efforts (described in the above documents) can be built off of the ambient monitoring network.

PGG Technical Memorandum "Draft Ambient Groundwater Monitoring Network Location Selection Method," dated March 18, 2016 is included as Attachment [B]

High Risk Well Assessment Survey Phase II. Between September 2015 and the program's closure on March 31, 2016, the Yakima Health District completed 290 sampling surveys—90 surveys above the EPO's original target of 200. Interest in Phase II far exceeded interest shown in Phase I (2013-14), which was attributed to heightened public awareness of the GWMA and its work, extensive media coverage, and outreach conducted by individual EPO members.

In January and February 2016 the EPO conducted a second wave of outreach similar to the initial outreach conducted in September-October 2015. Approximately 350 direct mail invitations were mailed to households in the GWMA and a companion news release was issued to local media reminding residents of the February 29 deadline. Following this outreach, requests surged. At the end of January over 200 households had expressed interest in participating. Accordingly, a contract amendment was executed on February 16 extending the deadline to March 31 and increasing the contract amount from \$50,000 to \$70,000 and increasing the number of surveys from 200 to 280.

At the end of March, 290 households had either been tested or had expressed interest in participating. A second amendment was initiated to ensure that all households who contacted the health district before March 31 would be allowed to participate.

Preliminary well assessment survey test results were shared with the GWAC in February.

Although two amendments were ultimately approved, the program remained under the GWAC-approved budget of \$100,000.

Participant Follow-up: In January the County sent 115 results letters to 2015 participants with their certified lab results and educational materials. Follow-up letters continued to be issued monthly as results were received from the Yakima Health District. As of this writing, 175 of the 290 participants have received a results letter with educational materials. A summary of the survey results is expected to be completed in June, following data has been verification.

A household invitation letter, news releases dated January 25 and March 1, a sample results letter with enclosures, and preliminary well assessment survey test results are included as Attachment [C]

Amendment No.1 to the Yakima Health District agreement is included as Attachment [D]

Working Group Activities

Education and Public Outreach (Lisa Freund, Chair)

The EPO met on January 6, February 3, and March 2. The group identified the remaining tasks associated with its four GWAC-funded projects: creating and maintaining a new GWMA website, conducting the High Risk Well Assessment Phase II, the Education and Outreach Campaign, and conducting additional outreach surveys. The group agreed to move forward with an online survey but to table door-to-door surveys until the GWAC has produced products and/or recommendations to share with the public. Meetings focused on the four goals as follows:

Well Assessment Phase II: The County will begin sending results letters to the participants in monthly batches. To garner more participation, 350 letters will be sent out to households in the GWMA inviting participation. A companion news release will be issued. The group agreed that if funds remained after the surveys were completed, they would identify a 2016 well assessment strategy.

Civic Plus Website: at the February meeting the group reviewed the GWMA public online survey and introductory language. The survey, a duplicate of the door-to-door survey conducted in 2013 by Heritage University students, was subsequently uploaded to the web in Spanish and English.

Prevention Campaign 2015: Gretchen Stewart provided an update on the *ad hoc* committee's work. A traveling dual language exhibit booth concept has been explored. The committee has also considered requesting an allocation to hire a marketing firm to develop a strategy and materials for the prevention campaign. The larger group agreed that they need more information before reaching a decision and making a recommendation to the GWAC.

In March the group discussed the traveling booth and agreed that they needed to determine if volunteers would be willing to man the booth before making a final decision. A community events list of was subsequently prepared and distributed to the EPO to solicit volunteers.

Data Collection (Melanie Redding, Chair) The Data Collection working group met on January 14 and March 9. At the January meeting, Pacific Groundwater Group (PGG) representatives Pony Ellingson and Steve Swope reported on progress relative to designing the Ambient Groundwater Monitoring Program. A preliminary report was anticipated in one to two months. Melanie Redding provide an update on the Nitrogen Loading Assessment, advising that peer reviewers had held several meetings to go over the Livestock/CAFO data and loading assessment. The Irrigated AG (IAWG) and RCIM reports were anticipated to be completed in February. A discussion ensued regarding Atmospheric Deposition; the group agreed that the topic should be addressed separately from the three already in process and would be contained in the RCIM piece.

At the March meeting Melanie reported that the peer review committee had finished their review of the Nitrogen Loading Assessment report on livestock. The IAWG piece, meanwhile, had been sent to the peer review committee for review. The RCIM report from the County had not yet been issued. A timeframe for the completion of the draft reports was not available at that time.

The group also discussed the area characterization, atmospheric deposition and the ambient monitoring network. An update on the latter was expected possibly at the next meeting.

Irrigated Ag (IAWG) (Troy Peters, Chair)

The group met on February 10. The members stopped regular proceedings to pay tribute to Jim Trull, who had died in January. Troy Peters was chosen to succeed him as chair. The group reviewed the fall 2015 deep soil sampling results taken from 60 different sites. The Washington State Department of Agriculture (WSDA) then made a presentation on the Nitrogen Loading Assessment. Discussion followed.

Residential, Commercial, Industrial, and Municipal (RCIM) (Ryan Ibach, Chair)

The group met on January 28 and March 24. At the January meeting Bob Farrell formally stepped down as chair due to work demands at the Port of Sunnyside. Ryan Ibach, Yakima Health District, was chosen to succeed Bob as chair. The group reviewed the GWMA acreage considered to be devoted to hobby farms (2757 acres, or 1.6% of total acreage), nitrogen loading from large septic systems, and draft modifications to the Deep Soil Sampling Plan for use in RCIM sites. The latter was tabled pending further information from the County.

At the March meeting the group reviewed and discussed the GWMA septic system map produced by Yakima County GIS at RCIM's request. Yakima Health District staff made a presentation and answered questions about the operation of septic systems. Discussion followed regarding another presentation from the Yakima Health District on Natural Selection Farms, and/or deep soil sampling on bio-solids fields.

Regulatory Framework (Jean Mendoza, Chair)

The Regulatory Framework working group met on January 13, February 17 and March 9. At the January meeting Chair Jean Mendoza guided the group through a discussion regarding members' goals, the group's GWMA-specific goals and how to obtain those goals. The group agreed to a list of items for further review: chemigation, fertigation, mining, irrigation, atmospheric deposition, large, on-site septic systems, energy tax credits and technology.

In February Charlie McKinney, Department of Ecology, gave presentations on surface mining, wastewater applications, and atmospheric deposition. Jean presented the group with a document entitled "Proposed Roadmap for the GWMA Regulatory Workgroup"; discussion ensued. The group expressed concern that the document moved them away from its original plan. They reached consensus to stay the course with the work plan as defined in WAC 173-100-100 sections 3.1, 3.2 and 3.3. They further agreed not to adopt the "Proposed Roadmap" document as presented.

At the March meeting the group heard presentations by Ron Cowin, SVID, on rules and regulations that apply to irrigation districts) and by Phil Rigdon, Yakama Nation, on laws and policies from a Yakama Nation perspective.

GWMA Website

The GWMA website continued to be updated in real time.

Contracts and Interlocal Agreements

Amendment No. 1 - Agreement between the Yakima Health District and Yakima County (BOCC39-2016) was signed on February 16, 2016. The amendment increased the number of surveys to be conducted (from 200 to 280), increased the contract amount (from a maximum of \$50,000 to \$70,000) and extended the contract deadline from February 29 to March 31, 2016.

The amendment is included as Attachment [D]

Attachment A

- Final GWAC meeting summary of October 15, 2015.
- Draft GWAC meeting summary of February 18, 2016.
- GWAC agenda, attendance roster record and public meeting notice for February 18, 2016.
- Education and Public Outreach (EPO) Working Group summaries of January 6, February 3 and March 2, 2016.
- Irrigated Ag Working Group (IAWG) summary of February 10, 2016.
- Data Collection, Characterization and Monitoring Working Group summaries of January 14 and March 9, 2016.
- Regulatory Framework Working Group summaries of January 13, February 17 and March 9, 2016.
- Residential, Commercial, Industrial and Municipal (RCIM) Working Group summaries of January 28 and March 24, 2016.
- The Livestock/CAFO and Funding Working Groups did not hold meetings in the fourth quarter.

YAKIMA VALLEY GROUNDWATER MANAGEMENT AREA ADVISORY COMMITTEE (GWAC)

MEETING SUMMARY

Thursday, October 15, 2015 – 5:00 p.m. – 7:00 p.m.

Denny Blaine Boardroom
810 East Custer Ave., Sunnyside, WA

Note: This document is only a summary of issues and actions of this meeting. It is not intended to be a transcription of the meeting, but an overview of points raised and responses from Yakima County and Groundwater Advisory Committee members. It may not fully represent the ideas discussed or opinions given. Examination of this document cannot equal or replace attendance.

I. Call to Order

Roll Call: The meeting was called to order at 5:00 p.m. by Jim Davenport, Facilitator.

Member	Seat	Present	Absent
Stuart Turner	Agronomist, Turner and Co.,	✓	
Chelsea Durfey			✓
Bud Rogers	Lower Valley Community Representative Position 1	✓	
Kathleen Rogers	Lower Valley Community Representative Position 1 (alternate)	✓	
Patricia Newhouse	Lower Valley Community Representative Position 2	✓	
Sue Wedam	Lower Valley Community Representative Position 2 (alternate)	✓	
Doug Simpson	Irrigated Crop Producer	✓	
Jean Mendoza	Friends of Toppenish Creek	✓	
Eric Anderson	Friends of Toppenish Creek (alternate)		✓
Jan Whitefoot	Concerned Citizens of the Yakama Reservation		✓
Jim Dyjak	Concerned Citizens of the Yakama Reservation (alternate)		✓
Steve George	Yakima County Farm Bureau	✓	
Frank Lyall	Yakima County Farm Bureau (alternate)		✓
Jason Sheehan	Yakima Dairy Federation	✓	
Dan DeGroot	Yakima Dairy Federation (alternate)	✓	

Jim Trull	Roza-Sunnyside Joint Board of Control	✓	
Ron Cowin	Roza-Sunnyside Joint Board of Control (alternate)		✓
Laurie Crowe	South Yakima Conservation District		✓
Jim Newhouse	South Yakima Conservation District (alternate)		✓
Robert Farrell	Port of Sunnyside	✓	
John Van Wingerden	Port of Sunnyside (alternate)		✓
Rand Elliott	Yakima County Board of Commissioners	✓	
Vern Redifer	Yakima County Board of Commissioners (alternate)	✓	
Ryan Ibach	Yakima Health District		✓
Dr. Troy Peters	WSU Irrigated Agriculture Research and Extension Center		✓
Lucy Edmondson	U.S. Environmental Protection Agency	✓	
Marie Jennings	U.S. Environmental Protection Agency (alternate)		✓
Elizabeth Sanchey	Yakama Nation		✓
Tom Ring	Yakama Nation (alternate)		✓
Kirk Cook	WA Department of Agriculture		✓
Virginia "Ginny" Prest	WA Department of Agriculture (alternate)	✓	
Andy Cervantes	WA Department of Health		✓
Ginny Stern	WA Department of Health (alternate)	✓	
Charlie McKinney	WA Department of Ecology	✓	
Sage Park	WA Department of Ecology		✓
Lino Guerra	Hispanic Community Representative	✓	
Rick Perez	Hispanic Community Representative (alternate)		✓
Jessica Black	Heritage University		✓

*via phone

14 II. Welcome & Meeting Overview

15
16 Facilitator Jim Davenport called the meeting to order at 5:00 pm.

17 Moment of Silence.

18 Charlie McKinney introduced new member Lucy Edmondson, Director of EPA Region 10.
19 She is replacing Tom Eaton, who retired. He also stated that Kirk Cook has accepted a
20 position in Bend Oregon and will be replaced by Ginny Prest as the Department of
21 Agriculture primary representative. Jaclyn Hancock will serve as alternate. General
22 introductions followed.

III. Working Group Reports:

Data Collection Working Group – Melanie Redding, Chair

Melanie stated that Data Collection shares the GWAC’s goal to reduce nitrates concentrations in the groundwater below the state drinking water standards. Their objective is to collect data and monitor, identify problems, conclude measures to reduce groundwater contamination, and educate. She explained the Nitrogen Loading Assessment, describing the relative sources and where it is taking place.

Ambient Monitoring Program. The group is working with Steve Swope of Pacific Groundwater Group (PGG) on the initial scope of work (design and selection) for the installation of monitoring wells. The draft of the scope should be available for comment in the next few weeks.

PGG is designing a separate study focusing on hot spots, trends and how they can support other Ambient Groundwater Monitoring Programs; this work is still in the early stages.

Melanie continued that Kirk Cook, the Department of AG former lead, has accepted another position. Others from AG and Yakima County have stepped up to assist in his absence. She introduced Perry Beale, Department of AG, who is working on this project. Perry explained that he is trying to set the “typical use rate” and apply that standard number for each crop type.

The draft report Nitrogen Loading Assessment is due on October 16. It will be sent to the Data Collection group for review before being forwarded to the GWAC. A final product is anticipated in April 2016.

Livestock/CAFO Working Group – Charlie McKinney

No Report

Irrigated Ag Working Group – Jim Trull

The third round of deep soil sampling is underway at approximately 60 different fields. The group has spent time reviewing data. They have had good discussions but not a lot of

60 conclusions can be drawn due to limited number of sample sites and in some cases
61 incomplete data from those sample sites. Samples can only be gained from those farmers
62 willing to participate.

63
64 The group is working on a spreadsheet containing a listing of crops in the GWMA by acreage;
65 crop yield; nitrogen removed in the harvested crop; nitrogen consumed in plant growth; and
66 nitrogen from all sources applied to grow the crop. The group is not sure of the use of the
67 project yet—it could be input to the Nitrogen Loading Assessment for Irrigated Agriculture
68 work or it could be used for validating the numbers in the Nitrogen Loading Assessment. For
69 now, the group is just collecting information.

70
71 **RCIM Working Group – Robert Farrell**

72
73 The best estimate of maximum nitrogen loading is 55 to 60 pounds per acre per year. The
74 group determined that Yakima County should provide the work group with an estimate of
75 the number of residential parcels in the GWMA with an area of between 2 and 10 acres that
76 may be hobby farms. This information is requested to help resolve if the use of a sliding
77 scale of nitrogen loading, based upon area of the hobby farm, is appropriate.

78
79 There are two large septic systems in Yakima County which are regulated by the
80 Department of Health, both are located in the GWMA. A septic system over 3,500 gallons is
81 considered to be a large septic system.

82
83 RCIM would like to take the information received from the well assessment surveying and
84 revisit each location with high nitrates looking at different uses of the property and/or
85 neighboring properties such as lawns, pastures, and drain fields on hobby farms.

86
87 **Regulatory Framework Working Group – Jean Mendoza**

88
89 Washington State has been operating without a CAFO General Permit. The State is trying to
90 find the best pathway to complete the National Pollutant Discharge Elimination Systems
91 (NPDES) permit update. The plan is to have a permit by June 2016.

92
93 The Yakima County Planning Division gave a presentation to the Regulatory group on the
94 SEPA and critical area's processes. There are exemptions and regulations to the Growth

Management Act through these processes. It will be several months of work before the group is ready to present data to the GWAC.

Education and Public Outreach (EPO) Working Group – Lisa Freund

High Risk Well Assessment Survey Phase II. The contract with the Yakima Health District to conduct the well assessment surveying and sampling was approved by the County Commissioners on September 8, 2015. A 900 piece direct mail campaign to households in the GWMA was sent the same week inviting participation. The EPO has received 24 completed surveys and sampling results from the Yakima Health District. A total of 90 households in the GWMA have expressed interest in having their wells tested. EPO has noticed a smoother process this time around: the survey instrument is cleaner and the health district has a lot of experience conducting the surveys. The contract with the Health District is for 200 completed surveys by February 2016. The group anticipates meeting that goal.

Yakima County's website has a new look and in conjunction with that the GWMA website has undergone several changes. The GWAC resource lists were evaluated and it was determined many had no hits and others had dead links. EPO will be asking GWAC to scale down the resource list.

Jim asked Lisa to clarify "a dead link," and she explained it is a link that is no longer connected to a site or document: when the user clicks on it, they receive an error notice that the document or website cannot be reached.

Lisa provided instructions on how to access the new web page. She also explained that the new program has options for users to receive automatic notifications to their smart phone or email when a calendar, agenda or meeting summary has been posted. There is also an option to unsubscribe at any time. The County will still be providing the GWAC with updates via e-mail but plans to transition into the new system in early 2016.

IV. Procedure for consideration of USGS proposal for presentation – Jim Davenport

Jim Davenport distributed a letter from Dr. Matt Bachmann of USGS that he received recently. The letter noted that USGS will issue a press release next week (week of October 19) announcing its report on the particle tracking analysis model and explaining the results of this

work to the public. Matt offered to present the report to the GWAC and obtain its input on how to determine the optimal locations for manure applications.

After discussion, a suggestion was made to table the conversation until the report came out and was reviewed by the Data Collection working group. After Data Collection reviews the report, it will be discussed by the GWAC. There were no objections to proceeding with the suggestion.

Jim will respond to Matt with the GWAC's decision.

V. Committee Business

The committee approved the August 20, 2015 meeting summary as presented.

The group was asked if they wanted to keep the optional December 17 meeting on the calendar. The group agreed to keep it on the calendar noting it can be cancelled if there are insufficient agenda items for a meeting.

VI. Public Comment

A GWAC alternate pointed out that the Denny Blaine Board Room is a very convenient location to hold the GWAC bi-monthly meetings. Lisa pointed out that the room has no phone access. The group took a vote and decided they would like Lisa to check on the room's availability in 2016 and book as many GWAC meeting dates as possible at the facility.

VII. Next Meeting:

- Thursday, December 17, 2015 5:00 PM
- Location: Radio KDNA, 121 Sunnyside Ave, Granger, WA 98932

VIII. Next Steps

The meeting was adjourned at 6:41 p.m.

Meeting summary approved by the GWAC on February 18, 2016.

YAKIMA VALLEY GROUNDWATER MANAGEMENT AREA ADVISORY COMMITTEE (GWAC)

MEETING SUMMARY

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I. Call to Order

Roll Call: This meeting was called to order at 5:02 p.m. by Jim Davenport, Facilitator.

Member	Seat	Present	Absent
Stuart Turner	Agronomist, Turner and Co.,		✓
Chelsea Durfey			✓
Bud Rogers	Lower Valley Community Representative Position 1	✓	
Kathleen Rogers	Lower Valley Community Representative Position 1 (alternate)	✓	
Patricia Newhouse	Lower Valley Community Representative Position 2	✓	
Sue Wedam	Lower Valley Community Representative Position 2 (alternate)	✓	
Doug Simpson	Irrigated Crop Producer	✓	
Jean Mendoza	Friends of Toppenish Creek	✓	
Eric Anderson	Friends of Toppenish Creek (alternate)		✓
Jan Whitefoot	Concerned Citizens of the Yakama Reservation		✓
Jim Dyjak	Concerned Citizens of the Yakama Reservation (alternate)	✓	
Steve George	Yakima County Farm Bureau		✓
Frank Lyall	Yakima County Farm Bureau (alternate)	✓	
Jason Sheehan	Yakima Dairy Federation	✓	
Dan DeGroot	Yakima Dairy Federation (alternate)	✓	
Ron Cowin	Roza-Sunnyside Joint Board of Control		✓

	Roza-Sunnyside Joint Board of Control (alternate)		
Laurie Crowe	South Yakima Conservation District		✓
Jim Newhouse	South Yakima Conservation District (alternate)		✓
Robert Farrell	Port of Sunnyside	✓	
John Van Wingerden	Port of Sunnyside (alternate)		✓
Rand Elliott	Yakima County Board of Commissioners	✓	
Vern Redifer	Yakima County Board of Commissioners (alternate)	✓	
Ryan Ibach	Yakima Health District	✓	
Dr. Troy Peters	WSU Irrigated Agriculture Research and Extension Center	✓	
Lucy Edmondson	U.S. Environmental Protection Agency	✓	
Marie Jennings	U.S. Environmental Protection Agency (alternate)		✓
Elizabeth Sanchez	Yakama Nation		✓
Tom Ring	Yakama Nation (alternate)		✓
Virginia "Ginny" Prest	WA Department of Agriculture	✓	
Jaclyn Hancock	WA Department of Agriculture (alternate)		✓
Andy Cervantes	WA Department of Health	✓	
Ginny Stern	WA Department of Health (alternate)	✓	
Charlie McKinney	WA Department of Ecology	✓	
Sage Park	WA Department of Ecology		✓
Lino Guerra	Hispanic Community Representative	✓	
Rick Perez	Hispanic Community Representative (alternate)		✓
Jessica Black	Heritage University	✓	

*via phone

14 II. Welcome & Meeting Overview

15 Facilitator Jim Davenport asked the group to spend a moment thinking quietly about having
16 a positive, courteous, affirmative attitude in the discussion.

17
18 Jim then introduced Gary Bahr from the Washington State Department of Agriculture – Kirk
19 Cook's replacement. General introductions followed.

20
21 Jim Davenport informed the group that at the recent Irrigated Ag Working Group meeting
22 the group had recommended to the GWAC that they draft a letter of condolence (in light of
23 Jim Trull's) passing to Jim's widow and family to be signed by the members of the GWAC.
24 At this recommendation, a letter had been written and was presented. Jim asked Troy
25 Peters (as the new chair of the Irrigated Ag Working Group) to read the letter aloud to the
26 group. It was the consensus of the group to sign and send the letter as presented. Jim
27 reminded the members that they were not under compulsion to sign. Members were also

invited to vocalize remembrances of Jim. They stated that Jim had a very “even keel” personality, a respectful manner towards all viewpoints and he would be missed.

III. Chairman’s Report – Rand Elliott

Chairman Rand Elliott reported that Jean Mendoza, Jim Dyjak and Larry Fendell had recently requested to meet with him and Jim Davenport to discuss another GWAC member’s recent testimony to a State legislative committee in Olympia. Rand said that after listening to the group it was determined that the comments that were made were personal in nature and not on behalf of the GWAC. Rand reminded the group that they were free to express their personal opinions; however, the group needs to make sure they are stating them as such and that they are not representing the GWAC. Rand went on to say that he had sent a letter to the Chairman of the Legislative Committee (where the testimony was received) indicating that the GWAC had come to no conclusions or recommendations thus far.

A member asked whether the group was going to discuss the facilitator’s work and whether he should continue in that role. Jim Davenport thought this was a good idea. A discussion followed about his compensation for his facilitator services. Jim explained that he had a prior personal services contract with Yakima County to assist in their performance as lead agency of GWMA. When the previous facilitator’s contract was not renewed, Vern asked him if he would also fill that role. Vern asked Jim to estimate the additional cost to the County of this work. Jim responded that he would provide this additional service to the County at no additional cost, that he would volunteer his services for facilitation. The County is not invoiced for this additional work. The member then voiced a desire to have a GWAC meeting where the budget was disclosed. Vern Redifer reminded the group that the grant is between Yakima County and the Department of Ecology. Vern went on to say that the GWAC’s role is to help the County prioritize how the money is spent and that he does not have an issue with accounting to the GWAC how the money was spent. Another member reminded the group that the previous facilitator had charged \$4,000 to \$5,000 per meeting to moderate and that Jim’s volunteer services allow the County to save this amount.

One member asked that another GWAC member be censured for his comments to a State legislative committee. Jim Davenport advised that the other member should be present so that he might respond to and defend the allegations.

IV. Guidance from WAC 173-100-100 Re: GWAC Program – Charlie McKinney

Charlie encouraged the group to keep their eye on the prize – the GWMA program. He reminded the group to follow WAC 173-100 and provided an overview. Charlie addressed specifically several of the items from his overview - No. 4 is silent on the type of alternatives to deal with the problems. There is no discussion of regulatory, education or other types of other alternatives. The group must ask itself “what do we need to do to solve the

problem.” Additionally, Charlie noted under No. 5 that this is when the group will really zero in on the final product. At this point the group will take a look at the laundry list of problems, then make recommendations to solve the problems with a rationale why this is selected. The group will also want to include who they are making recommendations for, identify who should be leads at implementing each recommendation, i.e., agencies implementing regulations/recommendations (this is the group’s first audience). Under No. 6 Charlie felt some of this will be difficult without the help of the agency implementing the recommendations working on the plan. He also pointed out that the group must work with the agency to determine what it will cost to implement the plan and what the feasibility to implement the plan will be.

When the plan is done it must then go through 173-100-110 SEPA Review and 173-100-120 Hearings and Implementation in order to give the public input into this process. When all of this is complete the plan can then be implemented.

A member asked when the committee should start the SEPA review process in light of the December 2017 deadline. Vern responded that the SEPA timeline varies, but the entire process takes at least a couple of months. Vern felt the group would be in compliance if they had a draft done by December 2017. Ginny Stern pointed out that other GWMA didn’t make their deadlines but had things in place so that they could finish.

V. Report on Evaluation of USGS Particle Tracking Analysis Model – Ginny Stern

Ginny explained that the USGS took existing EPA data, and used a time-step application to estimate nitrate travel times based on flow data from 1959 to September, 2001. The model is designed to tell us how water moves in this County. Ginny explained that the particle tracking model is a useful tool and presents itself well. With this model it is possible to test the assumptions the GWAC is working with and answer questions like: “is this a near-term problem or something that comes before?” A member asked Ginny if the report could analyze legacy nitrates. Matt Bachmann (the author of the report from the USGS) stated that this report does not contain any measurements of nitrate concentrations, it is just about water and how old it is and where it came from. Jim Davenport added that this report will be discussed further in the Data Group.

VI. Working Group Reports:

Data Working Group – Ginny Stern: Ginny Stern presented the report provided by Chair, Melanie Redding. As to the Ambient Monitoring Network: PGG has a contract with Yakima

County for its design. PGG has consolidated data in GIS and they are developing maps. They will use this information to recommend early development of sample site locations. A preliminary report is anticipated at the March Data workgroup meeting for review and comment. The Nitrogen Loading Assessment is being written in three pieces: dairy/livestock sources, irrigated agriculture sources and RCIM sources. Three designated peer reviewers will provide a neutral technical review to determine that the study meets quality and professional standards. The dairy/livestock source component draft is currently undergoing peer review. The written irrigated agriculture and the RCIM pieces will be finished soon and available for peer review. Once peer review is complete, drafts of the reports will be shared with the workgroups for their review and comment. After revisions have been made, the full nitrogen loading assessment will be presented to the GWAC. Ginny shared Melanie's mantra for the workgroup noting that ultimately the group's goal is to ensure credible data that can be used by the GWAC to make decisions. A member voiced concerns about several issues. Ginny responded and said that the concerns were issues to deal with after the scientific proof, quality control and quality assurance is met.

Livestock/CAFO Working Group – Charlie McKinney: No report – the group did not meet.

Irrigated Ag Working Group – Troy Peters: Troy Peters reported the group had taken time to remember Jim Trull at its last meeting. They also reviewed the 2015 Deep Soil Sample results that were taken from 60 different sites. When the work is complete they will have four sets of samples from spring and fall 2015 and 2016. In addition, the group had a presentation and discussion about the preliminary work performed by the Washington State Department of Agriculture on the Nitrogen Loading Assessment and found some very useful conclusions could be drawn and that the variability of sources could be significant.

RCIM Working Group – Ryan Ibach: Jim Davenport reported this group also has a new chair, Ryan Ibach. He thanked Bob Farrell for his service as chair and reminded the group that Bob will remain a GWAC member. Ryan informed the group that in their latest meeting they had learned the breakdown of the number of parcels in Yakima County with an area of 10 acres or less not otherwise included in the irrigated agriculture mapping done by the Department of Agriculture– these were categorized as hobby farms. This information was provided by Yakima County's GIS Department. Hobby farms thus determined total 2,757 acres. There are three categories: 0 to 2.5 Acres = 2,323 acres; 2.6 to 5 Acres = 314 acres; and 5.1 to 10 Acres = 120 acres. He went on to explain that the GWMA contains 175,161.2 acres of land, leaving hobby farms as 1.6 percent of the total. At

the group's next meeting they will be discussing septic systems and biosolids. A member asked how the group had defined a hobby farm. Vern indicated that they utilized what the GIS system knew about properties by looking at smaller parcels, not single residential parcels, 10 acres or less, agricultural crop land or animals on it and then proofed their conclusions with aerial photos.

Regulatory Framework Working Group – Jean Mendoza: The group has heard presentations from many agencies over the past year and would hear next from the irrigation districts, Yakama Nation and WSDA Fertilizer application. The group would then begin work toward meeting the goals and objectives put into place in the 2012 Work plan (Sections 3.0-3.9). They will also consider authority, feasibility, cost, time, monitoring, effectiveness and enforcement. The group has the task of developing alternative management plans and for presenting these potential solutions to the GWAC. Jean also reported that Jim Davenport has begun describing Regulatory Framework in a written document. He has created a table that looks at the major regulations which are cross-referenced by source and topic – Laws and Regulations, Sources of Nitrogen, Atmospheric Deposition, Compliance and Enforcement. Jean was pleased to announce that Vern had affirmed his agreement to create a Regulatory Framework web page. The content will be vetted by the working group.

Education and Public Outreach (EPO) Working Group – Lisa Freund: Lisa was pleased to report the success of the Web Assessment Survey Phase II and gave kudos to the EPO Working Group as they have worked very hard on outreach for the survey. She reported that the EPO had continued its outreach (flyers, radio ads) to reach its goal of 200 completed surveys. As of December 31, 2015, 115 sampling surveys were completed. In January 2016, to reach the goal of 200 surveys, a second direct mail piece was sent to 350 households in the GWMA inviting them to participate. This resulted in a jump in requests to participate in the survey. As of February 11, 240 had requested the survey (a 100 percent increase from December). Accordingly, Yakima County extended the well assessment contract with the Health District from \$50,000 to \$70,000 (80 additional surveys). The term was also extended from February 29 to March 31. The community survey (English and Spanish) will go live next week on the GWMA website in order to measure the public's awareness. In addition, Notify Me, which was introduced to the GWAC at the October 2015 meeting has experienced some glitches which has delayed Yakima County from working with it exclusively. Feedback indicates email notification is working better than text messages on mobile phones. With the 2015 website redesign, the resources page was

streamlined. In October the EPO recommended to this group that resources (links to other sites and documents) should only be added back to the site if there is agreement by this group. Lisa then deferred to a group member who was requesting that the GWAC put the VanderSlice research done in 2004/2005 in the Columbia Basin surveying children under six months and the effects of nitrates in the water in their systems back on the website. It was the consensus of the group to put this research back on the website.

VII. Report on High Risk Well Assessment Survey Results

A chart and map was provided of the sampling survey test results through February 15, 2016, in the meeting packet. Vern believed it would be wise not to state trends or conclusions until all the surveys are done at the end of March. He did note however that the highest percentage of wells that have bacteria in them have less nitrates. Matt Bachmann noted that bacteria doesn't flow as easily as nitrates do.

VIII. Groundwater Monitoring Program Update/Inter-Agency Agreement: Yakima County and Ecology – Vern Redifer

Vern observed that Ginny had already addressed the progress of the Ground Water Monitoring Program in her Data Working Group report. He advised the group that the contract between the Department of Ecology and the County of Yakima had been signed – a copy was enclosed for the members. A member asked if there was much chance of receiving money beyond the terms of this contract. Vern pointed out that the first paragraph stated the expectation "whereas this is expected to be the final appropriation" A member inquired as to whether the group should start advocating for more money. Other members indicated that in their experience in working with GWMA in other regions if the majority of the work is done there could be a host of opportunities for funding at that time. Vern pointed out that the answer to a request for funding is never a solid no – as the group writes the program and develops implementation there are ways to keep meeting goals.

IX. Committee Business

The committee approved the October 15, 2015, meeting summary as presented. It also approved the 2016 GWAC Meeting Schedule as presented on the meeting agenda. Instructions for signing up for automatic calendar and agenda notifications for GWAC and working group meetings can be found in the meeting packet.

Jim Davenport stated that the agenda provided for an opportunity to thank Charlie McKinney as this was his last meeting. He noted that for the past year and a half he had observed Charlie's objectivity and ability to settle arguments – he has been a valuable asset and provided a great deal of knowledgeable information. Charlie responded that it had been good to work on something so worth while and to get to know the entire group. He noted that Yakima County's responsibility for being the lead agency was not a small task.

He felt the County had done an excellent job. Jim then invited the group to express their thanks to Charlie, and to give their opinion about the progress of the GWAC. Many members thanked Charlie for his effort and participation. He will be missed. One member noted that Charlie had a way of explaining things in laymen's terms which had been appreciated.

Members expressed optimism for meeting the December 2017 deadline (although the process seemed quite slow), expressed appreciation for the members' efforts and common goals and are looking forward to evaluating proposals, suggestions, work plans and decisions. A member was concerned that sometimes the group was too negative about what hadn't yet been accomplished and missed the small successes – more had been done in a year than the group realized. Another member shared concern as well about the transition when the deadline is met and how the political climate may impact the application of GWMA. Several people involved with GWMA in other areas offered that have not seen this kind of work product done in this short amount of time. They felt this was a hard working group of people and were encouraged by people working together.

Members expressed a concern about what is being written via email to carry on squabbles with other members of the group. It was their perception that a compromise will be the end result – no one is going to get exactly what they want. The group was encouraged to keep their eye on the big picture – focus and set aside differences – Charlie had provided a good example of this attitude. Most of the people sitting in the room lived in the GWMA and had a vested interest in its outcome. Some members were encouraged by the education effort. They felt it was exceptional and working quickly and effectively. It has people talking about nitrates and they are interested in a profitable outcome as well. People are paying attention and that makes a difference. Some members expressed that they had been concerned over the number of chairs lost in the past few months, but were encouraged with their replacements and their fresh momentum.

Ginny Prest announced the "Sustainable Groundwater in Agriculture Conference Linking Science and Policy 2016" to be held June 28-30, 2016, in San Francisco, California. She strongly encouraged the GWAC to send representatives.

X. Public Comments

Public Comments are included in the round table discussion notes found above.

XI. Next Meeting:

Thursday, April 21, 2016, 5:00 PM

Location: Denny Blaine Boardroom, 810 East Custer Avenue, Sunnyside, WA 98944

XII. Next Steps



Groundwater Management Area (GWMA):

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

259 The meeting was adjourned at 7:15 PM

260 Meeting summary approved by the GWAC on _____.

Meeting Time and Location**Thursday, February 18, 2016 5:00 p.m. – 7:00 p.m.**

Denny Blaine Boardroom
810 East Custer Ave.
Sunnyside, WA 98944

Regular GWAC Meeting

Time	Topic	
5:00 – 5:20 p.m.	Welcome, Meeting Overview and Introductions: <ul style="list-style-type: none"> • Committee members • Others attending the meeting 	Jim Davenport, Facilitator
	Remembering Jim Trull	
5:20 – 5:25 p.m.	Chairman's Report	Rand Elliott
5:25 – 5:35 p.m.	Guidance from WAC 173-100 Re: GWAC Program	Charlie McKinney
5:35 – 5:40 p.m.	Report on Evaluation of USGS Particle Tracking Analysis Model	Ginny Stern
5:40 – 6:20 p.m.	Working Group Reports <ul style="list-style-type: none"> • Data Collection • Livestock/CAFO • IAWG • RCIM • Regulatory Framework • EPO 	Ginny Stern Charlie McKinney Troy Peters Ryan Ibach Jean Mendoza Lisa Freund
6:20 – 6:30 p.m.	Report on High Risk Well Assessment Survey	
6:30 – 6:40 p.m.	Groundwater Monitoring Program Update Inter-Agency Agreement: Yakima County and Ecology	Vern Redifer

**Groundwater Management Area (GWMA):**

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

Time	Topic
6:40 – 6:50 p.m.	Committee Business <ul style="list-style-type: none"> • Approve the October 15, 2015 GWAC Meeting Summary • Approve the 2016 GWAC Calendar • Future GWAC Meeting Notices
	Thanking Charlie McKinney
6:55 – 7:00 p.m.	Public Comment
7:00 p.m.	Adjourn

2016 – Proposed GWAC Meeting Calendar (all meetings are 5:00 - 7:00 p.m.)

- Thursday, February 18, 2016
- Thursday, April 21, 2016
- Thursday, June 16, 2016
- Thursday, August 18, 2016
- Thursday, October 20, 2016
- Thursday, December 15, 2016 (TBD)

Committee Members

Stuart Turner, agronomist, Chelsea Durfey (alternate)	Turner and Co.
Bud Rogers, Kathleen Rogers (alternate)	Lower Valley Community Representative Position 1
Patricia Newhouse, Sue Wedam (alternate)	Lower Valley Community Representative Position 2
Doug Simpson	Irrigated Crop Producer
Dr. Jessica Black	Heritage University
Jean Mendoza, Eric Anderson (alternate)	Friends of Toppenish Creek
Jan Whitefoot, Jim Dyjak (alternate)	Concerned Citizens of the Yakama Reservation
Steve George, Frank Lyall (alternate)	Yakima County Farm Bureau
Jason Sheehan, Dan DeGroot (alternate)	Yakima Dairy Federation
Ron Cowin	Sunnyside-Roza Joint Board of Control
Laurie Crowe, Jim Newhouse (alternate)	South Yakima Conservation District

**Groundwater Management Area (GWMA):**

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

Robert Farrell, John Van Wingerden (alternate)	Port of Sunnyside
Rand Elliott, Vern Redifer (alternate)	Yakima County Commission
Ryan Ibach	Yakima Health District
Dr. Troy Peters	WSU Irrigated Agriculture Research and Extension Center
Lucy Edmondson, Marie Jennings (alternate)	U.S. Environmental Protection Agency
Elizabeth Sanchey, Tom Ring (alternate)	Yakama Nation
Virginia "Ginny" Prest Jaclyn Hancock (alternate)	Washington Department of Agriculture
Andy Cervantes, Ginny Stern (alternate)	Washington Department of Health
Charlie McKinney, Sage Park (alternate)	Washington Department of Ecology
Lino Guerra, Rick Perez (alternate)	Hispanic Community Representative

Committee Ground Rules:

- Come to committee meetings prepared
- Treat one another with civility
- Respect each other's perspectives
- Listen actively
- Participate actively
- Honor time frames
- Silence electronic devices during meetings
- Speak from interests, not positions.

2016 Proposed Meeting Dates:

February 18
April 21

June 16
August 18

October 20
December 15

**Groundwater Management Area (GWMA):**

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water

Meeting Materials:

Name	Date Provided	From
2015_1015_GWAC_DraftMeetingSummary	10/30/2015, 12/10/15, & 2/11/16	lisa.freund@co.yakima.wa.us
Meeting Agenda	2/11/2016	lisa.freund@co.yakima.wa.us
WAC 173-100-100 Groundwater Management Program Content	At Table	
Data Collection Working Group Reports of October 8, November 12, December 10, 2015; and January 14, 2016	12/10/15 & 2/11/2016	lisa.freund@co.yakima.wa.us
IAWG Working Group Reports of October 13 and December 15, 2015	12/10/15 & 2/11/2016	lisa.freund@co.yakima.wa.us
Regulatory Framework Working Group Reports of October 14 and November 18, 2015; and January 13, 2016	12/10/15 & 2/11/2016	lisa.freund@co.yakima.wa.us
RCIM Working Group Report of January 28, 2016	2/11/2016	lisa.freund@co.yakima.wa.us
EPO Working Group Reports of October 7, 2015; and January 6 and February 3, 2016	2/11/2016	lisa.freund@co.yakima.wa.us
Well Assessment Survey Test Results	At Table	
Sign-up instructions for "Notify Me" (Meeting and Agenda Notifications)	12/10/15 & 2/11/2016	lisa.freund@co.yakima.wa.us

GWAC Attendance Roster

Member	18-Feb-2016
Stuart Turner	Absent
Chelsea Durfey	Absent
Bud Rogers	Present
Kathleen Rogers	Present
Patricia Newhouse	Present
Sue Wedam	Present
Doug Simpson	Present
Jean Mendoza	Present
Eric Anderson	Absent
Jan Whitefoot	Absent
Jim Dyjak	Present
Steve George	Present
Frank Lyall	Present
Jason Sheehan	Present
Dan DeGroot	Present
Ron Cowin	Absent
Laurie Crowe	Absent
Jim Newhouse	Absent
Robert Farrell	Present
John Van Wingerden	Absent
Rand Elliott	Present
Vern Redifer	Present
Ryan Ibach	Present
Dr. Troy Peters	Present
Lucy Edmondson	Present
Marie Jennings	Absent
Elizabeth Sanchey	Absent
Tom Ring	Absent
Virginia "Ginny" Prest	Present
Jaclyn Hancock	Absent
Andy Cervantes	Present
Ginny Stern	Present
Charlie McKinney	Present
Sage Park	Absent
Lino Guerra	Present
Rick Perez	Absent
Jessica Black	Present
Matt Bachmann	Present

40060

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Address: 128 NORTH 2ND STREET ROOM 408

YAKIMA, WA 98901

Telephone: (509) 574-2343 Fax:

Account Rep: Simon Sizer- Legals - 398

Phone #: (509) 577-7740

Email: ssizer@yakimaherald.com

Yakima County

Notice of Public Meeting
Lower Yakima Valley
Groundwater Advisory
Committee

NOTICE IS HEREBY GIVEN
that Yakima County is holding
a public meeting of the Lower
Yakima Valley Groundwater
Advisory Committee on
Thursday, February 18, 2016
at 5:00 PM at Denny Blaine
Boardroom, Sunnyside
School District #201, 810 E.
Custer, Sunnyside, WA 98944
pursuant to Chapter 173-100-
080 WAC Ground Water Man-
agement Areas and Programs.

For Additional Information

To learn more about the
Lower Yakima Valley Ground-
water Management Area,
the Groundwater Advisory
Committee, and its goals and
objectives, please see the
Lower Yakima Valley Ground-
water Management Area on
the County webpage at: <http://www.yakimacounty.us/gwma/>

For more information about the
meeting, please contact Lisa
Freund, Yakima County Public
Services Administrative Man-
ager at 574-2300.

If you are a person with a dis-
ability who needs any accom-
modation in order to participate
in this program, you may be
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at Yakima County no later than
five (5) working days prior to
the date service is needed.

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Yakima, WA 98901
(509) 574-2210
7-1-1 or 1-800-833-6384
(Washington Relay Services
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8, 2016

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STATE OF WASHINGTON,)

COUNTY OF YAKIMA)

Debbie Martin, being first duly sworn on oath deposes and says that she/he is the Accounting clerk of Yakima Herald-Republic, Inc., a daily newspaper. Said newspaper is a legal newspaper approved by the Superior Court of the State of Washington for Yakima County under an order made and entered on the 13th day of February, 1968, and it is now and has been for more than six months prior to the date of publication hereinafter referred to, published in the English language continually as a daily newspaper in Yakima, Yakima County, Washington. Said newspaper is now and has been during all of said time printed in an office maintained at the aforesaid place of publication of said newspaper.

That the annexed is a true copy of a:
Yakima County Notice of Public Meeti

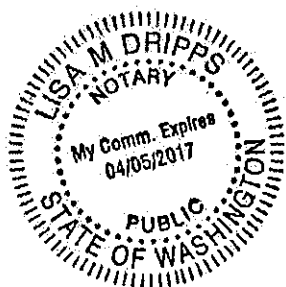
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Yakima Herald-Republic 02/10/16
YakimaHerald.com 02/10/16

and the such newspaper was regularly distributed to its subscribers during all of the said period. That the full amount of the fee charged for the foregoing publication is the sum of \$105.60

Debbie Martin

Accounting Clerk



Sworn to before me this 10th day of February 2016

Lisa M. Driggs

Notary Public in and for the
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residing at Yakima

Yakima County

**Notice of Public Meeting
Lower Yakima Valley
Groundwater Advisory
Committee**

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Custer, Sunnyside, WA 98944
pursuant to Chapter 173-100-
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water Management Area on
the County webpage at: [http://
www.yakimacounty.us/gwma/](http://www.yakimacounty.us/gwma/)

*For more information about the
meeting, please contact Lisa
Freund, Yakima County Public
Services Administrative Man-
ager at 574-2300.*

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**Dated this Tuesday, February
8, 2016**

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Roger Harnack, being first duly sworn on oath deposes and says that he is the Publisher of the DAILY SUN NEWS, a daily newspaper.

That said newspaper is a legal newspaper and it is now and has been for more than six months prior to the date of publications hereinafter referred to, published in the English language continually as a daily newspaper in the city of Sunnyside, YAKIMA County, Washington, and it is now and during all of said time printed in an office maintained at the afforesaid place of publication of said newspaper, and that the said Daily Sun News was on the 4th Day of April, 1969 approved as a legal newspaper by the Superior Court of said Yakima County.

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Yakima County Public Services
Public Meeting 2/18/16

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Subscribed and sworn to before me 02/10/16

Notary Public in and for
the State of Washington
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Yakima County
Notice of Public Meeting
Lower Yakima Valley Groundwater
Advisory Committee

NOTICE IS HEREBY GIVEN that Yakima County is holding a public meeting of the Lower Yakima Valley Groundwater Advisory Committee on Thursday, February 18, 2016 at 5:00 PM at Denny Blaine Boardroom, Sunnyside School District #201, 810 E Custer, Sunnyside, WA 98944 pursuant to Chapter 173-100-080 WAC Ground Water Management Areas and Programs.

For Additional Information

To learn more about the Lower Yakima Valley Groundwater Management Area, the Groundwater Advisory Committee, and its goals and objectives, please see the Lower Yakima Valley Groundwater Management Area on the County webpage at: <http://www.yakima-county.us/gwma/>

For more information about the meeting, please contact Lisa Freund, Yakima County Public Services Administrative Manager at 574-2300.

If you are a person with a disability who needs any accommodation in order to participate in this program, you may be entitled to receive certain assistance at no cost to you.

five (5) working days prior to the date service is needed.

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Dated this Tuesday, Feb. 8, 2016
PUBLISH: DAILY SUN NEWS
February 10, 2016

[Education and Public Outreach]

Charge from Groundwater Management Area Advisory Committee

Working Group Members

Andres Cervantes (GWAC-DOH), Jean Mendoza (GWAC-Friends of Toppenish Creek), Elizabeth Torres (Citizen), Gretchen Stewart (EPA), Nieves Negrete (Citizen), Patricia Newhouse (GWAC-Citizen Rep Position #2), Dean Effler (Citizen), Joye Redfield-Wilder (Ecology), Stuart Turner (GWAC-Turner & Co), Ignacio Marquez (AGR);) Jessica Black (GWAC); Lisa Freund (Yakima County-Chair)

Meetings/Calls Dates

Meeting: Wednesday, January 6, 2016 from 1:30 p.m. to 3:30 p.m.

Participants

Lisa Freund (Chair-Yakima County), Patricia Newhouse (GWAC), Ignacio Marquez (AGR), Jim Davenport, and Lee Murdock (Yakima County), Karri Espinoza (Yakima County), *Gretchen Stewart (EPA), *Jean Mendoza (GWAC)

*Via phone

Key Discussion Points

Phase II High Risk Well Assessment – Lisa Freund

Lisa reported that the Yakima Health District has completed 120 sampling surveys, and 12 more interested parties called in this week requesting to be tested. The uptick was likely due to the second direct mail piece that was sent to over 350 households at the end of December. The same methodology was used to choose the 350 household mailing list as was used previously: areas targeted were where known nitrate data gaps exist and areas where high nitrates have been previously identified. A member asked if the survey result areas had been mapped. Lee responded that no, a summary has not yet been completed. It will be mapped as part of her survey analysis summary.

Ignacio reported that he and Andy had to cancel their live radio show on Spanish-language Radio KDNA in December due to bad weather conditions. They did have one person who participated in the survey who was agreeable to giving his testimony on the air; however, he was unavailable on the scheduled date.

Ignacio also reported that he had distributed flyers to the Granger and Zillah food banks. Lisa passed out a tracking sheet identifying where and how many flyers have been distributed: as of December 1, over 1,000 had been distributed to over 30 locations and/or events throughout the Lower Yakima Valley GWMA.

Lisa reminded the group that the contract with the Yakima Health District calls for 200 surveys. We are approximately 70 survey short of that number. The contract expires February 29, 2016.

ACTION: Lee will prepare a summary map of the areas surveyed the week of January 11th.

Lisa will prepare and mail testing results letters to the people who participated in the survey by the end of January.

Lisa will issue a new release as a companion piece to the second mailing, and also as a reminder for people to sign up.

Ignacio will check with KDNA to see if they aired last year's recording in December and if they can reschedule the live show for late January.

Lisa will contact Jill Trull to ask if IAWG would like assistant from EPO regarding outreach for deep soil sampling participation.

Civic Plus Website -Lee Murdock

Lee suggested that everyone review the website, and sign up for meeting notifications and agendas they would like to receive. Lisa added that February is the last month she will be sending out e-mail notifications to the EPO; after February, notifications will be strictly through the Civic Plus notification service.

Jim Davenport reported that he received multiple notices for what he believes were a single meeting. He asked staff to check which notifications he is signed up for, and report back to him. Pat stated she had also received multiple notifications. She was asked to forward those notifications to Lisa so County staff can review, investigate, and correct as needed.

ACTION: Lee will cross check the notification list with the GWAC members list to see who has and has not signed up yet.

Pat will forward her recent CivicPlus meeting and agenda notifications to Lisa.

Prevention Campaign 2015 – Gretchen Stewart

Gretchen presented two ideas that the *ad hoc* Prevention Committee came up with at their meeting in October. One was to create a traveling dual-language exhibit booth with a banner that can be set up for events or as a stand-alone exhibit at various locations. The second was to spend the funds allocated for the prevention campaign on a marketing firm. The firm would be tasked with developing (identify audiences and key messages) and executing a marketing plan on behalf of the GWAC. In the bid we would ask the firm to develop materials based on audiences and messaging. Ignacio explained that the thought behind the suggestion was that no one on the outreach group has the experience, knowledge or time to develop and execute outreach.

The group had a lengthy discussion on both ideas and agreed that the traveling booth is a good idea and is affordable under the budget. The ad hoc committee was tasked with moving forward with this idea and bringing back details for the EPO's consideration. The marketing firm idea was

tabled for a future meeting as most members feel a lot of the work has already been completed by the EPO and a more in-depth discussion is needed before a decision is made.

ACTION: **Gretchen (ad hoc) committee** will develop the full concept (propose components/features and pricing) for the traveling exhibit and bring it back to the EPO for its consideration in March.

Identifying Remaining Tasks and Deadlines for EPO's Funded Projects

Lisa reviewed EPO's four funded projects: creating and maintaining a new GWMA website, conducting the High Risk Well Assessment Phase II, the Education and Outreach Campaign, and conducting additional Outreach surveys. The group identified the remaining tasks for each project, its deliverables, and due dates for each deliverable.

Project	Remaining Tasks	Deliverables	Due Dates
GWMA Website	The new website creation is complete.	Operational maintenance, on-going meeting and agenda notifications	On-going
	Maintenance on-going	Support other EPO Initiatives (e.g.: web survey to evaluate outreach methods)	Web survey: end of January other initiatives: TBD
Well Assessment Phase II	Send out results letters to participants	*Is retesting of those who have agreed to it if we run low on our goal of 200 going to occur?	Late Jan & on-going
	News Release-reminder to participate		Now
	Long-Term monitoring participants (to get up to 200)		February 29, 2016
	Identify 2016 strategy		February 2016
ED/Outreach Campaign	Complete survey/report out		March 2016
	Estimate the cost of trade show booth visual impact: posters, banner (\$5,000-\$6,000).		EPO March, 2016

	Determine components of display (large & table top)		Bring back to EPO in March
	Obtain GWAC approval of exhibit concept & content		GWAC, April 2016
	Outside Marketing Firm Decision		February 2016
Outreach Surveys	Launch Web-based survey		February 2016
	Make survey available at Events (web-based or paper)		February 2016
	Defer intensive (door to door surveys) until GWAC has products and/or recommendations to share with the public		TBD

Resources Requested

- None

Recommendations for GWAC

- None

Deliverables/Products Status

- SEE CHART ABOVE

Proposed Next Steps

- Next EPO meeting: Wednesday, February 3, 2016 Yakima County Courthouse Rm 419.
Time: 1:30pm-3:30pm

[Education and Public Outreach]

Charge from Groundwater Management Area Advisory Committee

Working Group Members

Andres Cervantes (GWAC-DOH), Jean Mendoza (GWAC-Friends of Toppenish Creek), Elizabeth Torres (Citizen), Gretchen Stewart (EPA), Nieves Negrete (Citizen), Patricia Newhouse (GWAC-Citizen Rep Position #2), Dean Effler (Citizen), Joye Redfield-Wilder (Ecology), Stuart Turner (GWAC-Turner & Co), Ignacio Marquez (AGR);) Jessica Black (GWAC); Lisa Freund (Yakima County-Chair)

Meetings/Calls Dates

Meeting: Wednesday, February 3, 2016 from 1:30 p.m. to 3:30 p.m.

Participants

Lisa Freund (Chair-Yakima County), Joye Redfield-Wilder (Ecology), Andres Cervantes (GWAC-DOH), *Gretchen Stewart (EPA), *Jessica Black (GWAC), Lee Murdock, Karri Espinoza and Phil Rosenkranz (Yakima County)

*Via phone

Key Discussion Points

Civic Plus Website

Lisa Freund and Phil Rosenkranz presented the GWMA Public online survey. The survey was prepared with a software called Survey Monkey and mirrors the hard copy GWMA door to door survey that Heritage University students conducted in 2013.

The group discussed the language for the introduction to the survey and all present stated they did not require a review before the survey goes live on the web.

ACTION: **Lisa & Phil** will add an introduction to the on-line survey, and add “property” to the address line on question #1. On question 20 (*Where have you heard of the GWMA?*) They will add the following options to the list: direct mail (letters), flyers, events and online. Phil will also add a text box next to “other” so specific information can be entered.

Lee Murdock distributed a printed copy of the EPO Civic Plus “notify me” sign-up sheet. She indicated that not everyone on the EPO roster has signed up for notifications. However, all members of the GWAC who are members of EPO have signed up. Lee also shared that she does not recommend signing up to receive notifications via text message because of some glitches in the system. However the e-mail notification option is working well.

ACTION: Lisa will contact the EPO members who have not signed up to receive Civic Plus notifications, reminding them that the time is quickly approaching when the Civic Plus “notify me” will be the only meeting and agenda notification system used. (March 2016)

Phase II High Risk Well Assessment Survey Update – Lisa Freund & Lee Murdock

Follow Up Letters to Participating Households

115 personalized well testing result letters in English and Spanish, with individual survey results, were mailed on February 1, 2016 to the households that participated in well testing between September and December 2015. Informational, bilingual hand-outs on coliform, nitrate, private wells and septic system maintenance were also enclosed with the letters. Moving forward, letters will be batched and sent monthly to households so they receive their results more quickly.

2016 Outreach

In addition to a second direct mail letter inviting survey participation, a companion news release reminding people to sign up before the February 29 deadline was issued to the media in January. Lisa reported that both the Sunnyside Daily Sun News and the Yakima Herald Republic ran articles about the program. She also had two TV interviews in response to the release. Both venues prompted a strong response and currently 216 households have either been tested or have requested to participate, exceeding the EPO’s goal of 200 households.

A member noted that the Flint Michigan municipal water contamination issue is likely adding to the local interest in water testing. Discussion ensued regarding additional outreach before the February 29 deadline. Lisa noted that it’s unknown whether the final radio outreach—the KDNA news program—has been rescheduled.

ACTION: Lisa will contact Ignacio Marquez to check the status of scheduling the KDNA one-hour public program.

Identify 2016 Strategy – Lisa Freund

Lisa reminded the group that the GWAC approved a \$100,000 line item for the EPO to conduct high risk well surveys over two years (2015-16). \$50,000 has already been obligated to the health district for the initial 200 surveys and sampling. An additional \$10,000 has been spent and/or obligated for advertising, direct mail, and staff time associated with outreach and data analysis. With the recent interest in well testing pushing demand above the 200 household goal, she noted that the County is working with the health district to amend the contract to provide for 40 additional surveys. [Note: as of 2/11/16, demand has exceeded 240 surveys. The contract will be amended to allow for 280 surveys]

This will leave enough remaining budget for roughly 96 additional surveys to be conducted in 2016. She asked group for its recommendations.

The group discussed who the target audience should be for the remaining surveys. It was agreed that the households that participated in Phase I (2013-14), and specified they were interested in being surveyed again, would be offered the opportunity to participate provided we are able to

retest at a different season. It was noted that the sampling should take place in a different season than their original testing to determine if there are any differences in water quality between irrigation season and the winter months.

ACTION: Lee will provide Lisa with a list of Phase I households that indicated they would like future testing.

Lisa will draft the invitation to send to those households.

Lee shared a map of the areas that have participated in EPO's well assessment surveying from 2013 to present. It indicated what year they were surveyed by colored dots. Everyone thought it was very helpful and gives a great overview of the surveyed areas. Andy Cervantes suggested that more locator details be added to the map (e.g., city names) before it is presented to the GWAC.

Prevention Campaign – Gretchen Stewart

Tabled to the next meeting [note: Gretchen had left the call by this time]

Resources Requested

- None

Recommendations for GWAC

- None

Deliverables/Products Status

- 200 Phase II High Risk Well Assessments are complete or in process.
- Due to high demand, the contract with the Yakima Health District will be amended to allow additional surveying and sampling through March 2016.
- Remaining funds will be used to re-survey Phase 1 (2013-14) participants who expressed interest in being retested, and whose sampling survey can be done in a different season than their original sampling.

Proposed Next Steps

- Next EPO meeting: Wednesday, March 2, 2016 Yakima County Courthouse Rm 419. Time: 1:30pm-3:30pm

[Education and Public Outreach]

Charge from Groundwater Management Area Advisory Committee

Working Group Members

Andres Cervantes (GWAC-DOH), Jean Mendoza (GWAC-Friends of Toppenish Creek), Elizabeth Torres (Citizen), Gretchen Stewart (EPA), Nieves Negrete (Citizen), Patricia Newhouse (GWAC-Citizen Rep Position #2), Dean Effler (Citizen), Joye Redfield-Wilder (Ecology), Stuart Turner (GWAC-Turner & Co), Ignacio Marquez (AGR), Jessica Black (GWAC); Lisa Freund (Yakima County-Chair)

Meetings/Calls Dates

Meeting: Wednesday, March 2, 2016 from 1:30 p.m. to 3:30 p.m.

Participants

Lisa Freund (Chair-Yakima County), Patricia Newhouse (GWAC-Citizen Rep Position #2), Jim Davenport (Yakima County) *Gretchen Stewart (EPA), *Jessica Black (GWAC), *Andres Cervantes (GWAC-DOH), *Ignacio Marquez (AGR), *Jean Mendoza (GWAC-Friends of Toppenish Creek), Lee Murdock, Karri Espinoza (Yakima County)

*Via phone

Key Discussion Points

Phase 2 High Risk Well Assessment Survey Update – Lisa Freund

Lisa reviewed the Well Assessment Survey Test Results handout presented to the GWAC at its February meeting. Since Phase I surveying began in 2014, a total of 288 wells have been tested for nitrate & bacteria and the results entered in the County's database. Due to strong demand in Phase II, the contract with the Yakima Health District was amended to allow for an additional 80 surveys (up from the original 200). The deadline to participate was also extended from February 29 to March 31. A news release announcing the deadline extension was issued on March 1, 2016 and received newspaper and TV coverage. Results letters are being sent out monthly.

As of this date, 248 Phase II surveys have either been completed or are in process. This brings the grand total (Phase I and II combined) to 419 surveys.

By the end of April all of the surveys should be electronically entered into the database and the remaining results sent to participating households. In May the data will be analyzed and results shared with EPO and GWAC.

Phase II Outreach

On February 19, Andy Cervantes and Ignacio Marquez participated in a one-hour Radio KDNA public affairs program to talk about the survey. They felt it went well. They had one person call in and he was advised to call the Health District and get his well sampled. Ignacio shared that the interviewer, although not as knowledgeable as the previous interviewer, asked good questions and a lot of information was shared.

It was agreed that once the March 31 survey deadline passes, the message needs to change from “get your well tested” to “you need to maintain your system, keep good well logs, and continue testing your well once a year.”

Jim Davenport inquired whether well depth to water level information was obtained from the surveys. It was not. However, Andy Cervantes noted that there may be equipment or training available for the Yakima County Public Services to perform static water level tests on their water systems. He added that it’s best to locate and target wells in the GWMA area, where information is not readily available. In response to a question from Jim Davenport about well (selection/information), it is best to locate wells of varying depths, better with well logs or construction information, to get data on Nitrate level versus static water level.

Lisa shared that she received a call from a resident in the lower valley who is interested in participating in long term well testing. She also received a call from a resident south of Mabton who has had his well sampled three times since 1988. The resident is willing to talk to other working groups if asked.

ACTION: Lisa will provide a summary report of Phase II by the end of May 2016

Traveling Booth Recommendation - Gretchen Stewart, Ignacio Marquez, Pat Newhouse

The *ad hoc* group had met regarding the traveling booth and presented a menu of options for the EPO’s consideration.

A discussion took place as to what that booth would look like, what information (messaging) it would share, where it would be displayed and who would volunteer to man the booth.

Some of the ideas were:

<u>Locations:</u>	<u>Content:</u>	<u>Volunteers:</u>
Health Fairs	Prevention Information	EPO Members
Libraries	Participation Information	Other Working Groups
Schools	Protection Information	Self Information Booth

Community Events

EPO Members

Gretchen shared the quotes that the *ad hoc* committee developed. Lee Murdock noted that some of the menu options could be produced by the Yakima County Printing department (e.g., Velcro 72"x36" display board for \$140 and photos/materials for \$25 each). The design of the materials will still need to be outsourced.

Jim suggested that a list should be prepared of which events the display would be used at, what materials would be needed and how many volunteers are willing to support this type of outreach. This would help in making a decision as to whether the display board is a good way to use resources.

Another member suggested involving other working groups to help participate at the events.

It was agreed by all that it would be best to have all members of the EPO in one room to discuss and make decisions regarding the traveling booth.

ACTION:

Gretchen offered to create a list of upcoming community events and locations where the display board could be set up. The list will include a column for volunteers to sign up to man the booth.

Gretchen will forward the list to Lisa for EPO distribution and for volunteer sign up.

Lisa will send the completed list to EPO members asking for volunteers.

Lisa will send out a doodle poll to identify potential meeting dates where everyone could be in the same room to discuss the traveling booth concept.

Resources Requested

☐ None

Recommendations for GWAC

☐ None

Deliverables/Products Status

-
- Create a summary report of the Phase II Well Assessment Survey by the end of May 2016

Proposed Next Steps

- Create a list of upcoming community events and distribute to the EPO for volunteer sign up.
- Determine traveling booth components based on event and volunteer staffing list.
- Identify date/time for an EPO meeting where participants can attend in person.

Irrigated Ag Working Group (IAWG)

Charge from Groundwater Management Area Advisory Committee

Working Group Members

Dr. Troy Peters (GWAC-WSU); Bob Stevens (interested party) Bud Rogers (GWAC-Citizen), Chelsea Durfey (GWAC), Dan McCarty (interested party), Dave Cowan (interested party), Dave Fraser (Interested Party - Simplot Agronomist), Donald Jameson (interested party), Doug Simpson (GWAC-Farmer), Frank Lyall (GWAC-Farm Bureau), Ginny Prest (GWAC-Dept. of Ag), Jean Mendoza (GWAC-Friends of Toppenish Creek), Jim Newhouse (GWAC), Kevin Lindsey (interested party), Kirk Cook (GWAC-WSDA), Laurie Crowe (GWAC-South Yakima Conservation District), Melanie Redding (Ecology), Mike Shuttleworth (interested party), Ralph Fisher (EPA), Ron Cowin (GWAC-SVID), Scott Stephen (interested party), Stuart Turner (GWAC-Turner & Co., Rosalio Brambila (interested party), Vern Redifer, Jim Davenport.

Meetings/Calls Dates

Meeting: Sunnyside Valley Irrigation District Office, 120 S. Eleventh Street, Sunnyside

When: February 10, 2016, from 1:30 pm to 3:30 pm.

Call: (509) 574-2353 – Pin # 2353

Participants

Jim Davenport (Meeting Chair), Vern Redifer, Troy Peters, Scott Stephen*, Kathleen Rogers, Doug Simpson, Frank Lyall, Jean Mendoza*, Larry Fendell, Jim Dyjak, Laurie Crowe*, Ralph Fisher*, Stu Turner, Ron Cowin, Dan McCarty, Anthony Dorsett, Jason Shab, Perry Beale, Gary Bahr, Bobbie Brady (Yakima County support staff)

*via telephone

Key Discussion Points

The meeting began at 1:37 PM. Jim Davenport informed the group that he would chair the meeting until the working group elected someone new per the agenda. However, first Jim introduced Gary Bahr from the Washington State Department of Agriculture (Kirk Cook's replacement) and asked the participants to introduce themselves to Gary and explain their connection and involvement in the GWMA.

Jim then asked the group to review the agenda and suggest any 1) additions and/or 2) revisions to the order. A member of the group suggested first that the group take a moment to honor Jim Trull. The group concurred and agreed Jim had been a gracious individual, caring above and beyond what was necessary, helpful and a people person. They acknowledged his influence on their lives and that he had done a great job guiding the Committee. The group expressed a desire

to publicly acknowledge Jim, his influence on each committee member personally and his influence on the GWMA. The group felt that a written or oral acknowledgement would be appropriate – perhaps a letter of condolence to the family for everyone to sign. It was then suggested that a letter of condolence and acknowledgment of Jim’s accomplishments be drafted and presented to Jim’s family. After additional consideration it was suggested that this be put on the GWAC agenda so that everyone could participate in this tribute. The committee was also interested in having a plaque prepared to present to Jim’s family. Jim Davenport asked Bobbie Brady (Yakima County Support Services) to explore this further and ensure they were considered for the February GWAC meeting.

The group returned to Jim Davenport’s initial question and reviewed the agenda and its order. A suggestion was made that No. 4 (Filling Vacancy of Chairmanship of Work Group) take place first. No additional agenda items were added.

Vacancy of Chairmanship

As meeting chair, Jim Davenport explained that the vacancy of the chairmanship would be filled from this Irrigated Ag working group committee. A vote would be taken in a “hold hands up” process. People from the group could volunteer or be nominated.

Stu Turner volunteered to take on the position. Jim Davenport asked Troy Peters and Jim Dyjak if either of them were interested in assuming the position. Troy Peters said he would accept the nomination if it were made, Jim Dyjak did not desire to be nominated. Jean Mendoza nominated Troy Peters. Jim Davenport and Vern Redifer declined to vote. A “hold hands up” (which included those conferencing in by phone) was then held. Troy Peters was elected by consensus. Troy asked Jim to chair the remainder of the meeting.

Review of the Third Round of Deep Soil Sampling

The next order of business was a review of the results of the third round of deep soil samples taken in the fall of 2015. It was agreed that Laurie Crowe would review with the group the revised handout Vern had distributed electronically that morning (a printed copy was also provided to the members in attendance). 60 fields – approximately 2,174 acres had been sampled. Many different kinds of irrigation systems were represented with varying crops and crop rotations. Most of the fields were new to the sampling. Where there were duplicates the fall samples were taken in differing parts of the field than they were in the spring. In three of the fields where test results were high in the spring, two of the samples were low this fall and one remained high. One member reminded the group that the goal of this testing was to get an overview – scale and scope examination not to learn the effect of current practices or the effect if you change practices.

Laurie told the group that the goal was to have 60 fields again in the spring for the fourth round of sampling. She believed that most of those fields would be new to the sampling process. She also let the group know that after the fall campaign there was \$209,906 left in the budget and assuming the cost for the spring sample would be similar to that of the fall sampling there would be approximately \$125,000 left after the spring soil sampling if the group chose to do a 5th sampling in the fall of 2016. Jim Davenport spoke up and let the group know that the RCIM Working Group would like to use some of the funds to sample more municipal locations but suggested that the group put this question on the back burner until the fourth sample survey was

completed this spring. Laurie responded and said that even if the group decided to do a fifth round of sampling there would still be approximately \$45,000 in funding remaining to accomplish the work the RCIM desired to do. Jim noted that that Ryan Ibach of the Yakima Health District was the new chair of RCIM as Bob Farrell had resigned from leading RCIM but would remain in the GWAC.

Discussion returned to the deep soil sampling report. Members looked at pastures tested, growers represented, consistency in production, variability in tonages, types of seed utilized, organic matter left in the field after harvest or pruning and their impact on the nitrate levels in the soil, legacy issues as they pertain to the history of the soil and its use, the effects of different cover crops, the effects of nitrogen uptake, level of water management proficiency today as opposed to years gone by, and organic matter benefits increasing the function of the soil and preventing runoff/leeching.

Discussion about Work Performed by Washington State Department of Agriculture on Nitrogen Loading Assessment and Review of IAWG Spreadsheet and Purpose Statement

Vern Redifer drew the group's attention to several overlay maps he had the Yakima County GIS group produce. GIS used calculations of the amount of nitrogen produced from various sources and transferred them into a density maps. Vern stressed that these were just examples for the IAWG to see and not meant to be conclusive. These maps could be prepared for differing sources and then superimposed over the top of each other through the GIS process and display the density from all sources. One member desired a map of this kind to be made for the permitted lands in the GWMA that receive biosolids. Vern stressed that the maps produced already were merely for illustrative purposes.

Perry Beale passed out several handouts to the group that were the work products of tasks assigned to the Department of Agriculture in their contract with Yakima County. The handouts summarized the spread sheets Perry had stored electronically which he would make available to the group. They included a Nitrogen Use Rate Collection Survey for Yakima GWMA. This was an anonymous phone survey. Their goal had been a 30 percent representation of each crop in the survey. Jim Davenport produced a copy of an IAWG spreadsheet that the group had been working on for a number of months which he distributed. This had been worked on mainly by Jim Trull with Scott Stephen's and Stu Turner's assistance. Jim believed this spreadsheet could provide supplemental information to Perry and should be integrated into Perry's work.

Perry explained that much of the data was derived from the day-to-day work already completed by the Department of Agriculture – they just added in the components the GWMA required. He drew the groups attention to the handouts he provided and gave a thorough explanation of the data contained on each chart together with a thorough explanation of each chart's corresponding legend so that the group was equipped with a good working knowledge of the work he had done. The group asked questions and discussion ensued. The group felt that Perry's work was a good first step and a good way to start. As a result it was concluded that Perry would refine and modify his work as follows: 1) include information gained from the third round of deep soil samplings, 2) look at published values that might provide better estimates of nitrogen release from organic matter; 3) integrate the information from Jim Trull's document – "Estimate of Nitrogen Usage for Agricultural Production in the GWMA" (including notations found in red made by Scott

Stephens), 4) conference with Scott Stephens and Stu Turner to review and refine the work and include a greater amount of data sourcing so the documentation clearly states the source of the numbers, methods and materials used; and, 5) take into account ranges by including in low/high calculations. Perry will complete this work and finalize the IAWG piece so that it was turned into the peer review committee by the end of the month. Vern explained that the Livestock/CAFO data and loading assessment is already to the peer reviewers (Melanie Redding, Ginny Stern and Nancy Darling) and the RCIM piece (done by Yakima County GIS) should be done and to the peer review committee by the end of February as well. He went on to explain that the purpose of the peer review committee was to aid in stream lining the process and to better establish the merits of each report. A member wanted to know if the reports would then proceed straight to the GWAC or if they would be presented to each committee first. Vern explained that it had been decided that each group would have a chance to review the reports generated by their committee before they were presented to the full GWAC which would again better establish the merits of each report.

Jim Davenport then asked the group if they had any further items to discuss also noting that Agenda Item No. 3 had become a subset of Item No. 2 in the discussion and, therefore, since there was no further discussion, the meeting was adjourned at 3:45 PM.

Resources Requested

- Jim Davenport to send to Perry Beale an electronic copy of Jim Trull's document, "Estimate of Nitrogen Usage for Agricultural Production in the GWMA."
- Ralph Fisher to speak with researchers at the University of Idaho to obtain published values from a four year study done on the Magic Valley to help estimate the ability of organic material to produce nitrates in a field and to better account for the ability for organic material to produce nitrates.

Recommendations for GWAC

- Prepare a letter and plaque acknowledging Jim Trull's accomplishments and contribution to the GWMA.

Deliverables/Products Status

Proposed Next Steps

Data Collection, Characterization, Monitoring

Charge from Groundwater Management Area Advisory Committee

A discussion of timelines and details regarding the Nitrate Loading Assessment

Working Group Members

Melanie Redding (Chair); Andres Cervantes; Bob Stevens; Charles (Pony) Ellingson; Charlie McKinney; Chelsea Durfey; Dave Cowan; Donald Brown; Doug Simpson; Elizabeth Sanchez; Eric Winiecki; Frank Lyall; Ginny Stern; Jaclyn Hancock; Jan Whitefoot; Jean Mendoza; Jennifer MacDonald; Jim Trull; John Van Wingerden, Kevin Lindsey; Laurie Crowe; Lino Guerra; Kirk Cook; Mike Shuttleworth; Ralph Fisher; René Fuentes; Robert Farrell; Ron Cowin, Scott Stephen; Sheila Fleming; Steve Swope; Stuart Turner; Dr. Troy Peters

Meetings/Calls Dates

Meeting: Thursday, January 14, 2016 10:00 AM

Call Number: 509-574-2353 pin: 2353#

Participants

Present: Melanie Redding (Chair)*, Ralph Fisher*, Gary Bahr*, Kevin Lindsey*, Pony Ellingson (PGG)* and Steve Swope (PGG)*, Jim Davenport, Steve George, Perry Beale, Jean Mendoza, Charlie McKinney, Jim Trull, Vern Redifer, Lee Murdock, and Bobbie Brady (Yakima County Support Staff)

*via phone

Key Discussion Points

Update on PGG Contract Work

Vern asked Pony Ellingson and Steve Swope to report on the progress they had made in designing an ambient groundwater monitoring system for the Lower Yakima Valley Groundwater Management Area. Steve informed the group that they had spent the last few weeks getting data into the GIF system and printing out maps. This work was now done. Over the next one to two weeks they would begin to select site locations, further develop the concept, and work on ordering the sites including an assessment as to the priority of their order. They anticipated that they would have this ready for the next Data meeting. Jim Davenport noted that the group had contracted with PGG to attend two meetings and inquired about the timing of those meetings and when the results would be ready for this group's review. Steve believed PGG would have a report printed and deliverable to the Data group by the March meeting for their review, input and questions. This meeting would be attended by PGG. The finalization of the work will depend on the modifications the group has for PGG and how long the group needs to work with the preliminary report, but it was his belief that that things could be finalized a month

or two later. Vern asked if they needed any additional information from the County or if they had any questions. Steve indicated that they had been working with a member of the County GIS group and had received everything they needed thus far and were able to fully update their systems.

Update on the Nitrogen Loading Assessment

Melanie advised the group that the peer reviewers had held several meetings to go over the Livestock/CAFO data and loading assessment. They were able to talk about their concerns and issues and have made quite a few comments. Kirk Cook and Kelly McClain from the Department of Agriculture will respond to those comments, which should resolve all of the issues noted by the peer review committee. At that point the report will be presented to this Data Collection group for review. While Melanie understood that many of the Data Collection Group were anticipating receiving that report sooner rather than later, she felt it was premature to discuss it at this time since the peer review committee was actively working with the Department of Agriculture to resolve the concerns and comments they had made. She felt it important to assure the group that just because the peer review committee wasn't discussing the report with the Data Group now didn't mean that those concerns weren't being addressed.

The IAWG and RCIM reports will be done the first part of February and then will begin the peer review process. A member wanted to make sure that the IAWG report would include the deep soil sampling information they had been procuring. Perry Beale said that they were using the data from the deep soil sampling information as one of their sources to reach the conclusions contained in that report.

A member asked if the reports would be given to the Data, IAWG and RCIM working groups first so that they had the opportunity to review and comment before the reports went to the full GWAC. After a short discussion, it was agreed that each working group would have a chance to review and comment on the report before it was sent on to the full committee since that would aid in stream-lining the process and also better establish the merits of each report.

A great deal of time was spent discussing the importance of the transparency of the reports and that the authors of each make sure to describe any assumptions when converting rough data into a useable format. They should also disclose whether or not their assumptions were scientific, personal opinion or professional judgment and specifically how and why each decision was reached. Standard methods of statistical application should be applied. Melanie also stressed the importance of making sure that the reports clearly state the source of the numbers used so that the groups don't have to make those inquiries when the report is received and no search for sources is necessary. She did not want the working group members to have to dig through each report to make those determinations. All three report author groups have already communicated so that the reports themselves will be written up in a similar manner.

Melanie reviewed for Gary Bahr (Kirk Cooke's replacement at the Department of Agriculture) the report process from report compilation through peer review to the working groups and on to the full GWAC in order to bring him up to speed. She noted that the peer review committee had

no ownership in the reports themselves but were charged with identifying technical issues and resolving them so that those problems weren't issues for the groups later and the working groups could focus on the conclusions and consequences of each report instead.

Upon inquiry, Gary confirmed that Kirk Cook is standing by to go over the comments made by the peer review committee on the Livestock/CAFO data and loading assessment report.

A member inquired as to whether there would be a report that includes atmospheric deposition and whether this issue would be addressed in any of the three reports presently under discussion or if this would be reported separately. A discussion ensued and it was agreed by the group that this topic should be produced apart from those already in process. They further agreed that studying atmospheric deposition and volatilization was crucial in order to better understand the atmospheric influence on the nitrogen content in the ground. While the influence might turn out to be minor, obtaining the data would clarify once and for all its impact. The group agreed that this endeavor was certainly worthwhile. As a result, Charlie McKinney committed to have conversations with his air program personnel at the Department of Ecology to inquire into what might be the applicable atmospheric rates of disposition and whether atmospheric disposition rates should be pinpointed field to field or over the general GWMA area. Charlie will email the group in the next week to let everyone know if he can get the information from his air program personnel. Vern committed that the County would process the rate values into GIS and get the appropriate calculations. Gary and Vern will work together to ascertain how the information will fit into a report.

Extension of Department of Agriculture Contract

Kelly McClain had contacted Vern about extending the performance period under the *Department of Agriculture contract with Yakima County*. After a discussion it was agreed that a four month extension to complete the report project might be appropriate since several milestones still need to be accomplished – reports to the peer reviewers with time to comment and reports to the work groups with time to comment. Gary and Vern will continue these discussions via email.

Miscellaneous

Melanie reminded the group that the peer review committee was going to tour a manure processing operation with Steve George in mid-February as per their discussion at last month's meeting.

The meeting was adjourned as 10:55 AM after it was determined that the group had no additional topics for discussion.

Resources Requested

-

Recommendations for GWAC

-

Deliverables/Products Status

-

Proposed Next Steps

- Charlie McKinney committed to have conversations with his air program personnel at the Department of Ecology to inquire into what might be the applicable atmospheric rates of disposition and whether atmospheric disposition rates should be pinpointed field to field or over the general GWMA area. Charlie will email the group in the next week to let everyone know if he can get the information from his air program personnel.
- Vern committed that the County would process the rate values into GIS and get the appropriate calculations.
- Gary and Vern will work together to ascertain how the information will fit into a report.
- Gary and Vern will continue discussions via email on the Department of Agriculture contract.
- March 10, 2016 meeting PGG will provide an ambient monitoring program report to this group.

Data Collection, Characterization, Monitoring

Charge from Groundwater Management Area Advisory Committee

A discussion of timelines and details regarding the Nitrate Loading Assessment

Working Group Members

Melanie Redding (Chair); Andres Cervantes; Bob Stevens; Charles (Pony) Ellingson; Charlie McKinney; Chelsea Durfey; Dave Cowan; Donald Brown; Doug Simpson; Elizabeth Sanchey; Eric Winiecki; Frank Lyall; Ginny Stern; Jaclyn Hancock; Jan Whitefoot; Jean Mendoza, Jennifer MacDonald; Jim Trull; John Van Wingerden, Kevin Lindsey; Laurie Crowe; Lino Guerra; Kirk Cook; Mike Shuttleworth; Ralph Fisher; René Fuentes; Robert Farrell; Ron Cowin, Scott Stephen; Sheila Fleming; Steve Swope; Stuart Turner; Dr. Troy Peters

Meetings/Calls Dates

Meeting: Wednesday, March 9, 2016, 10:00 AM

Call Number: 509-574-2353 pin: 2353#

Participants

Present: Melanie Redding (Chair)*, Gary Bahr, Laurie Crowe*, Jim Davenport, Steve George, Jean Mendoza, Ginny Prest, Vern Redifer, and Bobbie Brady (Yakima County Support Staff)

*via phone

Key Discussion Points

Chair, Melanie Redding, opened the meeting at 1:05 PM. Several members commented that they enjoyed having the meeting changed to the afternoon of the second Wednesday of the month (rather than the second Thursday of the month) since the Regulatory Working Group meeting was held in the evening on the same day. They found the timing to be more convenient as it allowed them to attend two meetings in a short period of time rather than two meetings on two consecutive days. This made it especially convenient for those who had to travel from the west side of the State. All of the members in attendance were open to making this a regular schedule. It was agreed to inquire of those absent members to see if the meeting date and time could be changed permanently.

Melanie also informed the group that she was calling in from her home because a fire alarm had gone off at her place of employment requiring her to exit the building. Unfortunately, in her haste she had neglected to bring the Working Group file with her which meant she would need to provide information to the group on the status of various reports from memory.

Update on the Nitrogen Loading Assessment

Melanie let the group know that the three members of the peer review committee had finished their review of the Nitrogen Loading Assessment report on livestock. Melanie is currently waiting for the electronic comments to come in from her fellow peer reviewers and she will forward them on to the WSDA for a response.

In addition, Melanie had just received the piece for irrigated agriculture. The report has been sent to the peer review committee who will get to work on it right away. The committee was still waiting for the report on RCIM from the County. (NOTE: The County was given a new task to add to this report later on in the meeting, which may affect the timeline of its completion a bit).

Melanie reiterated that the greatest challenge continues to be the application of the same methodology on all three reports that are being produced by three different authors. This is an issue the peer review group is addressing as they respond to the authors as they review each piece.

Melanie hesitated to give the group a time frame for the completion of the draft reports as there are lots of moving parts. Melanie (like the committee) wants it done, but her priority is that it be done well with good numbers - everyone is doing the best they can. She will give the finished reports to the working groups at the same time.

A member asked Jim Davenport if he would be able to complete the area characterization or if he would need to wait until the nitrogen loading assessment reports were complete. Jim said he could finalize the area characterization report without the nitrogen loading assessments, but felt it would be better served if he waited for all of the information. A member voiced their concern about time frame and about being underfunded and under resourced. Melanie responded and emphasized she was trying to foster the completion of each report in the most efficient manner but challenges keep popping up. She also felt the group was doing the best possible job with what they had to work with.

Melanie went on to state that she continues to feel it is important that each report provide a range of numbers – high, low, mean and median. She is also concerned that atmospheric deposition calculations have been applied to some sources but not to others in the reports already received. She explained that the reviewers want direction as to how to handle this consistently. One thought had been that the matter of atmospheric deposition could be pulled out from the reports entirely and dealt with as an issue on its own. That way it could be factored back in to each source in the same manner and allow for greater continuity.

Jim Davenport addressed member Jean Mendoza regarding the material she had sent to several members on atmospheric deposition in response to the draft spreadsheets she had received from Perry Beale as part of his work on the irrigated ag piece of the Nitrogen Loading Assessment. Jim wanted to know where the material had come from – Jean responded and said it was information on studies done in both Whatcom County and California. Melanie indicated she had also received the information from Jean and thought it provided good background information.

Another member pointed out that there should be some set parameters when choosing study data for atmospheric deposition, i.e., studies done in areas with similar climate conditions. The concern was that the material provided from Whatcom County would not be applicable as the climates are too dissimilar – the temperatures differed too greatly which would cause differing rates of evaporation. The member went on to suggest research done in climates like San Joaquin, California, because of the similarities which might produce numbers similar to the GWMA. Temperature, time of year and moisture are all variables that need to be factored in. The member went on to say, however that the County could take the information Jean had provided and do a literature search from that information then apply the numbers found.

Vern suggested that atmospheric deposition be pulled out of all three of the pieces being written for the Nitrogen Loading Assessment and handled as a separate topic. He volunteered the services of Yakima County to process the data as part of the RCIM piece. A member asked Vern if his staff was competent to come up with an appropriate number. Vern explained that while none of the staff had the scientific expertise to determine the appropriate rate of atmospheric deposition in the GWMA, he did have a very competent research staff member that could search out studies that would provide the County with the scientific information needed to process the data. The research staff would then run a low, high, mean and median number and provide explanation and reference for each. Vern went on to explain that he was concerned that the percentage of nitrogen attributable to atmospheric deposition in the GWMA was low. Therefore, he felt due diligence would be best served by allowing the County staff to research the topic. He did point out, however, that if the number turned out to be higher than originally thought, the working group could choose to take a closer look and perhaps choose to pursue other avenues of research and/or study. His thinking was that if the researchers did good work up front it would allow the working group to see if the numbers varied enough to dig deeper.

Melanie thought this was a good idea and was also not sure that an expert was required at this point to perform the task. She felt that what Jean had submitted had given the group good references and information that was consolidated and provided a good start for the research Vern had described and volunteered his employees to do. Melanie didn't feel the group necessarily needed someone's testimony, but did require published data. The County, in its RCIM report, would be required to present in detail how, where, why, and from whom they came up with any numbers they used in each of the ranges. Not only would the peer reviewers be able to confirm the authenticity, but since the reports were going to be presented to the working groups each member would then also have the ability to see the decisions that were made and compare it with the information they have to decide its validity. At that point the working group could determine if more research would be needed and it would allow the GWAC to better allocate its resources.

A member voiced concerns about the cost billed by the County to the GWMA for this additional research and that the percentage of contribution to the nitrate levels from atmospheric deposition might be greater than the group thought. When asked by the working group what the member thought the percentage might be they stated three (3) percent. Several members indicated that they did not feel this was a significant contribution and therefore it would not warrant spending a great deal of money on or pursuing in depth. Jim Davenport said he thought that if the contribution atmospheric deposition made toward the nitrate level was three (3) percent he did

not foresee a lot more money being invested in further study. However, if the number did in fact turn out to be much larger the group could look at it and consider spending money specifically in that area at that time.

Vern also addressed the cost for the County to research this topic and indicated that he felt Yakima County could use a great deal of information already available to them through the Census Bureau and GIS literature. He did not feel that this would be that large of an endeavor. He also explained that the County only charged the GWMA for its hourly employees – the time for the salaried employees was merely integrated into their already existing work time. Another member spoke up and said that more money was being donated to work for the GWMA than what was being billing out. Vern agreed this was true for the County and he thought it was probably true for the Department of Agriculture as well.

A member spoke up and said he appreciated Vern's idea and offer. It was agreed that the County would work through the information and studies already done and come up with a range of numbers. They would document their findings thoroughly. All of this would be added to the RCIM report and go through the peer review process for quality assurance. At that time it would be presented to the working group and the working group could respond.

Update on the Ambient Monitoring Network

PGG is working on this and will update the group possibly at the next meeting. Vern thought that PGG was close to describing the recommended locations.

Other Issues

A member inquired as to whether anyone was looking into subsurface drains when doing the nitrogen loading assessment. It was suggested that the issue be raised this evening at the Regulatory Working Group meeting since Ron Cowin from SVID was speaking on irrigation districts and the collection of groundwater. Another member voiced concern as to whether this was a source or a conveyance. Vern indicated Mike Martian of GIS could help with this. He would need to know where the drains are in order to plot them and questions answered as to volumes, dilutions, and conveyances to surface water. If this information was assembled Mike could plot this and look at it with an overlay map to see if the drains are transporting water to other locations. All drains were converted and are managed by SVID who uses them as return flows to remove excess irrigation water.

A member asked if they had done testing on turbidity and sediment transport – Jean will check into this as well at this evening's Regulatory meeting. This will allow the group to determine if they need to consider these as a source in the Nitrogen Loading Assessment.

The information we need from Ron Cowin is: what information do you have on mapping, water quality sampling and flows as it pertains to subsurface drains and also whether this was a source or conveyance.

Chair, Melanie Redding adjourned the meeting at 2:20 PM

Resources Requested

-

Recommendations for GWAC

-

Deliverables/Products Status

-

Proposed Next Steps

Regulatory Framework Working Group

Charge from Groundwater Management Area Advisory Committee

[Insert Charge]

Working Group Members

Jean Mendoza, Chair (Friends of Toppenish Creek), Andres Cervantes (Department of Health), Charlie McKinney (Department of Ecology), Chelsea Durfey (Turner and Co.), Dan DeGroot (Yakima Dairy Federation), David Newhouse (interested party), Ginny Prest (WSDA), Jason Sheehan (Yakima Dairy Federation), Jim Dyjak (Concerned Citizen of Yakama Reservation), Larry Fendell (interested party), Laurie Crowe (South Yakima Conservation District), Nick Peak (EPA), Patricia Newhouse (Lower Valley Community Representative), Steve George (Yakima County Farm Bureau), Stuart Crane (Yakama Nation), Sue Wedam (Lower Valley Community Representative), Vern Redifer (Yakima County Public Services), Jim Davenport (Yakima County Public Services)

Meetings/Calls Dates

Meeting: January 13, 2016 5:00pm – 7:30pm

Call Number: 360 407-3780 PIN Code: 306589#

Participants

Present: Jean Mendoza (Chair), Jim Davenport, Laurie Crowe*, Larry Fendell*, Jim Dyjak, Charlie McKinney, Steve George, Dan DeGroot, Ginny Prest*, Vern Redifer, and Bobbie Brady (Yakima County Support)

*via phone

Key Discussion Points

The meeting was opened by Chair, Jean Mendoza, at 5:05 PM. Jean noted that in accordance with the Agenda she had three goals for the meeting. The first was to have each member state what they would like to see happen as the committee moves forward. Her next goal was to review what the GWMA specifically said the committee should accomplish. And lastly, it was her desire to put together a plan and set goals based on the previous two discussion items. Jean took a moment to let the committee know that several members had sent emails in response to the agenda. In addition, Jim Davenport and Vern Redifer brought a chart (36" x 44") that had been prepared by Jim which was hanging on the meeting room wall. Each of the members would discuss these written responses when the group discussion began. (Please note: The chart brought in by Jim and Vern could not be replicated for the group in electronic form due to the size prior to the meeting. The words in each column could only be read on the screen by clicking on that particular column, but the impact of the chart was found not only in seeing what was written, but also in the columns left blank, as they indicated where particular laws/regulations applied to

particular nitrogen sources, or not.. The chart is available at present at Yakima County Public Services and can be viewed by any member upon request. An electronic copy will be provided to the members as well. Further discussion about the chart is contained below as part of the group's discussion). Vern also supplied the committee members with an 8-1/2" x 11" summary of the chart. However, this summary conveys the written blocks from the larger chart but none of the open blocks. The format was reworked as well to reduce the size and thus provide the content to the committee members. It will be scanned in by the County and available to all members in electronic format.

Discussion – Part I

Jean Mendoza read Section 3.1 Problem Definition – Define Existing Regulatory Framework Within the GWMA Boundary and Section 3.2 Evaluate Existing Regulatory Framework of the GWAC Work Plan Regarding Regulatory Framework. When she finished she noted that she felt the group was off to a good start on 3.1 but she did not see a plan for the evaluation required in 3.2 and was concerned that it had not been formulated to date.

The entire group was then invited to share their thoughts and observations. Those are summarized as follows. The plans and goals that were derived from this discussion are included in Part II of this summary.

1. At Jean's request Vern and Jim Davenport shared first about the charts and summaries they brought to the group that evening. Jim explained that the chart was a way of providing the group with a framework of the laws/regulation now in effect – a summary of the laws as they pertained to each source of nitrogen within the GWMA. The laws and regulations are noted on the "x" axis (on the top row from left to right). The sources of nitrates are listed on the "y" axis (in the left column from top to bottom). The laws and their language are in the corresponding cells where the x and y axes intersect. What Jim found of particular interest were the open cells between nitrate sources and corresponding regulations. This "gap analysis" makes clear the extent and absence of regulatory coverage.
2. Vern broke Jim's chart down and put it into an 8-1/2" x 11" format. This format lists each nitrogen source in sequence with the legal information beneath it. In the left hand column beneath it, applicable regulations and citations were included. All of the words in italics were Jim's descriptions of those regulations, taken from a longer, "treatise" type description of them. In the right hand column beneath the nitrogen source, Vern provided that information from Jim's chart that describes how the law/regulation operates. The content of this "smaller" version is identical to the charts provided by Jim, however, it was assembled in a different format so it fit better on smaller pieces of paper. The only other difference is that there are no blank spaces – again to allow the content to fit into a smaller format. This does not help with the "gap" analysis (since you can't see the gaps in this format) but it does allow each member to be able to read what was written.

The group held a discussion regarding the content of the chart and its summary. One member noted that there was nothing under atmospheric deposition and wondered if the

Clean Air Act addressed this. It was agreed by the group that this should be quantified and looked into some more.

A member voiced concern as to who would be responsible to enforce any new regulations.

3. As the member roundtable discussion continued, concern was voiced that it was imperative for the committee to understand each group's regulatory roles. This member felt it was necessary that the group re-visit the regulatory roles of each governing agency. If necessary, he felt that the group should bring back selected agencies for further clarification. In addition, he thought the group should look at how California bundled funding with regulatory guidelines for a greater impact.
4. Next, Charlie McKinney discussed the contents of his email to Jean. He explained that Section 173-100 of the WAC directed the group to come up with a set of recommended solutions that would be effective. He believed, however, that in addition to regulatory solutions it was imperative for the group to look at and be open to alternative solutions, i.e., incentives, education, or other alternatives and that the group had a responsibility to be open to alternative solutions when they were more effective than regulations. His thought was that the group should look at alternatives and how those alternatives could be narrowed down into actual recommendations. Any alternative recommendations would require solid rationale or be left on the table. He did believe that after seeing Jim's chart tonight that this method might be a good way to fill in the gaps. However, he also cautioned that he didn't think the group could do this until the source of the problems were clearly defined through the various reports and studies that were yet to be completed by the other GWAC committees.
5. Another member spoke up and added the following comments to Charlie's alternative method approach. He felt that the group should look at the regulations outlined in Jim's chart and then define their effectiveness and communicate this back to the GWAC. He believed the chart would include a list of pros and cons of the alternatives as well. This would provide the full GWAC with the building blocks to get it started on the final process and would be an informative tool to provide to the GWAC. Charlie McKinney added that a matrix of alternatives could be fashioned by this group. Then the group could solicit input from other groups like RCIM, Livestock/CAFO and Irrigated Ag for any alternatives those groups would recommend. At that point the alternatives could be refined. Charlie offered to fashion such a matrix.
6. Another member spoke up and pointed out that he saw the WAC as a checklist. The starting point was Section 3.1 and each source that might affect the ground water supply. He expressed that he felt the group had failed to study each source adequately. Examples of missing elements in his opinion were: irrigation water, large on-site septic systems, mining, and abandoned, poorly constructed wells. He did feel that Section 3.1 was mostly done but that the group hadn't finished Section 3.2 and that the group needed to proceed in an orderly fashion through the WAC until each item could be checked off.

When another member voiced a concern that the group would proceed in this manner GWAC would get to October 2017 and not have had sufficient time to properly analyze and set forth solutions and therefore, not get the entire job done, he responded that he found the most efficient way to proceed was a methodical accomplishment of goals as outlined in the order in which they were set forth. He also felt the method brought about unity. Once this methodical approach was done the information could be disseminated to the various work groups so that they could look at alternatives which would enable this group to fill in the gaps on Jim's chart as suggested earlier.

7. Again, a member pointed out that it would be good to see the results of the nitrogen loading assessment because it should illuminate areas that were in the greatest need to be addressed and allow the group to direct its focus.
8. Ginny Prest from the Department of Agriculture informed the group that the report to the legislature regarding the nutrient education project would be available soon. She will send Yakima County support personnel a copy so that it could be made available to the group. The nutrient education report (also called the proviso project report) includes an effort to identify gaps in regulation regarding land application of manure and the GWMA Regulatory Framework Workgroup may help contribute to that effort.
<http://agr.wa.gov/FoodAnimal/Livestock-Nutrient/>
9. Another member brought up the topic of technology upgrades. It was his opinion that past issues were being addressed/solved by new technology and new methodology. An example was drip and sprinkler irrigation as opposed to flood irrigation. Another example was the application of fertilizer at agronomic rates. The committee voiced a desire to hear a presentation on the improvements made in technology – those currently on the market and those concepts due out in the near future. This would allow the group to gain a better understanding as to how technology could help everyone make the changes that need to be made and might possibly have a position in the alternative matrix being proposed.
10. Lastly, a member voiced concern that the group might need to consider regulating the number of cows in Yakima County. She reasoned that it was the most cost-effective solution to the problem. It was her desire for the committee to approve the hiring of some law students to look at communities who had taken this action and do a cost/benefit analysis of the potential lawsuits that ensued vs. the cost of public health. Vern pointed out that a self-limiting system (dairy nutrient management plan) was already in place and while it did not set a limit on the number of cows it did preclude an entity from having more cows than they had the ability to process waste in a proper manner. Therefore, to the extent cows are a part of the problem – a regulatory solution already existed. He also wondered about the practicality of limiting the number of cows in the County and just how that could be done. A few of the members discussed that while the dairy nutrient management plan did in fact exist, the governing of this regulation was still evolving. Vern pointed out that he still felt this was a better management plan as it does give the governing authority the ability to say nutrients must be applied agronomically. He saw limitations in a plan that would govern the number of cows as it still might fail to solve

the issue if someone didn't manage how the nutrients were applied or if the nutrients were applied correctly, but the land was overwatered. Jim Davenport agreed but suggested both solutions would be difficult to monitor. Another member added that technology for manure handling and feed continues to improve and will also help with this issue.

At this point the group's roundtable discussion was complete and they took a small break before continuing the discussion by assembling a plan and goals.

Plan and Goals – Part 2

The group agreed that they needed to assemble a list of items for further review which is as follows. Prior to the meeting with the groups they desired to write out a list of questions for the agencies:

- Irrigation, chemigation, fertigation (BJOC, ROZA, Sunnyside Irrigation District)
(Please Note: WSDA has a fertilizer and chemigation program per Ginny Prest)
- Mining
- Atmospheric Deposition
- Large On-site Septic Systems (who can do this?)
- Energy Tax Credits – how they influence policy and how they relate to climate change
- Technology – how it solves the problem and how regulations may inhibit technology
(regulations should be technology drivers)

It was agreed to dedicate the next meeting to going through the checklist, seeing if there are other groups the committee would like to hear from and estimating how long it will take to get through the items. It was agreed that Jean Mendoza will get a presenter or two for the next meeting as well.

The committee discussed the meeting date and time for the next year. All agreed that the meeting date (second Wednesday of the month) and location (Department of Ecology) worked well. However, it was the consensus of the group to change the time to 3:00 PM to 5:30 PM. The chair desired to do another doodle poll to see if this new time was acceptable, but the group's opinion was that the people at this meeting were those that consistently attended and their desires should come first.

Meeting adjourned at 7:40 PM.

Resources Requested

- Ginny to send link to Nutrient Education Project report
<http://agr.wa.gov/FoodAnimal/Livestock-Nutrient/> and EPA Region 3 Chesapeake Study from Maryland for distribution to the group. (Attached)

- Jim Davenport/Vern to provide the group with an electronic copy of the chart and summary they developed. (Attached)
- Charlie McKinney volunteered to fashion a matrix of alternative solutions that would allow for the input of other groups like RCIM, CAFO and Irrigated Ag as to the alternatives they would recommend as well.

Recommendations for GWAC

-

Deliverables/Products Status

-

Proposed Next Steps

- Next meeting: The group agreed to continue to meet on the second Wednesday of each month at the Department of Ecology but the group recommended that the time be changed to 3:00 PM ~ 5:30 PM. Jean Mendoza desired to send another Doodle Poll but was open to the change.

Regulatory Framework Working Group

Charge from Groundwater Management Area Advisory Committee

[Insert Charge]

Working Group Members

Jean Mendoza, Chair (Friends of Toppenish Creek), Andres Cervantes (Department of Health), Charlie McKinney (Department of Ecology), Chelsea Durfey (Turner and Co.), Dan DeGroot (Yakima Dairy Federation), David Newhouse (interested party), Ginny Prest (WSDA), Jason Sheehan (Yakima Dairy Federation), Jim Dyjak (Concerned Citizen of Yakama Reservation), Larry Fendell (interested party), Laurie Crowe (South Yakima Conservation District), Nick Peak (EPA), Patricia Newhouse (Lower Valley Community Representative), Steve George (Yakima County Farm Bureau), Stuart Crane (Yakama Nation), Sue Wedam (Lower Valley Community Representative), Vern Redifer (Yakima County Public Services), Jim Davenport (Yakima County Public Services)

Meetings/Calls Dates

Meeting: February 17, 2016 3:00 PM – 5:30 PM

Call Number: 360 407-3780 PIN Code: 306589#

Participants

Present: Jean Mendoza (Chair), Jim Davenport, Laurie Crowe, Larry Fendell, Jim Dyjak, Charlie McKinney, Dan DeGroot, Ginny Prest, Vern Redifer, David Newhouse, Patricia Newhouse, Stuart Crane, Jason Sheehan and Bobbie Brady (Yakima County Public Services Support Staff)

*via phone

Key Discussion Points

Jean Mendoza, Chair, opened the meeting at 3:05 PM. There was no one present via the conference call line. She reminded the group that they had decided at the last meeting to complete their review of all sources of nitrogen before analyzing the regulations and therefore she was going to ask Ron Cowin from SVID (Irrigation, chemigation, fertigation) and Phil Rigden of the Yakama Nation (Tribal Law/Natural Resources) to make presentations at next month's meeting. The group also saw a need to learn more about commercial fertilizer. Jim Davenport had done some investigation into this since last month's meeting and provided the group with a copy of his notes during the meeting.

The group then acknowledged that Charlie McKinney (Department of Ecology) was retiring and this would be his last meeting. They thanked him for sharing his expertise and for his assistance in the work of the Regulatory group.

Surface Mining Presentation (Charlie McKinney)

Charlie passed out a “Fact Sheet for the Sand and Gravel General Permit” dated September 9, 2015. He explained to the group that every permit issued by the Department of Ecology has a fact sheet that provides background and detail for the permit. The brand new Sand and Gravel Fact Sheet went into effect today (February 18, 2016). Charlie had copied several pages of the full fact sheet because he felt it provided good information for the group. He explained that permits are required because there are a lot of human activities that produce waste or discharge. Rather than prohibiting an activity a permit is issued to manage how the activity is done. The permit will include monitoring requirements so that discharges and/or pollution levels do not exceed the standards of the State of Washington Water Quality Standards.

The Department of Ecology issues two types of sand and gravel permits: 1) a general permit; and, 2) an individual permit. A general permit is issued when there is a group of operations with commonalities and it is more of template approach. Examples of this would be sand and gravel permits, CAFO permits, and fresh fruit packing permits. Individual permits are issued where there are unique characteristics involved. Commonly this would apply for example to municipal waste water treatment plants.

Section 3.1 gives an overview of the number of facilities covered under the sand and gravel facilities in the State. Charlie added that there are 175 sand and gravel facilities in the Central Region and the number in the GWMA was more than 5 but less than 25. Page 7, Figure 1, is a graph with approximate percentages of permittee activity types – the greatest percentage is Construction Sand and Gravel Mining (40%). Charlie next directed the group’s attention to Section 3.2.1 Storm water. Page 8 disclosed three types of storm water. Type 1 is when storm water falls on undisturbed, natural areas, or completely reclaimed areas. Type 2 is when storm water falls on a portion of a site that has been disturbed and Type 3 is when storm water falls on the part of the site where manufacturing, processing, active storage or mining takes place. Section 3.2.2 explains that most mining-related facilities use some water to mine, process, handle or transport mined material and that this water is categorized as “process water.” There also may be water from washing truck or machine tires so that there is no track out of materials from the site.

A member asked where nitrates might factor into this. Charlie explained that nitrate and nutrient percentages were very minor to surface mining. The “Fact Sheet for the Sand and Gravel General Permit” [which is reporting on sand and gravel permits statewide], Table 3 “Approximate Number of Effluent Violations during the 2010 Permit” lists 68 nitrate and nitrite violations from October 1, 2010, to August 1, 2015, or 14 percent of the total (the third most sited issue). The fact sheet also explains that since the Sand and Gravel General Permit went into effect in 1994 there has been a large decrease in the number of numerical effluent violations.

Charlie directed the groups’ attention to page 9 of the report, Table 1: Potential Pollutants and Sources at Sand and Gravel Facilities and reviewed the list of contaminants and their sources. A member desired to know if it was possible to monitor for these contaminants. Charlie indicated that the water must be caught in a lined lagoon to allow the turbidity to settle out before allowing the liquid to be dispersed.

Charlie pointed out to the group that the remainder of the handout contained information on how the permit has been functioning. On page 16 under Permit Conditions Charlie explained that

all permits have these. The conditions are requirements and dictate how people must operate within the context of the permit. They include a spill control plan, monitoring, plan, etc. Charlie noted that the ensuing pages contained a number of graphs and charts including a graph that shows that in the last ten years the number of pH violations has been reduced by approximately 50 percent since the sand and gravel permit was developed. Charlie also pointed out that all facilities would be required to obtain other permits and maintain other standards, i.e., a SEPA determination, clean air permit, reclamation plan from the Department of Natural Resources.

A member asked what happens when a mine plays out. Charlie responded by pointing out that reclamation requirements were contained in the permit. Vern noted that some mines become lakes or fishing ponds. He also pointed out that Yakima County mines at the Shane Landfill. Since the landfill is situated on rock, the County first mines the rock which creates holes to deposit the landfill. The mining produces rock for concrete and salt for roads. Another member inquired as to whether anyone ever farms on reclaimed mining property. Vern said probably not here as most mining operations create either a hole in the ground (which would require a great deal of topsoil to bring it up to grade) or are cut into a hill. Charlie added that on the west side of the State some mines have become parks and top soil is in fact brought in. Another member thought that there was a park in Sunnyside which was built on a former mining site.

Vern wanted to confirm with Charlie that this kind of fact sheet was available for all permits. Charlie said yes and noted that the fact sheets were a quick source of information and were available on the Department of Ecology website for public viewing.

A member asked how violations are detected. Charlie said by reporting, resulting from an inspection or a public complaint. Companies are required to complete Discharge Monitoring Reports (DMR's). 70 percent of these are completed electronically. If the Department of Ecology then sees something on a DMR that seems out of place they will then notify the company and help them to determine the source of the problem and help them provide a solution to fix the problem. The company will receive a Notice of Violation if they do not respond to these initial inquiries.

Charlie next drew the groups' attention to three handouts all of which were printed from the Department of Ecology's website:

1. Stormwater Pollution Prevention Plan (SWPPP): this is required by the Sand and Gravel Permit. All permits include a list of specific items that must be included in the SWPPP including a site map, inventory of materials, source control BMP's (best management practices), stormwater treatment and stormwater inspections.
2. Sand and Gravel Permit Limits and Monitoring which explains that the permit sets a pH limit for ground water discharges and limits turbidity, total suspended solids, and pH in surface water discharges. The permit also limits total dissolved solids in discharges of process water from concrete batch operations. Charlie noted in particular that discharges to surface water or ground water must be within the range of pH 6.5 to 8.5.
3. Erosion and Sediment Control Plan: This is a requirement for a Sand and Gravel Permit and requires the permittee to develop, maintain and comply with their erosion

and sediment control plan as a part of the Site Management Plan. It must include *stabilization and structural practices*

During the last moments of his presentation Charlie passed around the Sand and Gravel General Permit for the committee's review.

He noted that there are fairly well established BMP's. The Washington Eastside Stormwater Manual is updated every two years. It contains a list of the BMP's to choose from and what they are appropriate for. He also pointed out that while a Sand and Gravel permit has a five year expectation, other permits have more frequent inspection periods.

Wastewater Applications Presentation (Charlie McKinney)

Charlie presented to the working group a power point display entitled "State Waste Discharge Permit Program, WAC 173-216 RCW 90.48 - State Water Pollution Control Act."

The purpose of this was to implement a permit program covering discharge of waste material from three sources – industrial, commercial, and municipal into surface and ground waters of the State (dual objective/dual permitting process meant to satisfy the permit requirements under RCW 90.48). Some groups need a single permit and some require a hybrid permit, i.e., NPDES plus SDP. It does not apply to:

- Point source discharges to navigable waters (NPDES program). Can have hybrid permits: NPDES plus SDP;
- Those covered under General Permits;
- Domestic dischargers to municipal sewer systems; and,
- Other dischargers to municipal systems in certain situations.

Prohibited discharges are dangerous wastes (173-303) and various discharges to municipal sewer systems that would cause problems to the system.

Application requirements are public notice, potentially a public hearing and plans and specifications must be approved.

Permits and conditions shall specify conditions necessary to prevent and control waste discharges to waters of the State; AKART (All Known and Available Reasonable Treatment – general accepted AKART methods); pretreatment requirements; any conditions necessary to meet water quality standards or protect beneficial uses (i.e., fish), appropriate monitoring, reporting, record keeping (specific quality control requirements), compliance schedules, fixed term – not exceeding five years, right to enter by the department, permittee responsible for proper operation and maintenance, non-compliance actions and notifications.

Charlie noted that the Port of Sunnyside is a good example of a hybrid permit. Their main purpose is water treatment – they discharge to SVID drains and have a land application. The group discussed the requirements, the issues the Department of Ecology will monitor, monitoring methods and inspections.

The group wanted to know if the Department of Ecology performs regular inspections or if they depend on reports coming in. Charlie said that each permit notes the time frame of inspection – for a sand and gravel permit it would be once every five years minimum. A State Waste Discharge Permit would be more frequent. Additionally, the Department of Ecology sets goals of how many inspections an inspector is expected to do. Inspections will also be precipitated by the reports coming in. These can be planned or unannounced. They are routinely announced but could be unannounced if there is an issue in the DMR that has been left unresolved or a complaint has been made.

The group then asked what happens when a report comes in. Charlie explained that the permit unit has monthly meetings where they look not only at the reports that have been turned in but also whether or not the filing of a report is overdue. They will specifically look at whether the permittee is within the specified limits of the permit – if not the report will be flagged and if it stays that way it will be identified as a trend. If the permittee is not necessarily bad or negligent, but not making efforts to comply then the permit group will go farther. Every report is fully read by specialists in that industry – people who know the processes. This can trigger a phone call, meeting or an inspection.

Vern noted that this is true for the Buena plant – the County is held to these same standards. They have had no violation for quite some time. If, however, the County saw something that they thought caused an issue – they would put it in their report with the numbers. Buena has gone through five different permits because things change with time and standards are raised and must be complied with. Vern was asked how often Buena was inspected. He didn't know for sure but thought it may be every one and a half years.

Atmospheric Deposition Presentation (Charlie McKinney)

Charlie reminded the group that he had already emailed the information he received on this and did not have much more information to provide. He believed this was something the Data Working Group needed to look into further. Vern reported that he had obtained information on the National Atmospheric Deposition for the United States but had not offered this information to this group as what the State had was more specific to the GWMA region. The Mount Rainier Site total was 1 to 2.5 almost pounds per acre. Jean indicated that the group may come back to this topic at a later date.

At this point the group took a short break.

Matrix and Spreadsheet for Analysis of Regulations

Jean passed out a document she had prepared entitled “A Proposed Road Map for the GWMA Regulatory Work Group.” She drew the working group’s attention to the back page “proposed goals and objectives” and read through it. She informed the group that her goal for the remainder of the meeting was to dialog as to how the group should go forward and considered this document a potential road map for the GWMA Regulatory Working Group. The group discussed the document Jean had prepared at great length and reached the following conclusions:

1. These proposed goals and objectives were not a part of the original work plan as outlined in Section 3.0 of WAC 173-100-100;

2. The group had spent a great deal of time working out Sections 3.1, 3.2 and 3.3 of WAC 173-100-100 and held a concern that the group was moving away from its original plan.
3. Sections 3.1, 3.2 and 3.3 provide the group with a check list and the group should just stick with that.
4. Sections 3.1, 3.2 and 3.3 keep the group coordinated with other groups and will keep the groups from going in different directions. They felt this was especially important since the GWAC would have to take the reports of each working group and integrate them together.
5. Sections 3.1, 3.2 and 3.3 does provide a list of measurements that help determine the timely progress of the group.

Therefore, it was the consensus of the group to stay the course with the work plan as defined in Sections 3.1, 3.2, and 3.3 and did not adopt the "Proposed Road Map for the GWMA Regulatory Work Group" as presented by Jean.

Regulatory Work Group Plan for 2016

The group then discussed its next steps which are as follows:

1. Finish up the presentations on various regulation topics at next month's meeting as noted in the first section above.
2. Individuals to consider what gaps they believe exist and present those to the working group.
3. Decide at what point the group has enough information so that it can turn the corner to focus in on perceived issues (things that could be better).
4. Consider the need to move forward on these issues as other groups are expecting regulatory direction/insight from this group.
5. Any additional questions about existing regulations could be sent to the original presenters for clarification rather than spending more time inviting speakers to make additional presentations.
6. Perhaps complete a historical timeline of the regulatory framework regarding nitrate impacts to groundwater in the Lower Yakima Valley GWMA which would be included with the Regulatory Working Group report.

Meeting adjourned at 5:50 PM.

Resources Requested

Recommendations for GWAC

Deliverables/Products Status

Proposed Next Steps

Regulatory Framework Working Group

Charge from Groundwater Management Area Advisory Committee

[Insert Charge]

Working Group Members

Jean Mendoza, Chair (Friends of Toppenish Creek), Andres Cervantes (Department of Health), Charlie McKinney (Department of Ecology), Chelsea Durfey (Turner and Co.), Dan DeGroot (Yakima Dairy Federation), David Newhouse (interested party), Ginny Prest (WSDA), Jason Sheehan (Yakima Dairy Federation), Jim Dyjak (Concerned Citizen of Yakama Reservation), Larry Fendell (interested party), Laurie Crowe (South Yakima Conservation District), Nick Peak (EPA), Patricia Newhouse (Lower Valley Community Representative), Steve George (Yakima County Farm Bureau), Stuart Crane (Yakama Nation), Sue Wedam (Lower Valley Community Representative), Vern Redifer (Yakima County Public Services), Jim Davenport (Yakima County Public Services)

Meetings/Calls Dates

Meeting: March 9, 2016, 5:00-7:30 PM

Call Number: 360 407-3780 PIN Code: 306589#

Participants

Present: Jean Mendoza (Chair), Jim Davenport, Sanjay Barik, Larry Fendell, Ginny Prest, Andre Cervantes, Dan DeGroot, Stuart Crane, Jason Sheehan, Sue Wedam, Steve George, and Bobbie Brady (Yakima County Public Services Support Staff) Guest Presenters: Ron Cowin, SVID, and Phil Rigdon, Yakama Nation. No one was present by phone

*via phone

Key Discussion Points

Chair, Jean Mendoza, opened the meeting at 5:00 PM. She introduced both speakers as noted above and then asked everyone present to introduce themselves.

Presentation by Ron Cowin SVID – Rules & Regulations that Apply to Irrigation Districts

Ron indicated that he has worked for the District for 13 years and that RID (Roza) and SVID have a joint board wherein they share water quality programs, drains and costs. There are 16 water rights within the District – 69 percent are senior water rights and 31 percent junior. They have 400 miles of laterals and/or canals. A lot of it is open ditch but they are in the process of converting to pipe. A member asked if any assistance is provided to landowners to convert to pipe. Ron stated that if a landowner would provide materials SVID would handle the installation.

SVID is also in the process of converting to flow meters as they give a better reading of water usage and the landowner can decide and control when they want water or not. Flow meters provide the landowner with a far more accurate reading of usage. The old system is difficult to manage and the landowner must call in by midnight the night before (on weekdays only) to indicate a change in water needs. Approximately 18,000 acres or 20 percent of the District have been converted to flow meters. Roza started their conversion earlier - approximately 75 percent of their District has been changed over to flow meters.

A member asked if water quality was monitored. Ron said that multiple water samples of anything coming into the drains are pulled and tested for turbidity. If there is a problem landowners are told and are required to fix it. One requirement to fix the problem may be a sedimentation pond. SVID will restrict irrigation water to the landowner if it's not fixed in a timely manner.

Crop surveys are done approximately every five years. From the survey in 2003 it was determined that 44% of the landowners use rill irrigation; 2% drip and 54% sprinkler. In the 2014 survey 21% of the landowners are using rill irrigation; 9% drip and 70% sprinklers. Ron was encouraged that landowners are moving in the right direction and stated that if landowners they have drip or pivots they have more control and will use less water which drives less nitrates.

A member asked if there was financial assistance from the Districts to the landowners to convert to this type of irrigation. Ron responded and said initially yes there was through loan programs, but not currently. He also noted the conversion can be quite expensive. Ron did add that there were no pivots over open ditches.

SVID does keep some flow estimations on the four major drainage ditches as those flow into the Yakima. These major drainage ditches are tested as well.

There is some testing for E-coli done in the main canal particularly around harvest time in order to meet food safety regulatory criteria.

Sanjay Barik added that studies were done by USGS and the Southern Yakima Conservation District that might be useful to the group as well.

Jim Davenport asked if the District had regulatory framework to work on water quality issues – he added that the group was aware already of the statutes on water quantity. Ron responded and said that he isn't aware of any regulatory framework with regard to water quality, but that the Board does have the authority to create a standard like they did when dealing with the turbidity issues. No law was generated with regard to turbidity because the District took a proactive stance and was in compliance long before the deadline became due. The Board was able to institute policies and the landowners were required to come into compliance with the policies or their water would be restricted.

A member asked if the District has the ability to pass a regulation requiring the landowners to clean up their water. Jim Davenport clarified and said a board does not have regulatory authority. It can only create policies and then require its members to comply with them. Ron added that

when they created a policy with regard to turbidity they recommended several best management procedures (BMP's) that the landowners could choose from and set a statistical level of expectation that each land owner needed to meet. If the level was not met they were flagged.

A member asked if Ron felt they met the timeline because landowners had been educated or because of they were threatened with a reduction of water. Ron indicated that he felt most landowners didn't really know they had a problem and change came about because of education and leadership. Another member commented that the District had a broader presence in getting the message out to the landowners because of the Ditch Riders – these people were already in the landscape and they could be consistent with follow-up. Ron added that the Districts received State funds through the Department of Ecology for low interest farm loans to convert away from rill irrigation by installing drip or sprinkler systems. Landowners with return water that was not in compliance received a letter and had to have a plan for short term compliance and needed to produce a long-term plan as well.

A member asked if the water was tested at the head gate. Ron said again they test for temperature, turbidity and bacteria as outlined previously. When asked if this was increasing or decreasing Ron said that it varies as it comes through the system. Another member wanted to know if they was testing for nutrients – Ron thought maybe some.

Another member asked if Ron could estimate the cost for SVID to test “ins” and “outs” for nitrates on all the major drains so that if the group decided to pursue this they would know what it would cost. A member commented that testing is only a piece of the picture – the group would still not know where the water came from. They also indicated that if the group would fund this they would need to have a good idea what's coming into the system, a good idea of irrigating, a good idea of drain out and a good idea of evaporation rate.

Ron added that he doesn't know how much water leaches back into the ground from the drains if any. It mostly flows into the drains and is then carried to the river. He felt that the canals do lose water through seepage which is why Roza has lined some of their canals.

A member asked if the District ever adds anything to the water. Ron indicated that the only additive was herbicides and that they have a NPDS permit for this.

The group then talked through a number of different questions: how would nitrates in drains relate to ground water? And, if nitrates are found in water in drains does that assume it goes to groundwater? In winter when the groundwater level is going down do concentrates go up? Some responses were that the groundwater would travel the path of least resistance to the drains. Another member felt that most of the nitrates in drain water are ground water. It was also noted that properly managed sprinkler systems don't drive nutrients much past the root system.

Presentation by Phil Rigdon, Yakama Nation – Laws and Policies from a Yakama Nation Perspective

Phil Rigdon from the Yakama Nation thanked the group for its invitation. Phil informed the group that Chair Jean Mendoza, had provided him with a list of questions. He stated that while

he was willing to talk about the issues Jean raised, he was cautious and reminded the group that these were tribal issues. Phil reminded the group that the tribe is not subject to State or County regulation but instead is accountable to the Bureau of Indian Affairs and the Department of Ecology as it pertained to issues of water and air quality – they deal with more federal agencies than people realize. Phil began by providing a bit of history as it pertained to the rights of tribal nations – various Supreme Court decisions, court cases, and treaties that had been reached.

Phil indicated that the tribe's greatest concerns were first, the needs of its people and second, the water and salmon in the river as their people depended on these resources for their survival. The tribe realized some time ago that there wouldn't be salmon in the basin if they didn't do something and so they began several programs. One was to create fish hatcheries in order to increase the fish population. The other was to consider how they could recharge the aquifer during the winter months and thus better regulate the temperature of the water in the summer giving the fish a better chance of survival. As a result they have been allowing specific areas of tribal lands (i.e., White Swan aquifer by cutting water from Toppenish Creek) to "fan flood" in the winter (so the water flows to infiltrate the land) by taking some of the dikes out. They also began planting trees to slow down the travel of the water thereby allowing for an increase in the level of the groundwater. This has made the water ways more "fish friendly." Phil felt as well that this ground water recharge may also have helped to improve the water quality. In addition, the tribe is hoping that deep groundwater springs and wells will be restored - they have found some evidence of this already and there are shorter periods of "low points" at Toppenish Creek.

Phil also expressed a concern about global warming and expressed a hope that what happened last year was a "1 in 50 year" event but was concerned it will be more the norm. The Yakama Nation is already working on a climate change strategy plan with a grant through the federal government. All programs are involved in it including water and fish. Phil believes that the tribe is way ahead of everyone else on climate change. Phil also advised the group that the tribe put a moratorium on CAFO's on the reservation in 2008. They are looking at strengthening this moratorium to provide better definition. He noted too that they had a concern about fertilizer and that they are paying attention when the GWMA talks about what it puts in the drains because they are concerned too. These issues can be a life-changing thing for a member of the tribe as they can't just get up and move – the land they reside on has been passed down family to family. The tribe had received only \$100,000 to deal with groundwater issues on the reservation – they are stretched and don't have the resources to do it all. A member asked if the tribe was doing any water sampling – Phil indicated that this was a requirement of the funding they had received so they will need to report their findings but at present they are not testing for water quality – just monitoring the water level. Phil noted he would be interested too as the GWMA obtains information on atmospheric deposition. When asked about the tribe's involvement in the GWMA Phil indicated he felt they were involved as both Stuart Crane and Elizabeth Sanchez were part of several committees.

Jim Davenport asked Phil if the tribe had any regulations pertaining to manure applications. He said they did not. Another member then asked Jim why he only targeted complaints about manure applications. Phil responded and said that they would much prefer the use of what he termed "biosolids" meaning organic type fertilizers (not municipal sludge) such as manure and compost over synthetic fertilizers.

Phil discussed the likelihood of the Nation initiating groundwater adjudication. He said the Nation is hesitant to do so, preferring to work together to address the impact of groundwater withdrawals on the Nation's more senior surface water rights, but reserves the option to do so.

Matrix and Spreadsheet for Analysis of Regulations/Regulatory Work Group Plan for 2016
Ginny Prest has invited Grant Barnes of the WSDA speaking at next month's regulatory meeting on fertilization and chemigation.

Chair Jean Mendoza asked the group to write down three questions before they left that they felt the Regulatory Working group needs to address as they moved forward. The papers were turned into Jean who would compile a list and forward it on to the working group at a later date.

The meeting was adjourned at 7:10 PM

Resources Requested

Recommendations for GWAC

Deliverables/Products Status

Proposed Next Steps

Residential, Commercial, Industrial, Municipal (RCIM) Work Group

Charge from Groundwater Management Area Advisory Committee

Working Group Members

Robert Farrell, Chair (Port of Sunnyside), Elizabeth Sanchey (Yakama Nation), Ryan Ibach (Yakima Health District), Jan Whitefoot (Concerned Citizens of Yakama Reservation), John Van Wingerden (Port of Sunnyside), Stuart Turner (Turner & Co.), Tom Ring (Yakama Nation), Kathleen Rogers (Citizen Rep), Sanjay Barik (Ecology), Dan DeGroot (Yakima Dairy Federation)

Meetings/Calls Dates

Meeting: January 28, 2016 10:00 am – 12:00 pm
Radio KDNA, 121 Sunnyside Ave., Granger, WA 98932
Call in: 509-574-2353 (pin 2353#)

Participants

Present: Robert Farrell, (Chair), Jim Davenport, Ryan Ibach, Dan DeGroot, Kathleen Rogers, Vern Redifer, and Chris Saunders (Yakima County Support Staff)

Key Discussion Points

The group convened at 10:09am.

Bob Farrell began the meeting by stating his intention to resign as chair of the working group, due to work demands at the Port of Sunnyside. After thanking Bob for his service, and a brief deliberation, the group elected Ryan Ibach chair by acclamation. Bob continued as chair for the remainder of the meeting, and agreed to remain as a member of the GWAC so the group would have access to his institutional memory.

Recommended nitrogen loading from hobby farms

Following up on the RCIM's last meeting in September, Vern Redifer supplied the group with numbers as to the number of parcels in Yakima County with an area of 10 acres or less that may be hobby farms. According to the County's GIS Department:

0 – 2.5: 2,323 acres
2.6 – 5: 314 acres
5.1 – 10: 120 acres

Total: 2,757 acres

The GWMA contains 175,161.2 acres of land, leaving hobby farms as 1.6% of the total.

A member of the group inquired as to how the county wound up with so many tiny acres of land. Vern described the way the law had changed over the decades. Prior to the 1970s, it was very easy for landowners to go to Yakima County and subdivide their land. The laws became more stringent over time, especially with the passage of the Growth Management Act of 1990.

Nitrogen loading from large septic systems

A member of the group discussed his concerns about monitoring septic systems, which many news sources and commentary states that the EPA considers a leading cause of groundwater contamination. Vern replied that the County can produce a map showing density of residential septic systems in the GWMA area. Such a map can be compared with a map showing locations of high-nitrate groundwater samples, and any correlations between the two can be observed. In addition, the Census provides demographic data for tracts of land, which can be used to refine the data.

Jim Davenport told the group that according to figures from the Irrigated Ag Work Group (IAWG), in 2014, 109,000 acres (62.2%) of the GWMA were classified as irrigated agriculture. Dairies are not counted as irrigated ag or RCIM. He cautioned that RCIM nitrate contributions compared to irrigated ag plus dairy were likely to be *de minimis*. Vern added that, percentages aside, it was still a valid public health concern to make sure people were aware of a safe septic pumping schedule for a dwelling of their density.

The group agreed to wait until the County had finished its work on deep soil sampling and had produced the maps Vern spoke of before RCIM made any recommendations to the GWAC.

Draft modifications to Deep Soil Sampling Plan for use at RCIM sites

Following up on the request made at the September RCIM meeting to contact Laurie Crowe in regards to finding a soil scientist for assistance in putting together a protocol, Bob summarized the replies Laurie received. Hiring a soil scientist would be an expensive proposition. Based on the work the IAWG has done so far, it is possible for working groups to modify their plans as they identified sites where more deep soil sampling was needed. It was recommended to Laurie that any field study of RCIM land must include lawns, evaluated using standard assumptions, and that the first cut should focus on literature values. Bob reminded the group that in the first survey for soil sampling, residential property owners had asked if they could be included, and the GWAC had never reached a decision on the matter. It was unclear whose budget the money would come from to conduct those samples.

The proposal to modify protocols on deep soil sampling at RCIM sites was tabled, to be taken up again at a future meeting, pending further information and data from the County.

The meeting adjourned at 12:10pm.

Resources Requested

- It was suggested that the group speak to the EPO workgroup about developing a public education campaign regarding pumping septic tanks
- The group would like to see the maps showing density of residential septic systems within the GWMA, to compare with map of high-nitrate groundwater samples
- It was also suggested that someone on RCIM should talk to the Regulatory Framework Working Group about scheduling presentations by the Department of Ecology concerning commercial, industrial, and municipal activities that may contribute to high nitrate levels in groundwater

Recommendations for GWAC

-

Deliverables/Products Status

-

Proposed Next Steps

Residential, Commercial, Industrial, Municipal (RCIM) Work Group

Charge from Groundwater Management Area Advisory Committee

Working Group Members

Ryan Ibach, Chair (Yakima Health District), Elizabeth Sanchez (Yakama Nation), Jan Whitefoot (Concerned Citizens of Yakama Reservation), John Van Wingerden (Port of Sunnyside), Stuart Turner (Turner & Co.), Tom Ring (Yakama Nation), Kathleen Rogers (Citizen Rep), Sanjay Barik (Ecology), Dan DeGroot (Yakima Dairy Federation)

Meetings/Calls Dates

Meeting: March 24, 2016 10:00 am – 12:00 pm
Radio KDNA, 121 Sunnyside Ave., Granger, WA 98932
Call in: 509-574-2353 (pin 2353#)

Participants

Present: Ryan Ibach, (Chair), Jim Davenport, Dan DeGroot, Kathleen Rogers, Jim Dyjak, Ted Silvestri, and Chris Saunders (Yakima County Support Staff)

Key Discussion Points

The meeting was called to order at 10:00am.

Time and location changes of RCIM Meetings

After a brief discussion, the group decided that the second Monday of each month would be a more convenient time to hold meetings. The next meeting (to be held April 11th from 2pm to 4pm under the new schedule) will take place at the same location in the Radio KDNA conference room. The location of future meetings will be subject to review at that meeting. A member of the group stated that Sunnyside would be a preferable location, unless the cost of booking a conference room was significantly higher than at Radio KDNA.

Septic Systems

- **Charting**

The group discussed the septic system map of the GWMA produced for the last meeting by Yakima County GIS. A member stated that the map presented an incomplete picture of the septic systems on their property, listing only the system connected to their house, while leaving out the toilets and showers connected to the barns on their property, and their neighbor's processing facility. The member had obtained a permit from the Yakima Health District to set up the system. Ryan stated that YHD had given the county all the information on GWMA septic systems it had.

The member referenced an EPA study stating that groundwater contamination “exponentially” increases with the presence of a “high-density” septic system, defined as 40 or more systems per square mile, and stated that there is a lot of density within the GWMA. Jim Davenport noted previous remarks from a GWAC member at a different meeting that an increase in the farm labor workforce during the summer puts more pressure on septic systems and could contribute significantly to groundwater contamination. The information Jim received documented an increase from 25,000 to 35,000 workers during the summer, and that the data did not show a significant increase in the effect of septic systems on groundwater during that period. Questions arose about the concentration of workers in certain areas, as well as the definition of “exponentially,” as used by the EPA.

Ted Silvestri from YHD made a presentation and answered questions about the operation of septic systems. A septic tank is an anaerobic digester which separates household wastewater into solids and liquids. Solids heavier than water sink to the bottom, while substances lighter than water, such as cooking greases, float to the top. Bacteria naturally found in the wastewater works to break down the solids. Those solids that can’t be broken down naturally remain in the tank until it is pumped. The treated wastewater is then distributed into a drain field buried beneath three feet of dirt by a perforated tube. When septic systems fail due to insufficient pumping of the system, the tank backs up. The accumulation of improperly-disposed grease causes the soil in the drain field to seal up. The bacteria does not break down the solids as quickly due to lack of oxygen, and the wastewater flows to the lowest available drain. If the wastewater doesn’t surface immediately, it produces a black slimy mud under the soil, and flows laterally for a year or two until the system backs up. Whether it gets into the groundwater table depends on the distance between the system and the table. At a site like Cheyne Landfill, wastewater is not going to get there. Other Lower Valley facilities might. Restaurants are required to carry grease traps, but residential properties are not.

- **Proposed research project**

Ryan reminded the group that Stu Turner had proposed conducting a small-scale research project on representative fields concerning potential nitrate contamination attributable to improperly-operated septic systems. Jim Davenport supported the idea in order to fully inform GWAC members, subject to budgetary limits. Details on how the project would be conducted, what types of soils would be sampled, whether all the septic systems in the GWMA area are documented, are unknown at this point. Ryan pledged to contact Stu and flesh out the proposal some more.

Bio-solids

- **Possible presentation from Yakima Health District or Natural Selection Farms**

Stu Turner had also suggested that the group might want to hear a presentation from YHD and/or Natural Selection Farms, a large family-owned organic farm near Sunnyside, as to the application of bio-solids on farm fields. Ted Silvestri from YHD was present at the meeting to answer questions on this subject. It was also noted that Peter Severtson from the Department of Ecology

(DOE) had spoken to the Regulatory Framework group in September on this matter, and that notes from this meeting were available for review on the County's website.

(<http://www.yakimacounty.us/AgendaCenter/ViewFile/Minutes/09092015-391>)

Ted walked through the process for testing fields. Inspections are conducted on fields twice yearly, more than that if they receive complaints. They take place before the crops are planted, and afterwards to determine concentration levels. The top two to three feet of soil is tested. If a field contains different soil types, they are tested as different fields. The limiting factor on bio-solids is almost always nitrogen. The nature of bio-solids change based on the time of year in small towns due to the changing seasons, although not so much in Yakima County. Bio-solids are broken down into Class A, Class B, and Class C. State law requires bio-solids to be classified as A or B when it comes to vector attraction (meaning a stench that attracts insects which can carry disease). In practice, most bio-solids are Class B, and are safe if handled properly. Getting them to Class A costs a lot of money. (For further info on state laws governing bio-solids management, see <http://apps.leg.wa.gov/WAC/default.aspx?cite=173-308>)

Jim Davenport inquired how many permits had been issued for bio-solids fields. Ted responded that the state has one general permit for bio-solids and Natural Selection Farms has a letter from DOE that allows them to apply bio-solids to fields. There are three active stockpile sites in Yakima County.

A member inquired as to who is responsible for approving the application of bio-solids. Ted answered that DOE was responsible. The member responded that YHD's website claims YHD is responsible, and commented that contradictory answers from regulatory officials has been a recurring problem in this whole discussion. Ted responded that any statement on YHD's website claiming responsibility for bio-solids approval was outdated, and that Peter Severtson at DOE was the responsible party.

The group decided that they would be interested in hearing further information from Natural Selection Farms as to their methods of bio-solids application. The farm has been in operation since 1987, and it was suggested they would have some interesting observations regarding trend-lines.

- **Overlay map**

Ryan informed the group that DOE is working on developing an overlay map on permitted sites in the GWMA that receive bio-solids, but was having trouble with their GIS software. Jim Davenport suggested sending their information to Yakima County GIS.

- **Deep Soil Sampling on bio-solid fields**

The group discussed the possibility of conducting deep soil sampling on GWMA fields that apply bio-solids, in addition to the testing already underway on fields that apply manure. Questions arose as to how to convince people to volunteer for this testing. A member of the group questioned the transparency of the deep soil sampling process that has taken place so far, and expressed concerns as to whether representatives from the dairy industry sitting on the GWAC

had been completely forthcoming to the group concerning the viability of certain testing methods.

In response to a question on farmers' opinions about bio-solids, Ted stated that farmers who apply bio-solids to their fields are happy doing so, since they bring the soil more alive, and are safer than what he had seen with the application of manure. Ted went on to say that bio-solids are treated at the plant, and only mostly-stable compounds make it through to the field, whereas manure can be handled safely, but it's not tested. A member of the group disputed Ted's statement that bio-solids are safer to apply to fields than manure. He also stated that manure is indeed tested before applied to the field, and catalogued as to what type of manure, what species of animal, whether it's processed or unprocessed.

Ryan requested that Ted write up an opinion on the feasibility of conducting deep soil sampling on the application of bio-solids on fields. Ted assented to doing so, and that this material would be presented to RCIM and any other working groups where there's an overlap on the issue.

- **Member Questions**

A member of the group had submitted some questions for YHD via e-mail on February 11th, which Ryan read off, and Ted answered.

What precautions are made to make sure human bio-solids are non-hazardous at Yakima County landfills, (notably in the GWMA)? Who is buying bio-solids from Cheyne Landfill?

The landfills take waste from outhouses and other sources and store them in a shallow lagoon. The state requires them to recycle everything for use on fields, which was a subject of dispute between the state and the county, given some of the solid material that winds up in there which no farmer would want on their fields.

Are the Yakima County landfill bio-solids lagoons monitored for A) Leakage, B) Proper intake and outtake procedures, and C) Do they keep records of where it comes from and where it goes?

Yes to all three questions. The lagoons are double-lined, they have a catch-basin, and there are monitoring wells stationed around the lagoon. The County Solid Waste Department keeps those records. As for where it comes from, the sources of septage are self-reported.

Ted also mentioned that the county is adding another drying lagoon for septic disposal, possibly because more people are pumping their septic tanks regularly. A member suggested this may be of interest to the EPO working group.

Resources Requested

- From County Admin: A list of potential RCIM meeting sites in Sunnyside, and how their booking rates compare to Radio KDNA

- From County GIS: Maps showing density of septic systems (residential as well as commercial/industrial/municipal) within the GWMA, compared with map of high-nitrate groundwater samples
- From Yakima Health District or County GIS: An overlay map of permitted areas within the GWMA that receive bio-solids
- From members: The EPA study on high-density septic systems referenced during the meeting
- From members: The Chesapeake Bay study referenced during the meeting
- From Stu Turner: Details concerning cost and implementation of his proposed field sampling project regarding septic systems
- From Natural Selection Farms: Whether a representative from the farm would be willing to address the working group at a future meeting as to bio-solids application

Recommendations for GWAC

-

Deliverables/Products Status

-

Proposed Next Steps

- Next meeting to be held on May 9th, 2016, at Radio KDNA from 2pm to 4pm

Attachment B

- Deep Soil Sampling Combined Report – Fall 2015
- PGG Technical Memorandum “Draft Ambient Groundwater Monitoring Network Location Selection Method” dated March 18, 2016.

Deep Soil Sampling - Fall 2015

3083	Acres 8	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)							Cropping History					Soil 177 - Warden Silt Loam 2-5% Slopes					
	Soil Testing? YES	10/13/2015	Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2016	Hole	Consistance	Moisture	Roots	Refusal
	Test Frequency Once per Year	1 ft 417	2016	0	0	0	0	0	0	0	Triticale	10 Tons			Crop Condition Good Planned	A	S, SH	M, M	1.2	
	Current Irrigation System	2 ft 412	2015	0	100	0	0	0	0	100	Barley	2.7 Tons	Barley Hay	2.5 Tons		B	S, S, SH	M, Dp, M	1.8	
	Type Sprinklers	3 ft 118	2014	150	0	0	0	0	0	150	Alfalfa	10 Tons				C	S, SH, SH	M, M, Dp	1.5	
	Schedule Shovel Method	4 ft 72	2013	150	0	0	0	0	0	150	Alfalfa	10 Tons				D	S, SH, SH	M, M, DP	2.2	
	Hour Sets	5 ft 77	2012	0	0	0	0	0	0	0						E				
	Current Years 20	6 ft 22	Comments In spring the liquid manure is about 9 pounds per 1000 gallons. During irrigation season water is blended down to under 1 pound per 1000 gallons.																	
	Previous Irrigation System	TOTAL 1118																		
	Type Sprinklers - Hand Lines	NH4-N 56																		
Previous Years	ORGANIC PERCENT 2.96																			
Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented																			Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet	

3084	Acres 55	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)							Cropping History					Soil 176 - Warden Silt Loam 0 to 2 percent slopes					
	Soil Testing? NO	10/13/2015	Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2015	Hole	Consistance	Moisture	Roots	Refusal
	Test Frequency Not in last two years	1 ft 14	2016	0	0	0	0	0	0	0					Crop Condition Good Actual	A	S, S	M, Dp	3	
	Current Irrigation System	2 ft 5	2015	0	0	0	0	0	0	0	Pasture	2.5 Tons				B	S, S, S	M, Dp, Dp	0.8	
	Type Sprinklers	3 ft 3	2014	0	0	200	0	0	0	200	Triticale	8 Tons	Corn Silage	27 Tons		C	S, S, S	M, Dp, Dp	0.6	
	Schedule Soil Moisture Sensors	4 ft 3	2013	0	0	200	0	0	0	200	Triticale	8 Tons	Corn Silage	28 Tons		D	S, SH	M, Dp	0.6	
	Hour Sets 24	5 ft 6	2012	0	0	200	0	0	0	200						E				
	Current Years 1	6 ft 5	Comments Nutrients applied in spring.																	
	Previous Irrigation System	TOTAL 36																		
	Type Rill Irrigation	NH4-N 30																		
Previous Years	ORGANIC PERCENT 2.72																			
Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented																			Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet	

3085	Acres 20	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)							Cropping History					Soil 177 - Warden Silt Loam 2-5% Slopes					
	Soil Testing? YES	10/14/2015	Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2016	Hole	Consistance	Moisture	Roots	Refusal
	Test Frequency Twice per year	1 ft 110	2016	0	0	0	0	0	0	0	Triticale	10 Tons			Crop Condition Good Planned	A	S	M		
	Current Irrigation System	2 ft 108	2015	0	113	300	0	0	0	413	Corn	30 Tons				B	S	M	0.9	
	Type Solid Set Above Canopy	3 ft 73	2014	0	0	100	0	0	0	100	Grapes	9 Tons				C	S	M	0.7	
	Schedule Soil Moisture Sensors	4 ft 80	2013	0	0	100	0	0	0	100	Grapes	8 Tons				D	S	M		
	Hour Sets 24	5 ft 266	2012	0	0	0	0	0	0	0						E				
	Current Years 3	6 ft 108	Comments																	
	Previous Irrigation System	TOTAL 745																		
	Type Rill Irrigation	NH4-N 10																		
Previous Years	ORGANIC PERCENT 1.56																			
Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented																			Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet	

Deep Soil Sampling - Fall 2015

3086	Acres	38	NO3 (#N/ACRE) 10/14/2015	Fertilizer Applications (#N/Acre)								Cropping History				Soil 178 - Warden Silt Loam 5-8% Slopes						
	Soil Testing?	YES		Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2016	Hole	Consistance	Moisture	Roots	Refusal	
	Test Frequency	Twice per year		2016		0	0	0	0	0	0	0	Triticale	8 Tons			Crop Condition Good Planned	A	S, S, S	M, D, D	2	
	Current Irrigation System			2015	20	0	225	0	0	0	245	Triticale	8 Tons	Corn	25 Tons	B		S, S, S	M, D, D	1.5		
	Type	Sprinklers		2014	60	0	225	0	0	0	285	Triticale	8 Tons	Corn	25 Tons	C		S, S, S	M, D, D	1.2		
	Schedule	check the field		2013	60	0	225	0	0	0	285	Triticale	8 Tons	Corn	25 Tons	D		S, S, S	M, D, D	1.5		
	Hour Sets			2012	0	0	0	0	0	0	0					E						
	Current Years	15		Comments												Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented						
	Previous Irrigation System															Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet						
	Type	Rill Irrigation																				
Previous Years																						

3087	Acres	15	NO3 (#N/ACRE) 10/14/2015	Fertilizer Applications (#N/Acre)								Cropping History				Soil 177 - Warden Silt Loam 2-5% Slopes					
	Soil Testing?	YES		Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2016	Hole	Consistance	Moisture	Roots	Refusal
	Test Frequency	Once per Year		2016	0	0	0	0	0	0	0	Alfalfa	10 Tons			Crop Condition Good Planned	A	S, S, S, SH	M, D, M, M	2.2	
	Current Irrigation System			2015	0	266	0	0	0	0	266	Alfalfa	10 Tons				B	S, S, S	M, D, M	1.8	
	Type	Sprinklers		2014	0	266	0	0	0	0	266	Sudan Grass	10 Tons	Triticale	10 Tons		C	S, S	M, D	2.5	5
	Schedule	Routine Schedule		2013	0	266	0	0	0	0	266	Sudan Grass	10 Tons	Triticale	10 Tons		D	S, S	M, D	2.1	4
	Hour Sets	24 one time a month		2012	0	0	0	0	0	0	0						E				
	Current Years	10		Comments												Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented					
	Previous Irrigation System															Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet					
	Type																				
Previous Years																					

3088	Acres	10	NO3 (#N/ACRE) 10/14/2015	Fertilizer Applications (#N/Acre)								Cropping History				Soil 18 - Cleman Very Fine Sandy Loam 0-2% Slopes					
	Soil Testing?	NO		Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2015	Hole	Consistance	Moisture	Roots	Refusal
	Test Frequency	N/A		2016	0	0	0	0	0	0	0					Crop Condition Good Actual	A	S, SH, SH	D, Dp, W	3.3	
	Current Irrigation System			2015	0	0	0	0	0	0	0	Alfalfa	9 Tons				B	S, SH, SH	D, Dp, W	5.3	
	Type	Rill Irrigation		2014	0	0	0	0	0	0	0	Alfalfa	8 Tons				C	S, SH, SH	D, Dp, W	1.4	
	Schedule	Routine Schedule		2013	0	0	0	0	0	0	0	Alfalfa	7 Tons				D	S, SH, SH	D, Dp, W	1.9	
	Hour Sets	1x per month		2012	0	0	0	0	0	0	0	Alfalfa	8 Tons				E				
	Current Years	100		Comments								No nutrients applied last 5 years				Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented					
	Previous Irrigation System															Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet					
	Type	Rill Irrigation																			
Previous Years																					

Deep Soil Sampling - Fall 2015

3089	Acres 20 Soil Testing? YES Test Frequency Once per Year Current Irrigation System Type Sprinklers Schedule Routine Schedule Hour Sets 24 twice a month Current Years 1 Previous Irrigation System Type Rill Irrigation Previous Years 100	NO3 (#N/ACRE) 10/14/2015 1 ft 207 2 ft 276 3 ft 290 4 ft 166 5 ft 130 6 ft 80 TOTAL 1149 NH4-N 29 ORGANIC 2.49 PERCENT	Fertilizer Applications (#N/Acre)								Cropping History				2016 Crop Condition Good Planned	Soil 139 - Sinloc Silt Loam 0-2% Slopes				
			Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield		Hole	Consistance	Moisture	Roots	Refusal
			2016	0	0	0	0	0	0	0	Alfalfa	9 Tons				A	S, S, S, S, S	M, Dp, Dp, Dp, Dp	2.8	
			2015	100	0	0	0	0	0	100	Barley	3.5 Tons				B	S, S, S, S, S	M, Dp, Dp, Dp, Dp	3	
			2014	100	0	0	0	0	0	100	Corn Grain	6 Tons				C	S, S, S, S, S	M, Dp, Dp, Dp, Dp	2.7	
			2013	100	0	0	0	0	0	100	Corn Grain	6 Tons				D	S, S, S,	M, Dp, Dp	1.8	
			2012	0	0	0	0	0	0	0						E				
			Comments Manure application in spring								Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet									

3090	Acres 33 Soil Testing? YES Test Frequency Twice per Year Current Irrigation System Type Sprinklers Schedule Routine Schedule Hour Sets 24 Current Years 25 Previous Irrigation System Type Previous Years	NO3 (#N/ACRE) 10/14/2015 1 ft 51 2 ft 28 3 ft 25 4 ft 42 5 ft 40 6 ft 33 TOTAL 219 NH4-N 36 ORGANIC 2.29 PERCENT	Fertilizer Applications (#N/Acre)								Cropping History				2016 Crop Condition Fair Planned	Soil 140 - Sinloc Silt Loam 2-5% Slopes				
			Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield		Hole	Consistance	Moisture	Roots	Refusal
			2016	0	0	0	0	0	0	0	Alfalfa	9 Tons				A	S, S	M, Dp	1.9	
			2015	0	350	0	0	0	0	350	Triticale	10 Tons	Sudan Grass	6 Tons		B	S, S	M, Dp	1.8	
			2014	0	350	0	0	0	0	350	Triticale	9 Tons	Sudan Grass	7 Tons		C	S, S	M, Dp	1.6	
			2013	0	350	0	0	0	0	350	Triticale	10 Tons	Sudan Grass	7 Tons		D	S, S	M, Dp	1.1	
			2012	0	0	0	0	0	0	0						E				
			Comments								Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet									

3091	Acres 45 Soil Testing? YES Test Frequency Once per Year Current Irrigation System Type Sprinklers Schedule Routine Schedule Hour Sets 5 day sets Current Years 10 Previous Irrigation System Type Sprinklers - Wheel Lines Previous Years	NO3 (#N/ACRE) 10/15/2015 1 ft 86 2 ft 43 3 ft 46 4 ft 56 5 ft 19 6 ft 4 TOTAL 254 NH4-N 25 ORGANIC 2.41 PERCENT	Fertilizer Applications (#N/Acre)								Cropping History				2016 Crop Condition Fair Planned	Soil 177 - Warden Silt Loam 2-5% Slopes				
			Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield		Hole	Consistance	Moisture	Roots	Refusal
			2016	150	0	0	0	0	0	150	Alfalfa	9 Tons				A	S	M	6	
			2015	300	0	0	0	0	0	300	Alfalfa	8.5 Tons				B	S	M	6	
			2014	300	0	0	0	0	0	300	Alfalfa	9 Tons				C	S	M	4	4
			2013	300	0	0	0	0	0	300	Alfalfa	9.5 Tons				D	S	M	2.5	4
			2012	0	0	0	0	0	0	0						E				
			Comments Split applications - 150 lbs thru pivot point in spring, 150 lbs thru pivot point in fall								Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet									

Deep Soil Sampling - Fall 2015

3092	Acres 36	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)										Cropping History				Soil 138 - Sinloc Fine Sandy Loam 0-2% Slopes				
	Soil Testing? YES	10/15/2015	Year	Liquid	Solid	Com.	Bio	Comp	Other	Total											
	Test Frequency Once per Year	1 ft 22		Manure	Manure																
	Current Irrigation System	2 ft 8																			
	Type Sprinklers	3 ft 9	2016	0	0	0	0	0	0	0	Alfalfa	8 Tons									
		4 ft 3	2015	0	0	0	0	0	0	0	Alfalfa	8 Tons									
	Schedule Routine Schedule	5 ft 3	2014	0	0	0	0	0	0	0	Alfalfa	7 Tons									
		6 ft 3	2013	0	0	0	0	0	0	0	Alfalfa	9 Tons									
	Hour Sets 24	TOTAL 48	2012	0	0	0	0	0	0	0											
	Current Years 20	NH4-N 14	Comments	No nutrients have been added since 2012																	
Previous Irrigation System	PERCENT 2.15																				
Type Unknown																					
Previous Years																					
3093	Acres 80	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)										Cropping History				Soil 177 - Warden Silt Loam 2-5% Slopes				
	Soil Testing? YES	10/15/2015	Year	Liquid	Solid	Com.	Bio	Comp	Other	Total											
	Test Frequency Once per Year	1 ft 16		Manure	Manure																
	Current Irrigation System	2 ft 3																			
	Type Sprinklers	3 ft 3	2016	0	0	0	0	0	0	0	Alfalfa	10 Tons									
		4 ft 4	2015	0	0	50	0	0	0	50	Alfalfa	10 Tons									
	Schedule Routine Schedule	5 ft 6	2014	0	0	50	0	0	0	50	Alfalfa	10 Tons									
		6 ft 7	2013	0	0	50	0	0	0	50	Alfalfa	10 Tons									
	Hour Sets Check the soil	TOTAL 39	2012	0	0	0	0	0	0	0											
	Current Years 6	NH4-N 19	Comments	N is applied in the spring																	
Previous Irrigation System	PERCENT 1.63																				
Type Unknown																					
Previous Years																					
3094	Acres 35	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)										Cropping History				Soil 175 - Warden fine silty loan 8 to 15 percent slopes				
	Soil Testing? YES	10/15/2015	Year	Liquid	Solid	Com.	Bio	Comp	Other	Total											
	Test Frequency Twice per year	1 ft 467		Manure	Manure																
	Current Irrigation System	2 ft 644																			
	Type Sprinklers	3 ft 776	2016	190	0	0	0	0	0	190	Triticale	7 Tons									
		4 ft 726	2015	320	0	0	0	0	0	320	Triticale	8 Tons	Corn Silage	27 Tons							
	Schedule Routine Schedule	5 ft 576	2014	360	0	0	0	0	0	360	Triticale	7 Tons	Corn Silage	27 Tons							
		6 ft 565	2013	342	0	0	0	0	0	342	Triticale	7 Tons	Corn Silage	25 Tons							
	Hour Sets Check Soil	TOTAL 3754	2012	0	0	0	0	0	0	0											
	Current Years 16	NH4-N 50	Comments	Liquid manure is applied twice a year. Split Application. In current year, only 1 application has occurred.																	
Previous Irrigation System	PERCENT 2.85																				
Type Rill Irrigation																					
Previous Years																					

Deep Soil Sampling - Fall 2015

3095	Acres 75	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)										Cropping History					Soil 57 - Hezel Loamy Fine Sand 0-2% Slopes				
	Soil Testing? YES	10/15/2015	Year	Liquid	Solid	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2016	Hole	Consistance	Moisture	Roots	Refusal		
	Test Frequency Once per Year	1 ft 60	2016	0	0	0	0	0	0	0	Triticale	10 Tons			Crop Condition Good Planned	A	S, S, S	M, M, Dp	1.4			
	Current Irrigation System	2 ft 90	2015	0	0	0	0	0	0	0	Triticale	Tons	Corn Silage	Tons		B	S, S, S	M, M, Dp	0.8	4		
	Type Sprinklers	3 ft 140	2014	0	0	0	0	0	0	0	Triticale	Tons	Corn Silage	Tons		C	S, S	M, Dp	0.9	4		
		4 ft 178	2013	0	0	0	0	0	0	0	Triticale	tons				D	S, S, S	M, M, Dp	2.8	4		
		5 ft	2012	0	0	0	0	0	0	0						E						
	Schedule Only 1 irrigation to sprout triticale	6 ft	Comments This field has had a history of manure application for double cropping. The property changed ownership and application records and yield records were not available.																			
	Hour Sets	TOTAL 468																				
	Current Years	NH4-N 17																				
Previous Years	ORGANIC 1.92																					
	PERCENT																					
	Previous Years																					

3096	Acres 16	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)										Cropping History					Soil 95 - Quincy Loamy Fine Sand 0-10% Slopes				
	Soil Testing? YES	10/16/2015	Year	Liquid	Solid	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2016	Hole	Consistance	Moisture	Roots	Refusal		
	Test Frequency Twice per year	1 ft 27	2016	0	0	0	0	0	0	0	Triticale	9 Tons			Crop Condition Good Planned	A	S, S, S, S, S	M, M, M, M, Dp, M	2.9			
	Current Irrigation System	2 ft 8	2015	0	0	0	0	0	0	0	Triticale	7 Tons	Sudan Grass	7 Tons		B	S, S, S, S, S	M, M, Dp, M, Dp	3			
	Type Sprinklers	3 ft 10	2014	0	0	251	0	0	0	251	Triticale	8 Tons	Sudan Grass	7 Tons		C	S, S, S, S, S, S, S	M, M, M, Dp, M, Dp, M, Dp	2.4			
		4 ft 17	2013	0	225	0	0	0	0	225	Triticale	7 Tons	Corn Silage	24 Tons		D	S, S, S, S, S, S	M, M, M, Dp, M, Dp	3			
		5 ft 47	2012	0	0	0	0	0	0	0						E						
	Schedule Routine Schedule	6 ft 19	Comments No nutirents applied in 2015																			
	Hour Sets	TOTAL 128																				
	Current Years 2	NH4-N 44																				
Previous Years	ORGANIC 2.06																					
	PERCENT																					
	Previous Years																					

3097	Acres 60	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)										Cropping History					Soil 95 - Quincy Loamy Fine Sand 0-10% Slopes				
	Soil Testing? YES	10/16/2015	Year	Liquid	Solid	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2016	Hole	Consistance	Moisture	Roots	Refusal		
	Test Frequency Twice per year	1 ft 336	2016	0	0	0	0	0	0	0	Triticale	9 Tons			Crop Condition Good Planned	A	S, S, S, SH, S, S	M, M, M, M, M, M	1.4			
	Current Irrigation System	2 ft 363	2015	0	0	0	170	0	0	170	Triticale	9 Tons	Corn Silage	28 Tons		B	S, S, S, SH, S, S	M, M, M, M, M, M	1.1			
	Type Sprinklers	3 ft 335	2014	0	0	0	170	0	0	170	Triticale	9 Tons	Corn Silage	28 Tons		C	S, S, SH, S, S	M, M, M, M, M, M	1.5			
		4 ft 263	2013	0	0	0	170	0	0	170	Triticale	9 Tons	Corn Silage	28 Tons		D	S, S, S, SH, S, S	M, M, M, M, M, M	1.7			
		5 ft 113	2012	0	0	0	0	0	0	0						E						
	Schedule Routine Schedule	6 ft 64	Comments Bio solids applied in spring																			
	Hour Sets Check Soil	TOTAL 1474																				
	Current Years 7	NH4-N 28																				
Previous Years	ORGANIC 2.18																					
	PERCENT																					
	Previous Years																					

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3098	Acres	35	NO3 (#N/ACRE) 10/16/2015 1 ft 35 2 ft 11 3 ft 16 4 ft 12 5 ft 24 6 ft 15 TOTAL 113 NH4-N 40 ORGANIC PERCENT 1.46	Fertilizer Applications (#N/Acre)							Cropping History						Soil 172 - Warden Fine Sandy Loam 0-2% Slopes				
	Soil Testing?	YES		Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2015	Hole	Consistance	Moisture	Roots	Refusal
	Test Frequency	Once per Year		2016	0	0	0	0	0	0	0					Crop Condition	A	S	M	2.5	
	Current Irrigation System			2015	0	0	100	0	0	0	100	Wheat	9 Tons			Good	B	S	M	2.1	
	Type	Sprinklers		2014	0	0	100	0	0	0	100	Wheat	9 Tons	Sudan Grass	4 Tons	Actual	C	S	M	2.3	
	Schedule	Routine Schedule		2013	0	0	100	0	0	0	100	Wheat	9 Tons	Sudan Grass	4 Tons	D	S	M	2.8		
	Hour Sets	24		2012	0	0	0	0	0	0	0				E						
	Current Years	20		Comments	Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented																
	Previous Irrigation System			Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet																	
	Type																				
Previous Years																					

3099	Acres	40	NO3 (#N/ACRE) 10/16/2015 1 ft 179 2 ft 151 3 ft 77 4 ft 54 5 ft 90 6 ft 56 TOTAL 607 NH4-N 15 ORGANIC PERCENT 1.65	Fertilizer Applications (#N/Acre)							Cropping History						Soil 32 - Esquatzel Silt Loam 0-2%Slopes				
	Soil Testing?	YES		Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2015	Hole	Consistance	Moisture	Roots	Refusal
	Test Frequency	Once per Year		2016	0	0	0	0	0	0	0					Crop Condition	A	S, S, S, S, S	D, M, M, M, M	2	
	Current Irrigation System			2015	0	0	200	0	0	0	200	Corn Silage	28 Tons			Fair	B	S, S, S, S, S	D, M, M, M, M	2	
	Type	Sprinklers		2014	0	0	200	0	0	0	200	Corn Silage	28 Tons			Actual	C	S, S, S, S, S, S	D, M, M, M, M, M	2.4	
	Schedule	Routine Schedule		2013	0	0	200	0	0	0	200	Corn Silage	28 Tons			D	S, S, S, S, S	D, M, M, M, M	2.2		
	Hour Sets	Check the Soil		2012	0	0	0	0	0	0	0				E						
	Current Years	30		Comments	Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented																
	Previous Irrigation System			Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet																	
	Type																				
Previous Years																					

3100	Acres	35	NO3 (#N/ACRE) 10/18/2015 1 ft 79 2 ft 41 3 ft 68 4 ft 76 5 ft 61 6 ft 27 TOTAL 352 NH4-N 22 ORGANIC PERCENT 1.4	Fertilizer Applications (#N/Acre)							Cropping History						Soil 174 - Warden Fine Sandy Loam 5-8% Slopes				
	Soil Testing?	YES		Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2015	Hole	Consistance	Moisture	Roots	Refusal
	Test Frequency	Once per Year		2016	0	0	0	0	0	0	0					Crop Condition	A	S	M	3.4	
	Current Irrigation System			2015	0	0	200	0	0	0	200	Corn Silage	30 Tons			Good	B	S	M	3.3	
	Type	Rill Irrigation		2014	0	0	200	0	0	0	200	Corn Silage	30 Tons			Actual	C	S	M	3.3	
	Schedule	Routine Schedule		2013	0	0	200	0	0	0	200	Corn Silage	30 Tons			D	S	M	3.7		
	Hour Sets	Check the soil		2012	0	0	0	0	0	0	0				E						
	Current Years			Comments	Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented																
	Previous Irrigation System			Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet																	
	Type	Sprinklers - Pivot																			
Previous Years																					

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3101	Acres 20	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)							Cropping History				Soil 177 - Warden Silt Loam 2-5% Slopes						
	Soil Testing? YES	10/18/2015	Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2015	Hole	Consistance	Moisture	Roots	Refusal
	Test Frequency Once per Year	1 ft 54	2016	0	0	0	0	0	0	0					Crop Condition Good	A	S	M	2.4	
	Current Irrigation System	2 ft 9	2015	0	0	0	0	0	0	0						B	S	M	1.3	
	Type Sprinklers	3 ft 5	2014	0	0	0	0	0	0	0						C	S	M	1.3	
	Schedule Routine Schedule	4 ft 7	2013	0	0	60	0	0	0	60						D	S	M	1.8	
	Hour Sets 12	5 ft 22	2012	0	0	0	0	0	0	0						E				
	Current Years 20	6 ft 18	Comments 120 mature milking cows 6 hours a day																	
	Previous Irrigation System	TOTAL 115														Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented				
	Type Sprinklers - Hand Lines	NH4-N 46														Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet				
Previous Years	ORGANIC PERCENT 2.38																			

3102	Acres 55	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)							Cropping History				Soil 32 - Esquatzel Silt Loam 0-2%Slopes						
	Soil Testing? YES	10/18/2015	Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2016	Hole	Consistance	Moisture	Roots	Refusal
	Test Frequency Twice per year	1 ft 46	2016	0	0	0	0	0	0	0	Alfalfa	10 Tons			Crop Condition Good Planned	A	S	M	1.3	4
	Current Irrigation System	2 ft 17	2015	10	0	0	0	0	0	10	Alfalfa	10 Tons				B	S	M	1	4
	Type Sprinklers	3 ft 13	2014	0	0	0	0	0	0	0	Triticale	8 Tons	Sudan Grass	6 Tons		C	S	M	1.2	4
	Schedule Routine Schedule	4 ft 52	2013	0	0	0	0	48	0	48	Corn Silage	29 Tons	Triticale	8 Tons		D	S	M	1.8	4
	Hour Sets Check the soil	5 ft	2012	0	0	0	0	0	0	0						E				
	Current Years 7	6 ft	Comments The 8 ton per acre compost application = 48 lbs of N applied per acre; No nutirents applied in 2014.																	
	Previous Irrigation System	TOTAL 128														Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented				
	Type Rill Irrigation	NH4-N 27														Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet				
Previous Years	ORGANIC PERCENT 2.89																			

3103	Acres 65	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)							Cropping History				Soil 178 - Warden Silt Loam 5-8% Slopes						
	Soil Testing? NO	10/20/2015	Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2015	Hole	Consistance	Moisture	Roots	Refusal
	Test Frequency N/A	1 ft 12	2016	0	0	0	0	0	0	0					Crop Condition Good Actual	A	S, S, S, S, S, S	M, M, M, M, M, M	1.9	
	Current Irrigation System	2 ft 4	2015	30	0	0	0	0	0	30	Grass hay	2.5 Tons	Cows			B	S, S, S, SH, S, S, S	M, M, M, M, M, M, M	1.9	
	Type Sprinklers	3 ft 7	2014	30	0	0	0	0	0	30	Grass hay	2.5 Tons	Cows			C	S, S, S, S, S, S	M, M, M, M, M, M	1.8	
	Schedule Sprinklers	4 ft 5	2013	30	0	0	0	0	0	30	Grass hay	2.5 Tons	Cows			D	S, S, S, S, S	M, M, M, M, M, M	2.5	
	Hour Sets 24	5 ft 7	2012	30	0	0	0	0	0	30	Grass hay	2.5 Tons	Cows			E				
	Current Years 25	6 ft 3	Comments Split application; 15 lbs N per Acre in Spring, 15 lbs N per Acre in fall																	
	Previous Irrigation System	TOTAL 38														Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented				
	Type Not Sure	NH4-N 19														Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet				
Previous Years	ORGANIC PERCENT 1.73																			

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3104	Acres 80	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)										Cropping History					Soil 120 - Scoon Silt Loam 2-5% Slopes				
	Soil Testing? NO	10/20/2015	Year	Liquid	Solid	Com.	Bio	Comp	Other	Total												
	Test Frequency N/A	1 ft 17		Manure	Manure																	
	Current Irrigation System	2 ft 3	2016	0	0	0	0	0	0	0												
	Type Sprinklers	3 ft 3	2015	30	0	0	0	0	0	30	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2015	Hole	Consistance	Moisture	Roots	Refusal		
		4 ft 3	2014	30	0	0	0	0	0	30					Fair	A	SH, SH, SH, SH	M, M, Dp, Dp	2.2	3.2		
	Schedule Routine Schedule	5 ft	2013	30	0	0	0	0	0	30	Grass Hay	2.5 Tons	Cows			B	SH, SH	M, M	2.9	3.1		
		6 ft	2012	30	0	0	0	0	0	30	Grass Hay	2.5 Tons	Cows			C	SH, SH, SH	M, M, Dp	2.3	3		
	Hour Sets 24	TOTAL 26	Comments	Split application; 15 lbs N per Acre in Spring, 15 lbs N per Acre in fall; Because of drought, no hay was made in the 2015 Season. Only 100 beef cows in August grazed off pasture.												D	SH, SH, SH	M, M, Dp	2.2	3.6		
	Current Years 20	NH4-N 28														E						
Previous Irrigation System	ORGANIC 2.42														Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented							
Type Not sure	PERCENT														Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet							
Previous Years																						

3105	Acres 20	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)										Cropping History					Soil 18 - Cleman Very Fine Sandy Loam 0-2% Slopes				
	Soil Testing? YES	10/21/2015	Year	Liquid	Solid	Com.	Bio	Comp	Other	Total												
	Test Frequency Once per Year	1 ft 371		Manure	Manure																	
	Current Irrigation System	2 ft 58	2016	0	0	0	0	0	0	0	Triticale	10 Tons										
	Type Rill Irrigation	3 ft 18	2015	0	200	0	0	0	0	200	Corn Silage	30 Tons			2016	Hole	Consistance	Moisture	Roots	Refusal		
		4 ft 9	2014	0	200	0	0	0	0	200	Corn Silage	25 Tons			Good	A	S, FI, FI, FI	M, Dp, Dp, Dp	1.4			
	Schedule Routine Schedule	5 ft 20	2013	0	200	0	0	0	0	200	Corn Silage	28 Tons				B	S, FI, FI, FI, S	M, Dp, Dp, Dp, M	1.7			
		6 ft 68	2012	0	0	0	0	0	0	0						C	S, FI, FI, FI, FI, FI	M, Dp, Dp, Dp, Dp, Dp	1.3			
	Hour Sets Check soil	TOTAL 544	Comments	Nutrients applied in the spring; Note irrigation - uses Rill on Corn and Wheel-line for triticale												D	S, FI, FI, FI, FI, FI	M, Dp, Dp, Dp, Dp, Dp	1.3			
	Current Years 30	NH4-N 67														E						
Previous Irrigation System	ORGANIC 1.83														Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented							
Type	PERCENT														Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet							
Previous Years																						

3106	Acres 35	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)										Cropping History					Soil 32 - Esquatel Silt Loam 0-2% Slopes				
	Soil Testing? YES	10/21/2015	Year	Liquid	Solid	Com.	Bio	Comp	Other	Total												
	Test Frequency Twice per year	1 ft 316		Manure	Manure																	
	Current Irrigation System	2 ft 445	2016	150	0	0	0	0	0	150	Triticale	10 Tons										
	Type Sprinklers	3 ft 465	2015	300	0	0	0	0	0	300	Triticale	9 Tons	Corn Silage	37 Tons		A	S, S, S, S, FI, FI	M, M, M, M, M, M	1.4			
		4 ft 248	2014	300	0	0	0	0	0	300	Triticale	8 Tons	Corn Silage	41 Tons	Good	B	S, S, S, S, FI, FVI	M, M, M, M, M, M	3.2			
	Schedule Routine Schedule	5 ft 256	2013	300	0	0	0	0	0	300	Triticale	10 Tons	Corn Silage	36 Tons		C	S, S, S, S, FI, FVI	M, M, M, M, M, M	3.4			
		6 ft 222	2012	0	0	0	0	0	0	0						D	S, S, S, S, VFI	M, M, M, M, M, M	3.1			
	Hour Sets Check Soil	TOTAL 1952	Comments	Split application 150 lbs N in Spring 150 lbs N in Fall												E						
	Current Years 14	NH4-N 15														Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented						
Previous Irrigation System	ORGANIC 0.95														Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet							
Type Rill Irrigation	PERCENT																					
Previous Years																						

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3107	Acres 35	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)							Cropping History					Soil 138 - Sinloc Fine Sandy Loam 0-2% Slopes					
	Soil Testing? YES	10/21/2015	Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2016	Hole	Consistance	Moisture	Roots	Refusal
	Test Frequency Twice per year	1 ft 96	2016	0	0	0	0	0	0	0	Triticale	10 Tons			Crop Condition Fair Planned	A	S, S, Fl, S	M, M, M, Dp	3.2	
	Current Irrigation System	2 ft 70	2015	127	0	0	0	0	0	127	Corn Silage	26 Tons				B	S, S, Fl, S	M, M, M, Dp	2.8	
	Type Sprinklers	3 ft 164	2014	0	0	0	0	0	0	0						C	S, S, Fl, S	M, M, M, Dp	3.2	
	Schedule Blank	4 ft 182	2013	0	0	0	0	0	0	0						D	S, S, Fl, S	M, M, M, Dp	3.3	
	Hour Sets	5 ft 120	2012	0	0	0	0	0	0	0						E				
	Current Years 10	6 ft 44	Comments Only one year of history available, but there is a known history of annual manure application																	
	Previous Irrigation System	TOTAL 676																		
	Type Rill Irrigation	NH4-N 22																		
Previous Years	ORGANIC PERCENT 2.48																			
Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, Fl=Firm, VFI=Very Firm, C=Cemented																				
Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet																				

3108	Acres 24	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)							Cropping History					Soil 138 - Sinloc Fine Sandy Loam 0-2% Slopes					
	Soil Testing? YES	10/21/2015	Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2016	Hole	Consistance	Moisture	Roots	Refusal
	Test Frequency Twice per year	1 ft 311	2016	211	0	0	0	0	0	211	Triticale	10 Tons			Crop Condition Fair Planned	A	S, S	M, M	2.5	
	Current Irrigation System	2 ft 465	2015	82	0	150	0	0	0	232	Triticale	8 Tons	Corn Silage	28 Tons		B	S, Fl, S, S	M, M, M, M	3.4	
	Type Sprinklers	3 ft 612	2014	0	0	0	0	0	0	0						C	S, Fl, VFI, S	M, M, M, M	1.4	
	Schedule Watch the corn	4 ft 684	2013	0	0	0	0	0	0	0						D	S, Fl, VFI, Fl, S	M, M, M, M, M	3	
	Hour Sets	5 ft 247	2012	0	0	0	0	0	0	0						E				
	Current Years 10	6 ft 264	Comments 82 lbs N thru pivot onto triticale in spring, 150 N thru pivot for corn crop. Only one year history available but field has had a history of annual manure application.																	
	Previous Irrigation System	TOTAL 2583																		
	Type Rill Irrigation	NH4-N 27																		
Previous Years	ORGANIC PERCENT 2.66																			
Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, Fl=Firm, VFI=Very Firm, C=Cemented																				
Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet																				

3109	Acres 36	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)							Cropping History					Soil 174 - Warden Fine Sandy Loam 5-8% Slopes					
	Soil Testing? YES	10/21/2015	Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2016	Hole	Consistance	Moisture	Roots	Refusal
	Test Frequency Twice per year	1 ft 82	2016	31	0	0	0	0	0	31	Triticale	10 Tons			Crop Condition Good Planned	A	S	M	4.5	
	Current Irrigation System	2 ft 60	2015	29	0	150	0	0	0	179	Triticale	8 Tons	Corn Silage	29 Tons		B	S	M	2.6	
	Type Sprinklers	3 ft 223	2014	0	0	0	0	0	0	0						C	S	M	3.5	4
	Schedule Blank	4 ft 238	2013	0	0	0	0	0	0	0						D	S	M	3.8	4
	Hour Sets	5 ft 56	2012	0	0	0	0	0	0	0						E				
	Current Years 10	6 ft 100	Comments All nutrients applied thru the pivot. Only one year history available, but field has a known history of having manure applied on a annual basis.																	
	Previous Irrigation System	TOTAL 759																		
	Type Sprinklers - Wheel Lines	NH4-N 12																		
Previous Years	ORGANIC PERCENT 1.48																			
Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, Fl=Firm, VFI=Very Firm, C=Cemented																				
Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet																				

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3110	Acres 32	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)										Cropping History					Soil 177 - Warden Silt Loam 2-5% Slopes				
	Soil Testing? YES	10/22/2015	Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2016	Hole	Consistance	Moisture	Roots	Refusal		
	Test Frequency Twice per year	1 ft 93	2016	100	0	0	0	0	0	100	Triticale	11 Tons			Crop Condition Good Planned	A	S, S, FI	M, M, M	4.9			
	Current Irrigation System	2 ft 100	2015	280	0	60	0	0	0	340	Triticale	11.6 Tons	Corn Silage	38 Tons		B	S, S, FI	M, M, M	3.5			
	Type Sprinklers	3 ft 125	2014	300	0	125	0	0	0	425	Triticale	11 Tons	Corn Silage	34 Tons		C	S, S, FI	M, M, M	4.3			
		4 ft 154	2013	280	0	50	0	0	0	330	Triticale	12 Tons	Corn Silage	30 Tons		D	S, S, FI, S	M, M, M, M	4.2			
	Schedule Routine Schedule	5 ft 283	2012	0	0	0	0	0	0	0						E						
		6 ft 413	Comments Split application of liquid manure, half in fall and half in spring										Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented									
	Hour Sets Check soil	TOTAL 1168											Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet									
	Current Years 11	NH4-N 34																				
Previous Irrigation System	ORGANIC 2.19																					
Type Rill Irrigation	PERCENT																					
Previous Years																						

3111	Acres 40	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)										Cropping History					Soil 121 - Scoon Silt Loam 5-8% Slopes				
	Soil Testing? YES	10/22/2015	Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2016	Hole	Consistance	Moisture	Roots	Refusal		
	Test Frequency Twice per year	1 ft 35	2016	170	0	0	0	0	0	170	Triticale	10 Tons			Crop Condition Good Planned	A	S, HA	M, M	1.2	1.6		
	Current Irrigation System	2 ft 45	2015	300	0	0	0	0	0	300	Triticale	12.5 Tons	Corn Silage	17.8 Tons		B	S, HA	M, M	1.1	1.1		
	Type sprinklers	3 ft	2014	300	0	0	0	0	0	300	Triticale	18 Tons	Corn Silage	30 Tons		C	S, HA	M, M	1.2	1.5		
		4 ft	2013	300	0	75	0	0	0	375	Triticale	15 Tons	Corn Silage	33.3 Tons		D	S	M	0.9	1		
	Schedule Routine Schedule	5 ft	2012	0	0	0	0	0	0	0						E						
		6 ft	Comments Split application of liquid manure 150 lbs in fall 150 lbs in spring										Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented									
	Hour Sets check soil	TOTAL 80											Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet									
	Current Years 10	NH4-N 24																				
Previous Irrigation System	ORGANIC 1.59																					
Type Drip	PERCENT																					
Previous Years																						

3112	Acres 66	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)										Cropping History					Soil 177 - Warden Silt Loam 2-5% Slopes				
	Soil Testing? YES	10/22/2015	Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2016	Hole	Consistance	Moisture	Roots	Refusal		
	Test Frequency Twice per year	1 ft 39	2016	75	0	0	0	0	0	75	Triticale	10 Tons			Crop Condition Good Planned	A	S	M	2.4			
	Current Irrigation System	2 ft 73	2015	75	0	85	0	0	0	160	Triticale	12 Tons	Corn Silage	35.6 Tons		B	S	M	1.7			
	Type Sprinklers	3 ft 87	2014	75	0	40	0	0	0	115	Triticale	10 Tons	Corn Silage	32.3 Tons		C	S	M	3.4			
		4 ft 95	2013	75	0	0	0	0	0	75	Triticale	11 Tons	Corn Silage	30 Tons		D	S	M	2.2	5.7		
	Schedule Routine Schedule	5 ft 47	2012	0	0	0	0	0	0	0						E						
		6 ft 38	Comments Liquid manure fall application on triticale commerical N side dress with corn planting										Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented									
	Hour Sets check soil	TOTAL 379											Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet									
	Current Years 8	NH4-N 22																				
Previous Irrigation System	ORGANIC 1.87																					
Type Sprinklers - Wheel Lines	PERCENT																					
Previous Years																						

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3113	Acres	74	NO3 (#N/ACRE) 10/22/2015 1 ft 49 2 ft 150 3 ft 308 4 ft 308 5 ft 340 6 ft 280 TOTAL 1435 NH4-N 19 ORGANIC 1.71 PERCENT	Fertilizer Applications (#N/Acre)										Cropping History				16 Crop Condition Good Planned	Soil 178 - Warden Silt Loam 5-8% Slopes				
	Soil Testing?	YES		Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Hole	Consistance		Moisture	Roots	Refusal		
	Test Frequency	Twice a Year		2016	0	0	0	0	0	0	0	Alfalfa	10 Tons			A	S, S, S, FI, Si		M, M, M, M, M	6			
	Current Irrigation System			2015	75	0	0	0	0	0	75	Alfalfa	10 Tons			B	S, S, S, FI, S, S		M, M, M, M, M, M	5.2			
	Type	Sprinklers		2014	75	0	0	0	0	0	75	Triticale	10 Tons	Alfalfa	4.2 Tons	C	S, S, S		M, M, M	5	5		
	Schedule	Routine Schedule		2013	75	0	45	0	0	0	120	Triticale	11 Tons	Corn Silage	30 Tons	D	S, S, S		M, M, M	4	4		
	Hour Sets	Check Soil		2012	75	0	0	0	0	0	75					E							
	Current Years	8		Comments	Liquid manure fall application										Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented								
	Previous Irrigation System													Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet									
	Type	Sprinklers - Wheel-line																					
Previous Years																							

3114	Acres	36	NO3 (#N/ACRE) 10/22/2015 1 ft 131 2 ft 22 3 ft 36 4 ft 18 5 ft 28 6 ft 31 TOTAL 266 NH4-N 10 ORGANIC 1.55 PERCENT	Fertilizer Applications (#N/Acre)										Cropping History				2015 Crop Condition Good Actual	Soil 177 - Warden Silt Loam 2-5% Slopes				
	Soil Testing?	YES		Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Hole	Consistance		Moisture	Roots	Refusal		
	Test Frequency	Twice a Year - Fall		2016	0	0	0	0	0	0	0					A	S, S, FI, S, S, L		D, M, M, M, M, M	1.8			
	Current Irrigation System			2015	0	100	0	0	0	0	100	Corn Silage	34 Tons			B	S, S, FI, L, FI, L, S, L		D, M, M, M, M, M, M, M	3.3			
	Type	Rill Irrigation		2014	0	150	0	0	0	0	150	Corn Silage	35 Tons			C	S, S, FI, S, FI		D, M, M, M, M, M	2.4			
	Schedule	Routine Schedule		2013	0	200	0	0	0	0	200	Corn Silage	31 Tons			D	S, S, S, L, S, FI		D, M, M, M, M, M	3.4			
	Hour Sets	8-Day Rotation		2012	0	0	0	0	0	0	0	Corn Silage	27 Tons			E							
	Current Years	100		Comments											Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented								
	Previous Irrigation System													Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet									
	Type	Unknown																					
Previous Years																							

3115	Acres	40	NO3 (#N/ACRE) 10/22/2015 1 ft 82 2 ft 90 3 ft 149 4 ft 111 5 ft 192 6 ft 195 TOTAL 819 NH4-N 14 ORGANIC 1.67 PERCENT	Fertilizer Applications (#N/Acre)										Cropping History				2016 Crop Condition Good Planned	Soil 179 - Warden Silt Loam 8-15% Slopes				
	Soil Testing?	YES		Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Hole	Consistance		Moisture	Roots	Refusal		
	Test Frequency	Twice per year		2016	150	0	0	0	0	0	150	Triticale	10 Tons			A	S, FI, S		M, M, M	1.9	4		
	Current Irrigation System			2015	300	0	0	0	0	0	300	Triticale	10 Tons	Sorgummilo	18 Tons	B	S, FI, S, FI, S, FI		M, M, M, M, M, M	3.2			
	Type	Sprinklers		2014	300	0	0	0	0	0	300	Triticale	18 Tons	Corn Silage	30 Tons	C	S, S, FI, S, FI, VFI, S		M, M, M, M, M, M, M	2.9			
	Schedule	Routine Schedule		2013	300	0	75	0	0	0	375	Triticale	14 Tons	Corn Silage	33 Tons	D	S, S, FI, S, S, S, VFI		M, M, M, M, M, M, M	2.5			
	Hour Sets			2012	0	0	0	0	0	0	0					E							
	Current Years	10		Comments	Split application of liquid manure, 150 lbs N in spring, 150 lbs N in fall										Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented								
	Previous Irrigation System													Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet									
	Type	Rill Irrigation																					
Previous Years																							

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3116	Acres 30	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)										Cropping History				Soil 176 - Warden Silt Loam 0 to 2 percent slopes				
	Soil Testing? YES	10/25/2015	Year	Liquid	Solid	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2015	Hole	Consistance	Moisture	Roots	Refusal	
	Test Frequency One a Year	1 ft 271		Manure	Manure																
	Current Irrigation System	2 ft 489	2016	0	0	0	0	0	0	0											
	Type Rill Irrigation	3 ft 113	2015	50	0	150	0	0	0	200	Corn	180 Bushels									
		4 ft 56	2014	50	0	150	0	0	0	200	Corn	180 Bushels									
	Schedule Look at Crop and Soil	5 ft 55	2013	50	0	150	0	0	0	200	Corn	180 Bushels									
		6 ft 49	2012	0	0	0	0	0	0	0	Corn	25 Bushels									
	Hour Sets	TOTAL 1033	Comments																		
	Current Years 65	NH4-N 23																			
Previous Irrigation System	ORGANIC 3.04																				
Type	PERCENT																				
Previous Years																					
3117	Acres 36	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)										Cropping History				Soil 177 - Warden Silt Loam 2-5% Slopes				
	Soil Testing? YES	10/25/2015	Year	Liquid	Solid	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2015	Hole	Consistance	Moisture	Roots	Refusal	
	Test Frequency Once per Year	1 ft 51		Manure	Manure																
	Current Irrigation System	2 ft 301	2016	0	0	0	0	0	0	0	Grapes	6 Tons									
	Type Sprinklers	3 ft 573	2015	0	0	0	0	0	0	0	Grapes	6 Tons									
		4 ft 400	2014	0	0	0	0	0	0	0	Grapes	9 Tons									
	Schedule Blank	5 ft	2013	0	0	0	0	0	0	0	Grapes	6 Tons									
		6 ft	2012	0	0	0	0	0	0	0											
	Hour Sets	TOTAL 1325	Comments	This is an organic grape vineyard. We use vetch legume with triticale as a cover crop and the vetch does nitrogen fixing.																	
	Current Years 5	NH4-N 9																			
Previous Irrigation System	ORGANIC 1.67																				
Type Rill Irrigation	PERCENT																				
Previous Years																					
3118	Acres 45	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)										Cropping History				Soil 177 - Warden Silt Loam 2-5% Slopes				
	Soil Testing? NO	10/25/2015	Year	Liquid	Solid	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2015	Hole	Consistance	Moisture	Roots	Refusal	
	Test Frequency N/A	1 ft 87		Manure	Manure																
	Current Irrigation System	2 ft 51	2016	0	0	0	0	0	0	0											
	Type Sprinklers	3 ft	2015	0	0	70	0	0	0	70	Apples	53 Bins									
		4 ft	2014	0	0	50	0	0	0	50	Apples	55 Bins									
	Schedule Check the soil	5 ft	2013	0	0	50	0	0	0	50	Apples	50 Bins									
		6 ft	2012	0	0	0	0	0	0	0	Apples	50 Bins									
	Hour Sets	TOTAL 138	Comments																		
	Current Years 25	NH4-N 14																			
Previous Irrigation System	ORGANIC 3.06																				
Type rill Irrigation before it became an orchard	PERCENT																				
Previous Years																					

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3119	Acres	15	NO3 (#N/ACRE) 10/25/2015 1 ft 20 2 ft 213 3 ft 260 4 ft 213 5 ft 559 6 ft 580 TOTAL NH4-N 11 ORGANIC 1.49 PERCENT	Fertilizer Applications (#N/Acre)										Cropping History					Soil 179 - Warden Silt Loam 8-15% Slopes	
	Soil Testing?	YES		Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2015				
	Test Frequency	Every 2 Years		2016	0	0	0	0	0	0	0	Grapes	9.5 Tons			Crop Condition Good Actual				
	Current Irrigation System	Sprinklers		2015	0	0	50	0	0	0	50	Grapes	6 Tons							
	Type			2014	0	0	50	0	0	0	50	Grapes	4 Tons							
	Schedule	Check Soil		2013	0	0	50	0	0	0	50	Grapes	4 Tons							
	Hour Sets			2012	0	0	0	0	0	0	0	Grapes	10.5 Tons							
	Current Years	10		Comments	Previous farmer 40 years ago had a history of excessive nitrogen application according to current farmer										Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet					
	Previous Irrigation System	Rill Irrigation																		
	Type																			
Previous Years																				

3120	Acres	35	NO3 (#N/ACRE) 10/25/2015 1 ft 13 2 ft 143 3 ft 4 ft 5 ft 6 ft TOTAL 156 NH4-N 12 ORGANIC 1.35 PERCENT	Fertilizer Applications (#N/Acre)										Cropping History					Soil Hole Consistance Moisture Roots Refusal	
	Soil Testing?	YES		Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2015				
	Test Frequency	Every Other Year		2016	0	0	0	0	0	0	0					Crop Condition Good Actual				
	Current Irrigation System	Sprinkler		2015	0	0	50	0	0	0	50	Grapes	10 Tons							
	Type			2014	0	0	50	0	0	0	50	Grapes	8 Tons							
	Schedule	Check soil		2013	0	0	50	0	0	0	50	Grapes	4 Tons							
	Hour Sets			2012	0	0	0	0	0	0	0	Grapes	10 Tons							
	Current Years	10		Comments											Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet					
	Previous Irrigation System	Rill Irrigation																		
	Type																			
Previous Years																				

3121	Acres	40	NO3 (#N/ACRE) 10/25/2015 1 ft 275 2 ft 193 3 ft 162 4 ft 137 5 ft 202 6 ft 272 TOTAL 1241 NH4-N 32 ORGANIC 2.91 PERCENT	Fertilizer Applications (#N/Acre)										Cropping History					Soil 139 - Sinloc Silt Loam 0-2% Slopes	
	Soil Testing?	YES		Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2016				
	Test Frequency	Twice per year		2016	0	0	0	0	0	0	0	Triticale	8 Tons			Crop Condition Good Planned				
	Current Irrigation System	Sprinklers		2015	0	0	0	0	0	0	0	Triticale	6.7 Tons	Corn Silage	29 Tons					
	Type			2014	137	0	0	0	0	0	137	Triticale	6.7 Tons	Corn Silage	29 Tons					
	Schedule	Soil Moisture Sensors		2013	293	0	0	0	0	0	293	Triticale	6.6 Tons	Corn Silage	29 Tons					
	Hour Sets			2012	0	0	0	0	0	0	0									
	Current Years	17		Comments	No nutirents applied in 2015.										Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet					
	Previous Irrigation System	Rill Irrigation																		
	Type																			
Previous Years																				

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ID	Acres	Soil Testing?	Test Frequency	Current Irrigation System	Type	Schedule	Hour Sets	Current Years	Previous Irrigation System	Type	Previous Years	NO3 (#N/ACRE) 10/25/2015	Fertilizer Applications (#N/Acre)								Cropping History				2016	Crop Condition	Soil 32 - Esquatzel Silt Loam 0-2% Slopes				
													Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield			Hole	Consistance	Moisture	Roots	Refusal
3122	80	YES	Twice per year		Rill Irrigation and Sprinklers	Routine Schedule	24	30				101	2016	0	0	0	0	0	0	0	Triticale	8 Tons			Good	A	S, FI, FI, FI, S	M, M, Dp, W, M	1.2		
												1 ft	2015	0	0	215	0	0	0	215	Triticale	9 Tons	Corn Silage	25 Tons	Planned	B	S, FI, FI, FI, S	M, M, Dp, W, M	1.1		
												2 ft	2014	0	0	60	0	0	0	60	Corn Silage	28 Tons				C	S, FI, FI, FI, S	M, M, Dp, W, M	1.4		
												3 ft	2013	0	0	140	0	0	0	140	Corn Silage	30 Tons				D	S, FI, FI, FI, S	M, M, Dp, W, M	1.1		
												4 ft	2012	0	0	0	0	0	0	0						E					
												5 ft	Comments: Comment on Sprinklers - For triticale sprinkles 24 hour sets for corn move ditches every 2 hours. Rill forever sprinklers started 5 years ago. Rill for corn, sprinklers for triticale.														Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented				
												6 ft															Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet				
												TOTAL																			
												NH4-N																			
												ORGANIC PERCENT																			
3123	40	YES	Once a Year		Rill Irrigation	Every 8 days		100				435	2016	0	0	0	0	0	0	0					Fair	A					
												1 ft	2015	200	0	0	0	0	0	200	Corn Silage	30 Tons			Actual	B					
												2 ft	2014	200	0	0	0	0	0	200	Corn Silage	26 Tons				C					
												3 ft	2013	200	0	0	0	0	0	200	Corn Silage	27 Tons				D					
												4 ft	2012	0	0	0	0	0	0	0	Corn Silage	26 Tons				E					
												5 ft	Comments: Every year														Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented				
												6 ft															Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet				
												TOTAL																			
												NH4-N																			
												ORGANIC PERCENT																			
3124	20	NO	N/A		Rill/Surface Irrigation	Routine Schedule	6x a year water					13	2016	0	17	0	0	0	0	17	Pasture				Fair	A	S, S, FI	M, M, Dp-W	1		
												1 ft	2015	0	17	0	0	0	0	17	Pasture					B	S, S, FI	M, M, Dp-W	3.4		
												2 ft	2014	0	17	0	0	0	0	17	Pasture					C	S, S, FI	M, M, Dp-W	2.6		
												3 ft	2013	0	17	0	0	0	0	17	Pasture					D	S, S, FI, FI	M, M, M, Dp-W	1.8		
												4 ft	2012	0	17	0	0	0	0	17	Pasture					E					
												5 ft	Comments: Only manure is from cows - .42 lbs of N per day per animal pair; 40 pair year around														Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented				
												6 ft															Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet				
												TOTAL																			
												NH4-N																			
												ORGANIC PERCENT																			

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3125	Acres 35 Soil Testing? NO Test Frequency N/A Current Irrigation System Type Sprinklers Schedule Routine Schedule Hour Sets 24 Current Years 16 Previous Irrigation System Type Rill Irrigation Previous Years	NO3 (#N/ACRE) 10/25/2015 1 ft 8 2 ft 4 3 ft 3 4 ft 5 ft 6 ft TOTAL 15 NH4-N 20 ORGANIC 0.9 PERCENT	Fertilizer Applications (#N/Acre) Year Liquid Solid Com. Bio Comp Other Total Manure Manure 2016 0 0 0 0 0 0 0 2015 0 0 210 0 0 0 210 2014 0 0 210 0 0 0 210 2013 0 0 210 0 0 0 210 2012 0 0 0 0 0 0 0 Comments Split application of N to the field	Cropping History				2015 Crop Condition Fair	Soil 177 - Warden Silt Loam 2-5% Slopes				
									Hole	Consistence	Moisture	Roots	Refusal
									A	S, S, S	M, M, M	1.6	3
									B	S, L, S	M, M, M	3.1	3.1
									C	S, S, FI, S	M, M, M, M	2	2
									D	S, S, FI, S	M, M, M, M	1.6	2
									E				
									Consistence Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented				
									Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet				

3126	Acres 16 Soil Testing? YES Test Frequency Twice per year Current Irrigation System Type Sprinklers Schedule Routine Schedule Hour Sets Check soil Current Years 1 Previous Irrigation System Type Sprinklers - Wheel Lines Previous Years	NO3 (#N/ACRE) 10/27/2015 1 ft 246 2 ft 104 3 ft 92 4 ft 126 5 ft 134 6 ft 140 TOTAL 842 NH4-N 30 ORGANIC 1.91 PERCENT	Fertilizer Applications (#N/Acre) Year Liquid Solid Com. Bio Comp Other Total Manure Manure 2016 40 0 0 0 0 0 40 2015 160 0 80 0 0 0 240 2014 40 0 0 0 0 0 40 2013 40 0 0 0 0 0 40 2012 0 0 0 0 0 0 0 Comments Split application of commercial N	Cropping History				2016 Crop Condition Good Planned	Soil 18 - Cleman Very Fine Sandy Loam 0-2% Slopes				
									Hole	Consistence	Moisture	Roots	Refusal
									A	S, S, S, S	M, M, Dp, W	2.7	
									B	S, S, S, S	M, M, Dp, W	2.5	
									C	S, S, S, S	M, M, Dp, W	1.7	
									D	S, S, S, S	M, M, Dp, W	2	
									E				
									Consistence Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented				
									Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet				

3127	Acres Soil Testing? Blank Test Frequency N/A Current Irrigation System Type Sprinklers Schedule Routine Schedule Hour Sets 24 Current Years Previous Irrigation System Type Previous Years	NO3 (#N/ACRE) 10/27/2015 1 ft 34 2 ft 22 3 ft 4 ft 5 ft 6 ft TOTAL 56 NH4-N 13 ORGANIC 2.27 PERCENT	Fertilizer Applications (#N/Acre) Year Liquid Solid Com. Bio Comp Other Total Manure Manure 2016 0 0 0 0 0 0 0 2015 40 0 0 0 0 0 40 2014 40 0 0 0 0 0 40 2013 40 0 0 0 0 0 40 2012 0 0 0 0 0 0 0 Comments Liquid manure applied thru wheel lines to field in Spring	Cropping History				2016 Crop Condition Good	Soil 173 - Warden Fine Sandy Loam 2-5% Slopes				
									Hole	Consistence	Moisture	Roots	Refusal
									A	S	M	1.8	2
									B	S	M	1.3	2
									C	S	M	1.6	2
									D	S	M	1	1
									E				
									Consistence Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented				
									Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet				

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	Acres	Soil Testing?	Test Frequency	Current Irrigation System	Schedule	Hour Sets	Current Years	Previous Irrigation System	Type	Previous Years	NO3 (#N/ACRE) 10/28/2015	Fertilizer Applications (#N/Acre)	Cropping History	2015	Hole	Consistance	Moisture	Roots	Refusal	Soil
3128	30	YES	Once per Year	Rill Irrigation	Routine Schedule	24														174 - Warden Fine Sandy Loam 5-8% Slopes
3129	30	YES	Once a Year	Rill Irrigation	check soil		30		Unknown											32 - Esquatzel Silt Loam 0-2% Slopes
3130	16	NO	N/A	Sprinklers	Routine Schedule	24	3													177 - Warden Silt Loam 2-5% Slopes

Deep Soil Sampling - Fall 2015

3131	Acres 35	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)										Cropping History				Soil 138 - Sinloc Fine Sandy Loam 0-2% Slopes				
	Soil Testing? YES	10/28/2015	Year	Liquid	Solid	Com.	Bio	Comp	Other	Total											
	Test Frequency Once per Year	1 ft 97		Manure	Manure						Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2015	Hole	Consistance	Moisture	Roots	Refusal	
	Current Irrigation System	2 ft 25	2016	0	0	0	0	0	0	0	Corn Silage	30 Tons			Crop Condition Good Actual	A	S, S, S, S	M, M, Dp, Dp	1.5		
	Type Rill Irrigation	3 ft 33	2015	0	250	100	0	0	0	350	Corn Silage	30 Tons				B	S, S, S, S, S	M, M, Dp, Dp, Dp	1.2		
	Schedule Routine Schedule	4 ft 14	2014	0	60	100	0	0	0	160	Corn Silage	30 Tons				C	S, S, S, S, S, S	M, M, Dp, Dp, M, Dp	2.1		
		5 ft 12	2013	0	0	100	0	0	0	100	Corn Silage	30 Tons				D	S, S, S, S	M, M, Dp, Dp	2.8		
		6 ft 11	2012	0	0	0	0	0	0	0						E					
	Hour Sets	TOTAL 192	Comments All nutrients applied in Spring										Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented								
	Current Years 100	NH4-N 58											Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet								
Previous Irrigation System	ORGANIC PERCENT 2.72																				
Type																					
Previous Years																					

3132	Acres 20	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)										Cropping History				Soil 58 - Hezel Loamy Fine Sand 2-15% Slopes				
	Soil Testing? YES	10/28/2015	Year	Liquid	Solid	Com.	Bio	Comp	Other	Total											
	Test Frequency Once a Year	1 ft 308		Manure	Manure						Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2015	Hole	Consistance	Moisture	Roots	Refusal	
	Current Irrigation System	2 ft 43	2016	0	0	0	0	0	0	0					Crop Condition Fair Actual	A	S, S	D, M	3.1	4	
	Type Rill Irrigation	3 ft 78	2015	0	100	100	0	0	0	200	Corn Silage	28 Tons				B	S, S, S	D, M, M	2.8		
	Schedule Check soil	4 ft 14	2014	0	100	100	0	0	0	200	Corn Silage	30 Tons				C	S, S, S	D, M, M	3.1		
		5 ft 43	2013	0	100	100	0	0	0	200	Corn Silage	25 Tons				D	S, S, S	D, M, M	3.2		
		6 ft 8	2012	0	100	100	0	0	0	200	Corn Silage	27 Tons				E					
	Hour Sets	TOTAL 494	Comments All nutrients applied in spring										Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented								
	Current Years 100	NH4-N 13											Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet								
Previous Irrigation System	ORGANIC PERCENT 1.78																				
Type Unknown																					
Previous Years																					

3133	Acres 30	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)										Cropping History				Soil 58 - Hezel Loamy Fine Sand 2-15% Slopes				
	Soil Testing? YES	10/28/2015	Year	Liquid	Solid	Com.	Bio	Comp	Other	Total											
	Test Frequency Once a Year	1 ft 170		Manure	Manure						Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2015	Hole	Consistance	Moisture	Roots	Refusal	
	Current Irrigation System	2 ft 97	2016	0	0	0	0	0	0	0					Crop Condition Fair Actual	A	S, S, S, S	M, M, M, M	2.6		
	Type Rill Irrigation	3 ft 53	2015	0	100	100	0	0	0	200	Corn Silage	24 Tons				B	S, S, S	M, M, M	1.8		
	Schedule Check soil	4 ft 24	2014	0	100	100	0	0	0	200	Corn Silage	27 Tons				C	S, S, S	M, M, M	2.9		
		5 ft 67	2013	0	100	100	0	0	0	200	Corn Silage	32 Tons				D	S, S, S, S, S	M, M, M, M, Dp	1.6		
		6 ft 59	2012	0	100	100	0	0	0	200	Corn Silage	27 Tons				E					
	Hour Sets	TOTAL 470	Comments All nutrients applied in spring										Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented								
	Current Years 100	NH4-N 16											Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet								
Previous Irrigation System	ORGANIC PERCENT 1.9																				
Type Unknown																					
Previous Years																					

Deep Soil Sampling - Fall 2015

3134	Acres 30	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)							Cropping History					Soil 57 - Hezel Loamy Fine Sand 0-2% Slopes					
	Soil Testing? YES	10/29/2015	Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2016	Hole	Consistance	Moisture	Roots	Refusal
	Test Frequency Once per Year	1 ft 10	2016	0	0	0	0	0	0	0	Mint	200 Lbs.			Crop Condition Good Planned	A	S	M	2.3	4
	Current Irrigation System	2 ft 14	2015	0	0	80	0	0	0	80	Mint	Lbs.				B	S	M	2.5	4
	Type Sprinklers	3 ft 76	2014	0	0	180	0	0	0	180	Corn	35 Tons				C	S	M	2	4
	Schedule Shovel	4 ft 74	2013	0	0	180	0	0	0	180	Corn	7.5 Tons				D	S	M	2.1	
	Hour Sets	5 ft 46	2012	0	0	0	0	0	0	0						E				
	Current Years 3	6 ft 48	Comments								Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet									
	Previous Irrigation System	TOTAL 268																		
	Type Rill Irrigation	NH4-N 11																		
Previous Years	ORGANIC PERCENT 1.42																			

3135	Acres 28	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)							Cropping History					Soil 57 - Hezel Loamy Fine Sand 0-2% Slopes					
	Soil Testing? YES	10/29/2015	Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2015	Hole	Consistance	Moisture	Roots	Refusal
	Test Frequency Once per Year	1 ft 225	2016	0	0	0	0	0	0	0	Corn Grain	28 Tons			Crop Condition Good Actual	A	S	M	1.2	4
	Current Irrigation System	2 ft 233	2015	0	50	200	0	0	0	250	Corn Grain	28 Tons				B	S	M	1.5	4
	Type Sprinklers	3 ft 219	2014	0	0	250	0	0	0	250	Corn Grain	7 Tons				C	S	M	1.1	3.2
	Schedule Observe Crop	4 ft 125	2013	0	0	200	0	0	0	200	Corn Grain	7 Tons				D	S	M	1.3	4
	Hour Sets	5 ft	2012	0	0	0	0	0	0	0						E				
	Current Years 3	6 ft	Comments Previously commercial N was broadcast on by now it is applied thru the growing season thru the pivot								Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet									
	Previous Irrigation System	TOTAL 802																		
	Type Rill Irrigation	NH4-N 20																		
Previous Years	ORGANIC PERCENT 2.14																			

3136	Acres 15	NO3 (#N/ACRE)	Fertilizer Applications (#N/Acre)							Cropping History					Soil 173 - Warden Fine Sandy Loam 2-5% Slopes					
	Soil Testing? Blank	10/29/2015	Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	2016	Hole	Consistance	Moisture	Roots	Refusal
	Test Frequency N/A	1 ft 50	2016	0	0	0	0	0	0	0	Mint	Lbs.			Crop Condition	A	S	M	2.4	
	Current Irrigation System	2 ft 6	2015	0	0	300	0	0	0	300	Mint	185 Lbs.				B	S	M		
	Type Rill Irrigation	3 ft 4	2014	0	0	300	0	0	0	300	Mint	195 Lbs.				C	S	M	2	
	Schedule Blank	4 ft 3	2013	0	0	300	0	0	0	300	Mint	180 Lbs.				D	S	M		
	Hour Sets	5 ft 10	2012	0	0	0	0	0	0	0						E				
	Current Years 50	6 ft 8	Comments 150 in spring, fly on 50lbs June 1st, July 10 add								Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet									
	Previous Irrigation System	TOTAL 81																		
	Type	NH4-N 20																		
Previous Years	ORGANIC PERCENT 1.85																			

Deep Soil Sampling - Fall 2015

3137	Acres	5	NO Soil Testing? Test Frequency N/A Current Irrigation System Type Rill Irrigation Schedule Routine Schedule Hour Sets Current Years 50 Previous Irrigation System Type Previous Years	NO3 (#N/ACRE) 10/29/2015 1 ft 56 2 ft 3 3 ft 7 4 ft 3 5 ft 7 6 ft 3 TOTAL 79 NH4-N 71 ORGANIC 1.75 PERCENT	Fertilizer Applications (#N/Acre)								Cropping History				2016 Crop Condition Good Planned	Soil 173 - Warden Fine Sandy Loam 2-5% Slopes				
	Year	Liquid Manure			Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Hole	Consistance		Moisture	Roots	Refusal		
	2016	0			0	0	0	0	0	0	Mint	188 Lbs.			A	S		M	2.4			
	2015	0			0	300	0	0	0	300	Mint	188 lbs of oil			B	S		M	2.4			
	2014	0			0	300	0	0	0	300	Mint	188 Lbs.			C	S		M	2.1			
	2013	0			0	300	0	0	0	300	Mint	188 Lbs.			D	S		M	1.9			
	2012	0			0	0	0	0	0	0					E							
	Comments								Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet													

3138	Acres	30	NO Soil Testing? Test Frequency N/A **Current Irrigation System** Type Rill Irrigation Schedule Routine Schedule Hour Sets Check soil to start Current Years 100 **Previous Irrigation System** Type Previous Years	NO3 (#N/ACRE) 10/29/2015 1 ft 15 2 ft 3 3 ft 7 4 ft 4 5 ft 43 6 ft 4 TOTAL 76 NH4-N 12 ORGANIC 0.84 PERCENT	Fertilizer Applications (#N/Acre)								Cropping History				2016 Crop Condition Good Planned	Soil 176 - Warden Silt Loam 0 to 2 percent slopes				
Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Hole	Consistance	Moisture	Roots	Refusal						
2016	0	0	0	0	0	0	0	Grapes	15 Tons			A	S	M	2	4						
2015	0	0	75	0	0	0	75	Grapes	11.3 Tons			B	S	M	2.2	4						
2014	0	0	75	0	0	0	75	Grapes	18 Tons			C	S	M	1.8							
2013	0	0	75	0	0	0	75	Grapes	12.5 Tons			D	S	M	2.6	4						
2012	0	0	0	0	0	0	0					E										
Comments								Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet														
Field has been in grapes since 1949																						
3139	Acres	60	NO Soil Testing? Test Frequency N/A **Current Irrigation System** Type Sprinklers Schedule Routine Schedule Hour Sets 24 Current Years 10 **Previous Irrigation System** Type Previous Years	NO3 (#N/ACRE) 10/29/2015 1 ft 5 2 ft 6 3 ft 30 4 ft 32 5 ft 6 ft TOTAL 73 NH4-N 10 ORGANIC 1.13 PERCENT	Fertilizer Applications (#N/Acre)								Cropping History				2016 Crop Condition Good Planned	Soil 177 - Warden Silt Loam 2-5% Slopes				
Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total	Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Hole	Consistance	Moisture	Roots	Refusal						
2016	0	0	0	0	0	0	0	Grapes	15 Tons			A	S	M	2.6	4						
2015	0	0	75	0	0	0	75	Grapes	11.3 Tons			B	S	M	1.8	4						
2014	0	0	75	0	0	0	75	Grapes	18 Tons			C	S	M	1.7	4						
2013	0	0	75	0	0	0	75	Grapes	12.5 Tons			D	S	M	3.2	4						
2012	0	0	0	0	0	0	0					E										
Comments								Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet														

Deep Soil Sampling - Fall 2015

3140	Acres 20	NO3 (#N/ACRE) 10/29/2015 1 ft 300 2 ft 4 3 ft 40 4 ft 17 5 ft 127 6 ft 5 TOTAL 493 NH4-N 22 ORGANIC 1.42 PERCENT	Fertilizer Applications (#N/Acre)								Cropping History				Soil 177 - Warden Silt Loam 2-5% Slopes					
	Soil Testing? YES		Year	Liquid	Solid	Com.	Bio	Comp	Other	Total					2016	Hole	Consistance	Moisture	Roots	Refusal
	Test Frequency Once per Year			Manure	Manure							Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield					
	Current Irrigation System		2016	0	0	0	0	0	0	0	Hops	1.5 Tons				Crop Condition Good Planned	A	S	M	2.4
	Type Drip		2015	0	0	200	0	0	0	200	Hops	1 Tons					B	S	M	2.5
			2014	0	0	200	0	0	0	200	Hops	1 Tons					C	S	M	2.7
	Schedule once system is on rotate thru year		2013	0	0	200	0	0	0	200	Hops	1 Tons					D	S	M	2
			2012	0	0	0	0	0	0	0							E			
	Hour Sets		Comments	Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented																
	Current Years 15			Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet																
Previous Irrigation System																				
Type Rill Irrigation																				
Previous Years																				

3141	Acres 20	NO3 (#N/ACRE) 10/29/2015 1 ft 950 2 ft 59 3 ft 596 4 ft 57 5 ft 1344 6 ft 1204 TOTAL 4210 NH4-N 22 ORGANIC 2.25 PERCENT	Fertilizer Applications (#N/Acre)								Cropping History				Soil 32 - Esquatzel Silt Loam 0-2%Slopes						
	Soil Testing? YES		Year	Liquid	Solid	Com.	Bio	Comp	Other	Total					2016	Hole	Consistance	Moisture	Roots	Refusal	
	Test Frequency Once per Year			Manure	Manure							Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield						
	Current Irrigation System		2016	0	0	0	0	0	0	0	Hops	1.5 Tons				Crop Condition Good Planned	A	S	M	2	
	Type Drip		2015	0	0	200	0	0	0	200	Hops	1 Tons					B	S	M	2.8	
			2014	0	0	200	0	0	0	200	Hops	1 Tons					C	S	M	2.1	5
	Schedule once system is on rotate thru year		2013	0	0	200	0	0	0	200	Hops	1 Tons					D	S	M	2.2	4
			2012	0	0	0	0	0	0	0							E				
	Hour Sets		Comments	Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented																	
	Current Years 15			Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet																	
Previous Irrigation System																					
Type Rill Irrigation																					
Previous Years																					

3142	Acres 20	NO3 (#N/ACRE) 10/29/2015 1 ft 820 2 ft 44 3 ft 149 4 ft 56 5 ft 6 ft TOTAL 1069 NH4-N 12 ORGANIC 1.85 PERCENT	Fertilizer Applications (#N/Acre)								Cropping History				Soil 32 - Esquatzel Silt Loam 0-2%Slopes						
	Soil Testing? YES		Year	Liquid	Solid	Com.	Bio	Comp	Other	Total					2016	Hole	Consistance	Moisture	Roots	Refusal	
	Test Frequency Once per Year			Manure	Manure							Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield						
	Current Irrigation System		2016	0	0	0	0	0	0	0						Crop Condition Good Planned	A	S	M	3.1	4
	Type Drip		2015	0	0	200	0	0	0	200	Hops	1.5 Tons					B	S	M	2.9	4
			2014	0	0	200	0	0	0	200	Hops	1.5 Tons					C	S	M	3.1	4
	Schedule once system is on rotate thru year		2013	0	0	200	0	0	0	200	Hops	1.5 Tons					D	S	M	2.8	4
			2012	0	0	0	0	0	0	0							E				
	Hour Sets		Comments	Consistance Options: L=loose, S=Soft, SH=Slightly Hard, HA=Hard, EH=Extremely Hard, FR=Friable, FI=Firm, VFI=Very Firm, C=Cemented																	
	Current Years 15			Moisture Options: D=Dry, M=Moist, Dp=Damp, W=Wet																	
Previous Irrigation System																					
Type Rill Irrigation																					
Previous Years																					

Technical Memorandum

To: Yakima GWMA Data Committee
From: Stephen Swope, Pony Ellingson (PGG)
Re: Draft Ambient Groundwater Monitoring Network Location Selection Method
Date: March 18, 2016

The GWAC has requested the design of a purpose-built groundwater monitoring system for establishing a baseline of water quality conditions within the Groundwater Management Area. The design considerations stipulated by the GWAC for the proposed monitoring network were:

- Establish reasonable well density.
- Consider the availability of alternative sampling locations.
- Consider the general pattern of land use but avoid locations likely to be anomalous as a result of local man-made or natural conditions.
- Include a scale of prioritization indicating which of the specific wells should be given the highest priority for early installation.

To be responsive to these criteria, a well selection methodology was developed that randomly distributed and ranked monitoring points, while avoiding potentially anomalous areas. The method distributes 1000 random points throughout the GWMA, then selects points by repeatedly selecting locations that were furthest from the combination of previously selected locations and the GWMA boundary. The priority of the each location is assigned to the order that it was selected (eg: the first location selected is the highest priority). Once monitoring locations are selected, they are moved to the closest public right of way, which is usually a road right of way. At this point, the preliminary drilling sites are also screened for features that could create anomalous groundwater concentrations. Final drilling sites will be selected after a field review as part of a subsequent scope of work. This memo presents details of the draft methodology for selecting sampling locations for review by the Data Committee.

Random Monitoring Point Pool

ArcMap is first used to randomly distribute 1000 points across the GWMA, excluding the EPA monitored dairy-cluster area. These interior points created a pool from which the monitoring network locations are selected.

Point Selection and Ranking

The point within the pool furthest from the GWMA boundary is selected as the first monitoring location. Next, the point furthest from the combination of the boundary and location number 1 is then identified. This process is repeated to add each subsequent monitoring location to the monitoring network.

The resulting ranked set of points consists of the following:

- The first monitoring point selected is the furthest from the GWMA boundary; this point approximates the centroid of the GWMA.
- The second monitoring point is the random point that is farthest from the combination of the boundary and the first monitoring location. This is the middle of the largest un-sampled area.
- Each subsequent monitoring point selected is the one in the center of the largest un-sampled area. This evenly distributes monitoring locations throughout the GWMA and ranks them by the size of the un-sampled area.

Figure 1 presents the location of the first 30 well locations as selected and prioritized by the method presented above. Once the ranked set of prioritized locations are selected, preliminary drill sites can be selected based on nearby public land locations, local land use, and availability of alternative monitoring sites.

Preliminary Drill Site Selection

Three factors are considered in selecting preliminary drilling sites based on the prioritized points:

- The proposed monitoring network should be installed on public lands or public right of ways to simplify installation and long-term sampling.
- Land uses that might cause local groundwater anomalies should be avoided.
- Existing sampling stations should be considered in lieu of drilling new wells.

Therefore public lands, selected land uses, and known existing water table sampling stations will be mapped to help select actual drilling locations. The following bullets describe the use of each coverage type.

- Proposed drilling sites will be moved to the nearest public land, subject to the additional criteria below. Final selection of drilling sites will be performed after field inspection.
- Irrigation canals often leak and may influence groundwater quality in their vicinity. Monitoring sites will not be located within one-quarter mile downgradient from irrigation canals.
- Monitoring sites will not be located within one-quarter mile downgradient from facilities that may result in anomalous groundwater concentrations.
- Groundwater flow directions, canals, and drains will be mapped to assist in identifying groundwater gradients.

- Existing publically-owned water table monitoring wells will be included to assess use of pre-existing wells. The accuracy of the monitoring well map coverage is likely imperfect. Use of existing wells is subject to field verification and agreement with the (public) well owner.
- Existing agricultural drains will be mapped as potential alternative sampling stations but the map coverage is likely incomplete. Our tentative recommendation is that drains be considered as a separate sampling station network. Therefore proposed drilling locations will not be altered by the presence or absence of agricultural drains.

Groundwater Monitoring Network Report

Once the data committee has approved the well selection method, PGG will provide a report that will include additional details of the network including:

- Recommended preliminary well sites located on public lands. The final drilling sites may be adjusted after a field visit has been completed to each site as part of a separate scope of work.
- Comparison of well sites to general land uses.
- Estimated depth of proposed wells
- A discussion of the optimal number of wells.
- Costs for different sized networks. This will be derived using the estimated depth of the proposed wells and an estimated drilling cost per foot.
- Network installation process and schedule.
- Recommendations on how drains be utilized to augment the groundwater monitoring network.

Attachment C

High Risk Well Assessment Phase II

2016 Outreach Materials

- Direct Mail Invitation to Households (English/Spanish), January 2016
- Well Testing Reminder News Release, January 25, 2016
- Free Private Well Testing Offer Extended News Release, March 1, 2016
- Household Sampling Results Letter (English/Spanish), February 2016

Enclosures

- Updated Certified Laboratories List
 - DOH Coliform Questions and Answers Publication 331-179
 - DOH Nitrate in Drinking Water Publication 331-214
 - DOH Understanding and Caring for Your Septic System Publication 337-086
 - DOH Private Wells Publication 331-171
 - *DOH Emergency Water Supply Guidelines Publication 331-182 (**only sent to those households where E. coli was detected in the coliform sampling*)
- Preliminary Well Assessment Survey Test Results, February 2016

January 2016

Dear Resident:

The Lower Yakima Valley Groundwater Advisory Committee (GWAC) in partnership with the Yakima Health District is offering *free* nitrate and coliform samples for private and shared wells. This is part of an ongoing effort to help residents in the Lower Yakima Valley learn more about the water quality and impact to public health of the area's drinking water.

We are writing to encourage you to participate in our sampling program that should take about 30 minutes. This will be a quick look at conditions surrounding your well that may impact water quality and the health of your family. The samples will show if the water quality may also be a concern to your family's health. The short survey and samples will be completed by an environmental health specialist from the Yakima Health District.

The sampling will be paid for by state funds made available to Yakima County to address areas where there may be high levels of nitrate in drinking water. The survey will help us understand the conditions that exist around the wells and how to best help the residents. It is not our intention to collect personal data for any other use or purpose.

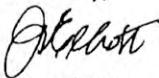
All information collected will be made available to you and will help you make informed decisions about your drinking water and your family's health.

To set up an appointment to participate, please call the Yakima Health District Help Desk at 509-249-6508.

The Lower Yakima Valley GWAC is a multiagency and citizen-based group coordinating efforts to reduce nitrate contamination in drinking water in the Lower Yakima Valley. To learn more about the GWAC and this program, please visit: <http://www.yakimacounty.us/gwma/>.

We look forward to working with you.

Sincerely,



J. Rand Elliott, Yakima County Commissioner

Chairman

The Lower Yakima Valley Groundwater Management Area Advisory Committee

Limited Time Offer

Call Now

509-249-6508

January 2016

El Comité Asesor del Área de Manejo de Agua Subterránea del Valle Bajo de Yakima (GWAC) en asociación con el Distrito de Salud de Yakima está ofreciendo muestras *gratis* de nitrato y bacterias coliformes para los pozos privados y compartidos. Como parte de un esfuerzo continuo para ayudar a los residentes en el Valle Bajo de Yakima a informarse más sobre la calidad y el impacto que tiene el agua para beber del área en la salud pública.

Le escribimos para animarle a que participe en nuestro programa de muestreo que sólo debe durar aproximadamente 30 minutos. La encuesta es un vistazo rápido a las condiciones que rodean su pozo y que pueden afectar la calidad del agua y la salud de su familia. Las muestras mostrarán si la calidad del agua pudiera ser también una preocupación para la salud de su familia. La encuesta corta y las muestras serán tomadas por un especialista en salud ambiental del Distrito de Salud de Yakima.

Las muestras serán pagadas con fondos estatales disponibles para atender áreas del Condado de Yakima donde pudiera haber niveles altos de nitratos en agua para beber. La encuesta nos ayudará a entender las condiciones que existen alrededor de los pozos y la manera de apoyar mejor a los residentes. No es nuestra intención recolectar datos personales para ningún otro uso o propósito.

Toda la información recolectada estará disponible para usted y le ayudará a tomar decisiones informadas acerca de su agua para beber y la salud de su familia.

Para hacer una cita para participar, por favor llame a la línea de ayuda del Distrito de Salud de Yakima al 509-249-6508. El programa de muestreo iniciará este mes. El comité GWAC del Valle Bajo de Yakima es un grupo formado por varias agencias y ciudadanos que coordinan los esfuerzos para reducir la contaminación por nitrato en el agua para beber en el Valle bajo de Yakima. Para más información acerca de GWAC y de este programa, visite: <http://www.yakimacounty.us/gwma/>.

Esperamos poder trabajar con usted.

Atentamente,



J. Rand Elliott, Presidente de Comisionados del Condado de Yakima

Comité Asesor del Área de Manejo de Agua Subterránea del Valle Bajo de Yakima

Oferta Por Tiempo Limitado

Llama Ahora

509-249-6508



Groundwater Management Area (GWMA):

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

February Deadline Approaching For Free Private Well Testing

**Sponsored by Lower Valley Groundwater February Deadline Citizens
Group**

FOR IMMEDIATE RELEASE: MONDAY, JANUARY 25, 2016

CONTACT: Lisa Freund, Yakima County Public Services Administrative Manager
Office: 509-574-2300

Yakima – Lower Yakima Valley residents who are served by a private or shared well still have time to receive free nitrate and coliform sampling, but the deadline to participate is approaching. The sampling and well survey, offered by the Yakima Health District in partnership with the Lower Yakima Valley Groundwater Advisory Committee (GWAC), is available for one more month—through February 2016.

To qualify, households must be served by a private or shared well within the Lower Yakima Valley Groundwater Management Area (*GWMA) boundaries and be willing to take part in a well assessment survey. An environmental health specialist from the Yakima Health District will complete both the well assessment survey and take the samples from the wells. The visit will take about 30 minutes at most, and all of the information, including well water test results, will be made available to the households.

The information collected will help the GWAC understand the conditions that exist around the wells and how to best help the residents. The survey is not intended to collect personal data for any other purpose.

To participate in this limited time offer, please call the Yakima Health District Help Desk at 509-249-6508 to schedule an appointment. Any concerns about water quality, sample results or the site survey will be explained to the participants, with sample results expected later this year.

To learn more about the GWAC and to see the GWMA boundaries, please visit:
<http://www.yakimacounty.us/gwma/>.

**The GWMA does not extend to the Yakama Nation. Those residents are encouraged to call Sean Blackshear at Indian Health Services – Environmental Health 509-865-1776.*

###

Free Private Well Testing Offer Extended

Sponsored by Lower Valley Groundwater Citizens Group

FOR IMMEDIATE RELEASE: TUESDAY, MARCH 1, 2016

CONTACT: Lisa Freund, Yakima County Public Services Administrative Manager
Office: 509-574-2300

Yakima — Residents of the Lower Yakima Valley who are served by a private or shared well have until the end of this month to receive free nitrate and coliform sampling. The sampling and well survey, offered by the Yakima Health District in partnership with the Lower Yakima Valley Groundwater Advisory Committee (GWAC), has been extended to March 31 due to high demand.

To qualify, households must be served by a private or shared well within the Lower Yakima Valley Groundwater Management Area (*GWMA) boundaries and be willing to take part in a well assessment survey. An environmental health specialist from the Yakima Health District will complete both the well assessment survey and take the samples from the wells. The visit will take about 30 minutes at most, and all of the information, including well water test results, will be made available to the households.

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###



Groundwater Management Area (GWMA):

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

February 2016

«Parcel_Number»
«Resident»
«St_Address_Phy»
«City», «State», «Zip_Phy»

Dear Resident:

Thank you for participating in the recent Lower Yakima Valley Groundwater Management Area (LYV GWMA) High Risk Well Assessment Survey. A certified lab analyzed the water quality samples taken from your home or well during the survey. These samples included an inorganic sample for Nitrate and a bacteriological sample for Coliform.

We enclosed a copy of the lab results for your drinking water.

- * The Nitrate level detected was «NitrateNitrite» mg/L. These results are normal and well within the acceptable range for nitrate.

We recommend you continue sampling for nitrate each year, even though your nitrate levels are within an acceptable range (less than 10 mg/L).

- * The coliform results were UNSATISFACTORY.

Your coliform sample was Unsatisfactory. An Unsatisfactory result means Total Coliform was found in your sample. In addition, further testing found E. coli (Fecal) present. The presence of this bacteria indicate there is a breach in your well or pipes where dirt is getting into your pipes. We recommend reviewing the enclosed fact sheet for emergency disinfection procedures and having another coliform sample taken to the lab for analysis.

We also enclosed fact sheets on Nitrate, Coliform, and websites (links) that you may find helpful. These websites have more information about many drinking water contaminants, Maximum Contaminant Levels, treatment options, as well as proper maintenance for your well. For example:

- * You may enter your results into the Ohio Watershed Interpretation Tool at <http://ohiowatersheds.osu.edu/know-your-well-water/well-water-interpretation-tool> for a detailed explanation of your results for any drinking water contaminant sampled and possible treatment recommendations, or
- * Go to Well Owner.org <http://www.wellowner.org/water-quality/water-testing/>, for information on private wells, recommended testing, treatment, maintenance, and so on.

Why was my well water tested for Nitrate and Coliform?

The Lower Valley Groundwater Advisory Committee (GWAC) is a multi agency and citizen-based group coordinating efforts to reduce nitrate contamination in drinking water in the Lower Yakima Valley. To learn more about the GWAC, please visit: <http://www.yakimacounty.us/gwma/>. Our interest in the study was to inform residents and homeowners served by private or shared wells in the Lower Yakima Valley of the potential health risks associated with their drinking water. We were also interested in gathering more information about the Nitrate level in your drinking water.

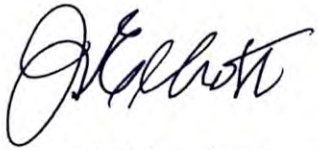
Can I be of more help?

Yes, and again we are very grateful for the assistance you have already given us. There is more funding available for doing more tests and surveys on homes served by private wells. Our interest is to get the word out to more residents of the Lower Yakima Valley. Please give us a call at (509) 574-2300 or email us at PSWebContacts@co.yakima.wa.us if

Can I be of more help?

Yes, and again we are very grateful for the assistance you have already given us. There is more funding available for doing more tests and surveys on homes served by private wells. Our interest is to get the word out to more residents of the Lower Yakima Valley. Please give us a call at (509) 574-2300 or email us at PSWebContacts@co.yakima.wa.us if you know a neighbor or friend in the area who is interested in having their well tested and the survey completed. As part of our effort to evaluate the levels of nitrate in the LYV, we may be looking for permanent ongoing monitoring sites. Please call at (509) 574-2300 if you want us to consider your well for part of this effort.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Rand Elliott". The signature is fluid and cursive, with the first name "J. Rand" and last name "Elliott" clearly distinguishable.

J. Rand Elliott, Chairman
Lower Yakima Valley Groundwater Advisory Committee (GWAC)

Enclosures

Febrero, 2016

«Parcel_Number»
«Resident»
«St_Address_Phy»
«City», «State» «Zip_Phy»

Estimado residente:

Gracias por su participación en la Encuesta de Evaluación de Pozos de Alto Riesgo del Área de Manejo de Agua Subterránea del Valle Bajo de Yakima (LYV GWMA). Un laboratorio certificado analizó la calidad de las muestras de agua que se tomaron de su casa o pozo durante la encuesta. Las muestras se sometieron a una muestra inorgánica para Nitrato y una muestra bacteriológica para Coliforme.

Adjuntamos en esta carta una copia de los resultados de laboratorio de su agua para beber.

- * El nivel de Nitrato detectado fue de «NitrateNitrite» mg/L. Este resultado es normal y el pozo está dentro de los niveles aceptables por nitrato.

Aunque los niveles de Nitrato estén dentro de un rango aceptable (menos de 10.0 mg/L), le recomendamos que continúe haciendo pruebas por Nitrato a su pozo cada año.

- * Los resultados para bacteria coliforme fueron INSATISFACTORIOS.

Los resultados para bacteria coliforme fueron INSATISFACTORIOS. Un resultado Insatisfactorio significa que en su muestra se encontró bacteria Coliforme Total. Además al evaluarse la muestra más a fondo se encontró E. Coli (Fecal) presente. La presencia de esta bacteria indica que en su pozo o tuberías existe alguna ruptura que permite que entre tierra al sistema. Le recomendamos que revise la hoja de factores adjunta para que realice los procedimientos de desinfección de emergencia y que tome otra muestra para que la analicen en el laboratorio.

También adjuntamos hojas con factores acerca del Nitrato, Coliforme y sitios en el internet (enlaces) que pudieran ser útiles. Estos sitios en el internet tienen más información acerca de muchos contaminantes en el agua para beber, Niveles máximos de Contaminación, opciones de tratamiento y también del mantenimiento apropiado de su pozo. Por ejemplo:

- * Para obtener una explicación detallada de sus resultados para cualquier contaminante al que se le haya echo la prueba a su agua para beber y recomendaciones para un tratamiento posible, usted puede ingresar sus resultados en la Ohio Watershed Interpretation Tool en: <http://ohiowatersheds.osu.edu/know-your-well-water/well-water-interpretation-tool>, o
- * Para información sobre pozos privados, pruebas que se recomiendan, tratamientos y mantenimiento vaya a Well Owner.org <http://www.wellowner.org/water-quality/water-testing/>.

¿Por qué se hicieron pruebas por Nitrato y Coliforme al agua de mi pozo?

El grupo GWAC del Valle Bajo de Yakima es un grupo formado de varias agencias y ciudadanos que está coordinando esfuerzos para reducir la contaminación por nitrato en el agua para beber en el Valle Bajo de Yakima. Para más información acerca de GWAC, por favor visite: <http://www.yakimacounty.us/gwma/>. Nuestro interés en el estudio fue informar a los residentes y propietarios de casas que usan el agua de pozos privados o compartidos en el Valle Bajo de Yakima de los riesgos potenciales de salud asociados con su agua para beber. También estamos interesados en reunir más información sobre el nivel de Nitrato en su agua para beber.

Puedo ayudar en algo?

Si, y una vez más, estamos muy agradecidos por la asistencia que ya nos ha brindado. Existen más fondos disponibles para hacer más pruebas y encuestas en casas que usan pozos privados. Nuestro interés es pasar la palabra a más residentes del Valle Bajo de Yakima. Por favor, si conoce a un vecino o amigo en el área que esté interesado en que se le hagan pruebas a su pozo y en hacer la encuesta, llámenos al (509) 574-2300 ó envíe un email a:

PSWebContacts@co.yakima.wa.us. Como parte de nuestro esfuerzo para evaluar los niveles de nitrato en el Valle Bajo de Yakima, quizás busquemos lugares permanentes para monitoreo continuo. Por favor, si desea que consideremos su pozo para parte de este esfuerzo llámenos al (509) 574-2300.

Atentamente,

A handwritten signature in black ink, appearing to read "J. Rand Elliott". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

J. Rand Elliott, Presidente

Comité Asesor de Aguas Subterráneas del Valle Bajo de Yakima (GWAC)

Adjuntos

Lower Yakima Valley GWMA Program Certified Testing Laboratories

(Updated April 29, 2015)

Laboratory Name	Address	Phone	Web Site	Approximate Cost
Ag Health Laboratories, Inc.	445 Barnard Boulevard Sunnyside, WA	(509) 836-2020	www.aghealthlabs.com	Nitrate - \$36 Coliform - \$24
Benton-Franklin Health District Lab	7102 West Okanogan Place Kennewick, WA	(509) 460-4206	www.bfhd.wa.gov	Nitrate - \$25 Coliform - \$24
Cascade Analytical Inc. - Yakima	1008 West Ahtanum Road, #2 Yakima, WA	(509) 452-7707	www.cascadeanalytical.com	Nitrate - \$46 Coliform - \$25
Mukang Labs, Inc.	2526 E. Saint Helens Street Pasco, WA	(509) 544-2159	www.mukanglabs.com	Nitrate - \$19 Coliform - \$20
Northwest Agricultural Consultants, Inc.	2545 West Falls Ave. Kennewick, WA	(509) 783-7450	www.nwag.com	Nitrate - \$17.50 Coliform - NA
Valley Environmental Laboratory	15 W. Yakima Ave, Suite 210 Yakima, WA 98901	(509) 575-3999	http://www.valleylab.net/	Nitrate - \$40 Coliform - \$25

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.

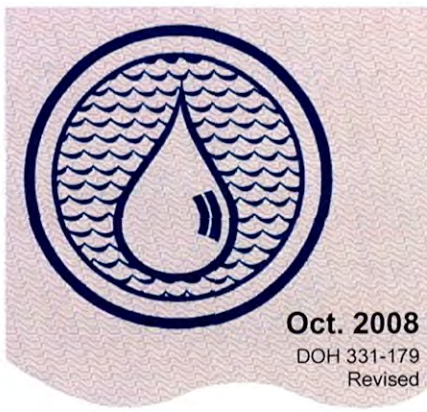
Lower Yakima Valley GWMA Program

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 - \$36 Coliforme - \$24
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Valley Environmental Laboratory	15 W. Yakima Ave, Suite 210 Yakima, WA 98901	(509) 575-3999	http://www.valleylab.net/	Nitratos - \$40 Coliforme - \$25

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.



Questions & Answers

Public Health Advisory Coliform

Why must I boil my water?

Recent testing shows that your water system is contaminated with organisms that could cause illness.

Who can be affected? Can I become ill?

Anyone who drinks contaminated water may become ill. Infants, young children, the elderly, and people with severely compromised immune systems are more at risk of illness.

Who are people with compromised immune systems?

People who are on chemotherapy, organ or bone marrow recipients, those with HIV or AIDS, malnourished children, infants, and some of the elderly have compromised or weakened immune systems. An infection from a disease-causing organism may lead to very serious health problems for these people.

Can these diseases be spread in ways other than drinking the water?

Yes. Many of these disease-causing organisms are shed in the feces of infected people. In fact, some infected people do not have any symptoms but still shed these organisms. Childcare workers, young children who attend childcare, and caregivers for people who are sick and shedding these organisms are at the greatest risk of becoming ill. Washing hands with soap and water after using the toilet and before preparing food prevents the spread of diseases to others.

What are the symptoms to watch for?

What should I do if I think I have a waterborne illness?

Disease-causing organisms in water can cause diarrhea, stomach cramps, bloating, gas, fatigue, weight loss, nausea, vomiting, and/or fever. Symptoms may appear as early as a few hours to several days after infection and may last more than two weeks. If you are ill with these symptoms, contact your health care provider.

How can I make the water safe?

Boiling is the best way to ensure water is free of illness-causing organisms. Bring the water to a rolling boil for one minute. When it cools, refrigerate the water in clean covered containers.

If you don't want to boil your water, you can disinfect the water using household bleach. Do not use bleach that contains perfume, dyes, or other additives. Use 1/8-teaspoon bleach per gallon of water, mix thoroughly, and then let stand for 60 minutes before using.



HELPING TO ENSURE SAFE AND RELIABLE DRINKING WATER

Can I use bottled water?

You can use purchased bottled water. If you choose to use bottled water, Department of Health recommends water that is:

- Reverse-osmosis treated.
- Distilled.
- Filtered through an “absolute” one micron or smaller filter.

Carbonated water in cans or bottles is usually filtered or heated to remove illness-causing organisms.

During a health advisory, can I use tap water for...?

Drinking	No	Coffee or tea	No
Ice cubes	No	Showers/Baths	Yes
Brushing teeth	No	Washing clothes	Yes
Baby’s formula	No	Baby’s bath	See below
Washing vegetables/fruits	No	Washing dishes	See below
Preparing food	No	Pet’s water bowl	Contact veterinarian

Can I bathe my baby or child using tap water?

Yes, as long as they do not drink any of the water. Don’t let babies suck on a washcloth, as they will be ingesting some of the water.

Can I wash dishes?

You can use your dishwasher if you use the sanitizing/heat cycle and commercial dishwashing detergent. You can hand wash dishes, rinse them in a diluted bleach solution—one teaspoon household bleach to one gallon of water—and then let dishes air dry.

What must be done to fix the problem?

Fixing the problem could be different in each situation depending on whether the problem is at the water source or in the water lines. Usually, in every case the water lines will need to be flushed and the whole system will need to be disinfected using chlorine. The water will then be tested to make sure it is free of coliform bacteria.

How long will this health advisory be in effect?

This health advisory will remain in effect until the water is tested and results show that it meets public health drinking water standards. Your water system will notify you when that occurs.

For more information:

Personal medical questions: Contact your health care provider (physician, nurse consultant, etc.)

Call your local health jurisdiction with general questions about infectious disease, communicable disease transmission, symptoms, causes and prevention of waterborne disease.





Preguntas y Respuestas

Advertencia de Salud Pública Coliforme

¿Por qué debo hervir el agua?

Recientemente, se han hecho análisis del sistema de agua potable que demuestran que el agua está contaminada con organismos que pueden causar enfermedades.

¿A quién le afecta? ¿Puedo enfermarme?

Cualquier persona que beba agua contaminada puede enfermarse. Los bebés, niños, ancianos y personas con sistemas inmunológicos comprometidos tienen mayor riesgo de enfermarse.

¿Quiénes son las personas con sistemas inmunológicos comprometidos?

Las personas con sistemas inmunes comprometidos incluyen personas que reciben la quimioterapia, personas que reciben órganos o trasplante de médula ósea, las personas con VIH o SIDA, niños desnutridos, bebés, y algunos ancianos. Si una de estas personas se infecta de un organismo que causa enfermedades, puede resultar en problemas de salud muy graves.

¿Pueden estas enfermedades propagarse por otros medios además del agua potable?

Sí. Muchos organismos que causan enfermedades se eliminan en las heces de personas infectadas. Algunas personas infectadas no tienen síntomas, pero pueden eliminar estos organismos en las heces. Los niños pequeños que van al Kinder y los trabajadores que los cuidan, o las personas que cuidan de personas enfermas que eliminan estos organismos, corren el riesgo de enfermarse. Lavarse las manos con jabón y agua después de ir al baño y antes de preparar la comida previene la propagación de enfermedades a los demás.

¿Cuáles son los síntomas? ¿Qué debo hacer si pienso que tengo una enfermedad transmitida por el agua?

Las enfermedades que los organismos en el agua pueden causar son diarrea, calambres estomacales, inflamación, gas, mucho cansancio, pérdida de peso, náusea, vómito, o fiebre. Los síntomas pueden aparecer a las pocas horas o después de varios días de infectarse. Pueden durar más de dos semanas. Si está enfermo con estos síntomas, contacte a un profesional de la salud.

¿Qué puedo hacer para que el agua este limpia?

Hervir el agua es la mejor forma para asegurarse que esté libre de organismos que causan enfermedades. Ponga el agua en la estufa hasta que hierva y deje hervir el agua por un minuto. Cuando se enfríe, guárdela en un recipiente limpio y cubierto en el refrigerador. Si no quiere hervir el agua, Usted puede desinfectar el agua con cloro de uso casero. No use cloro que contenga perfume, colorantes, u otros aditivos. Use 1/8 cucharadita de cloro por galón de agua; mezcle bien y deje reposar una hora antes de usar.



HELPING TO ENSURE SAFE AND RELIABLE DRINKING WATER

¿Puedo usar agua embotellada?

Usted puede comprar agua embotellada. Si Usted escoge agua embotellada, el Departamento de Salud recomienda que el agua sea:

- Tratada por osmosis inversa
- Destilada
- Filtrada con un filtro de un micrón “absoluto” o menor

El agua carbonatada de lata o botella ha sido filtrada o calentada para quitar organismos que causan enfermedades.

Bajo una advertencia de salud pública, ¿puedo usar el agua de la llave para...?

Beber	No
Cubos de hielo	No
Cepillar los dientes	No
Preparar el biberón	No
Lavar verduras/frutas	No
Preparar comida	No
Café o té	No
Duchas/baños	Sí
Lavar la ropa	Sí
El baño del bebé	Vea abajo
Lavar los platos	Vea abajo
El tazón de agua de las mascotas	Contacte al veterinario

¿Puedo bañar a mi bebé o niño con el agua de grifo?

Sí, mientras no beban nada del agua. No deje que los bebés chupen la toallita porque beberían algo del agua.

¿Puedo lavar los platos?

Usted puede usar el lavaplatos si utiliza el ciclo de esterilizador/calentador y detergente para lavaplatos comercial. Usted puede lavar los platos a mano, y enjuagar con una solución de agua y lejía- una cucharadita de lejía de uso casero por cada galón de agua. Después deje que se sequen al aire.

¿Qué hace falta para solucionar el problema?

La solución del problema es diferente en cada situación, dependiendo si el problema está en las tuberías o en la fuente principal del agua. Normalmente, en cada situación, hay que limpiar las tuberías y desinfectar el sistema entero con cloro. Entonces se analiza el agua para asegurar que esté libre de bacteria coliform.

¿Hasta cuando durará esta advertencia de salud?

Esta advertencia de salud estará en efecto hasta que el agua sea analizada y los resultados cumplan con las normas de salud para el agua potable. Cuando esto ocurra, se notificará al público.

Para mayor información:

Preguntas médicas personales: Contacte a un profesional de salud (médico, enfermero, etc.)

Llame a la oficina de salud local en su área con preguntas generales acerca de las enfermedades infecciosas, transmisión de enfermedades, los síntomas, las causas y la prevención de enfermedades transmitidas por el agua.



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.

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.

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.

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.



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. Some studies have found an increased 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/CommunityandEnvironment/DrinkingWater.aspx>

If you have a private well, call your local health department. You can also find information in *Private Wells: Information for owners* (331-349) 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.



If you need this publication in an alternate format, call 800-525-0127. For TTY/TDD, call 800-833-6388.



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.

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.

¿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.

¿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. Para bebés con 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.



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 contruidos 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/CommunityandEnvironment/DrinkingWater.aspx>

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/eap/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/TDD, llame al 800-833-6388.

Caring For Your System - The Ten Essentials

1. **Practice water conservation.** The more wastewater you produce, the more wastewater the soil must treat and dispose. By reducing and balancing your use, you can extend the life of the drainfield, decrease the possibility of system failure, and avoid costly repairs.

To reduce your water use:

- Use water-saving devices.
- Repair leaky faucets and plumbing fixtures.
- Reduce toilet reservoir volume or flow.
- Take shorter showers.
- Take baths with a partially-filled tub.
- Wash only full loads of dishes and laundry.

2. **Keep accurate records.** Know where your septic tank system is and keep a diagram of its location. Records of its size and location may be available at your local health agency. It is also wise to keep a record of maintenance on the system. These records will be helpful if problems occur, and will be valuable to the next owner of your home.
3. **Inspect your system once a year.** Check the sludge and scum levels inside your septic tank to assure that the layers of solids are not within the "early warning levels". Also check the tank to see if the baffles or tees are in good condition. Periodically inspect the drainfield and downslope areas for odors, wet spots, or surfacing sewage. If your drainfield has inspection pipes, check them to see if there is liquid level continually over 6 inches. This may be an early indication of a problem.
4. **Pump out your septic tank when needed.** Don't wait until you have a problem. Routine pumping can prevent failures such as clogging of the drainfield and sewage back-up into the home. Using a garbage disposal will increase the amount of solids entering the septic tank, requiring more frequent pumping.

5. **Never flush harmful materials into the septic tank.** Grease, cooking oils, newspaper, paper towels, rags, coffee grounds, sanitary napkins, and cigarettes cannot easily decompose in the tank. Chemicals such as solvents, oils, paint and pesticides are harmful to the system's proper operation and may pollute the groundwater. Septic tank additives are not necessary for the proper functioning of a septic tank, nor do they reduce the need for routine pumping. For information on the proper disposal of hazardous household waste, call the Recycle Hotline, 1-800-RECYCLE.
6. **Keep all runoff away from your system.** Water from surfaces such as roofs, driveways, or patios should be diverted away from the septic tank and drainfield area. Soil over your system should be slightly mounded to help surface water runoff.
7. **Protect your system from damage.** Keep traffic such as vehicles, heavy equipment, or livestock off your drainfield or replacement area. The pressure can compact the soil or damage pipes. Before you plant a garden, construct a building, or install a pool, check on the location of your system and replacement area.
8. **Landscape your system properly.** Don't place impermeable materials over your drainfield or replacement area. Materials, such as concrete or plastic, reduce evaporation and the supply of air to the soil for proper effluent treatment. They can also hinder getting to the system for pumping, inspection, or repair. Grass is the best cover for your system.
9. **Never enter any septic tank.** Poisonous gases or the lack of air can be fatal. Any work to the tank should be done from the outside.
10. **Check with your local health agency for help with system problems.** Although some malfunctions may require complete drainfield replacement, many problems can be corrected with a minimum amount of cost and effort.

Additional information is available from the following Department of Health publications:

Water Conservation Guidelines to Being Waterwise DOH 331-120
www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/DrinkingWaterEmergencies/DroughtInformation.aspx

For more information on conventional gravity systems and other types of onsite sewage systems, please visit our web site at www.doh.wa.gov/CommunityandEnvironment/WastewaterManagement/FormsPublications.aspx

On-Site Sewage System Regulations
 Chapter 246-272A WAC
apps.leg.wa.gov/WAC/default.aspx?cite=246-272A

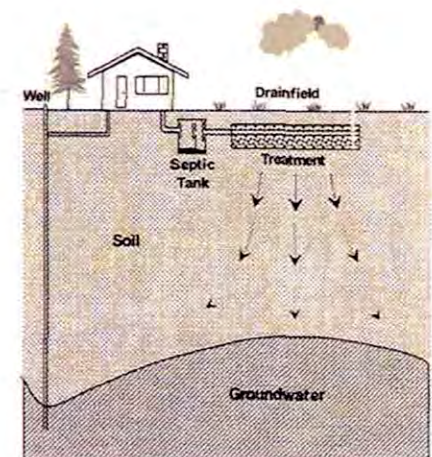
The above publications are available from your county health agency or by writing to:

Washington State Department of Health
 Wastewater Management Section
 PO Box 47824
 Olympia, WA 98504-7824

Other sources of information include your:

Local Health Agency
 Soil Conservation Service Office
 Cooperative Extension Office

Understanding And Caring For Your Septic Tank System



WASHINGTON STATE
 DEPARTMENT OF HEALTH

WASHINGTON STATE UNIVERSITY
 COOPERATIVE EXTENSION SERVICE



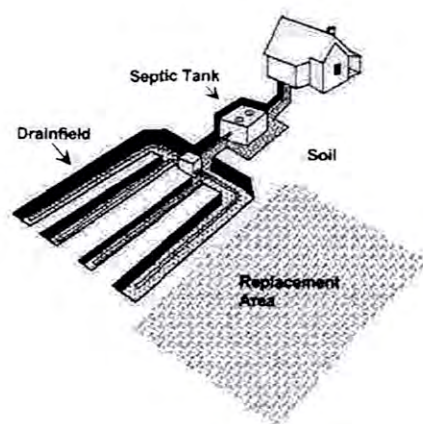
DOH 337-086 September 2012

Households that are not served by public sewers usually depend on septic tank systems to treat and dispose of wastewater. A well designed, installed, and maintained septic system can provide years of reliable low-cost service. When these systems fail to operate effectively, property damage, groundwater and surface water pollution, and disease outbreaks can occur. Therefore, it makes good sense to understand and care for your septic tank system.

There are many different types of septic tank systems to fit a wide range of soil and site conditions. The following information will help you to understand a conventional gravity-flow septic tank system, and keep it operating safely at the lowest possible cost.

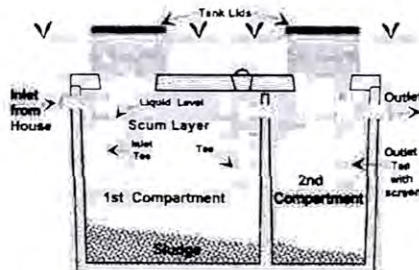
A conventional gravity-flow septic tank system has three working parts:

1. The septic tank.
2. The drainfield with its replacement area.
3. The surrounding soil.



The Septic Tank

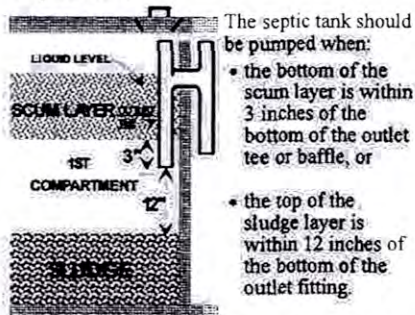
The typical septic tank is a large buried rectangular or cylindrical container made of concrete, fiberglass, or polyethylene. Wastewater from your toilet, bath, kitchen, laundry, etc. flows into the tank. Heavy solids settle to the bottom where bacterial action partially decomposes them to digested sludge and gases. Most of the lighter solids, such as fats and grease, rise to the top to form a scum layer.



Septic tanks may have one or two compartments. Two compartment tanks do a better job of settling solids and are required for new systems. Tees or baffles are provided at the tank's inlet and outlet pipes. The inlet tee slows the incoming wastes and reduces the disturbance of the settled sludge. The outlet tee keeps the solids or scum in the tank. All tanks should have accessible covers for checking the condition of the baffles and for pumping both compartments. If risers extend from the tank to or above the ground surface, they should be secure to prevent accidental entry into the tank.

Soils that are not decomposed remain in the septic tank. If not removed by periodic pumping, solids will accumulate until they eventually overflow into the drainfield. Most septic tanks need to be pumped every 3 to 5 years, depending on the tank size and the amount and type of solids entering the tank.

"Early Warning" Levels Inside Your Septic Tank



Some septic tank additives on the market with chemicals, yeast, bacteria, or enzymes claim to improve septic tank performance or reduce the need for routine pumping. Such products are not necessary for the proper functioning of a septic tank. Some can cause solids to carry over to the drainfield, which results in early soil clogging and the need for a new drainfield. Products containing organic solvents contribute to groundwater pollution.

The wastewater leaving the septic tank is a liquid called effluent. It has been partially treated but still contains disease-causing bacteria and other pollutants. Discharging effluent onto the ground's surface or into surface and ground water is against Washington State law.

The Drainfield

The drainfield receives septic tank effluent. It has a network of perforated pipes laid in gravel filled trenches (2-3 feet wide) or beds (up to 10 feet wide) in the soil. Wastewater trickles out of the pipes, through the gravel layer, and into the soil. The size and type of drainfield depends on the estimated daily wastewater flow and soil conditions.

Every new drainfield is required to have a designated replacement area. It must be maintained should the existing system need an addition or repair.

The Soil

The soil below the drainfield provides the final treatment and disposal of the septic tank effluent. After the effluent has passed into the soil, most of it percolates downward and outward, eventually entering the groundwater. A small percentage is taken up by plants through their roots, or evaporates from the soil.

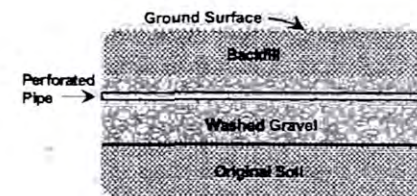
The soil filters effluent as it passes through the pore spaces. Chemical and biological processes treat the effluent before it reaches groundwater, or a restrictive layer, such as hardpan, bedrock, or clay soils. These processes work best where the soil is somewhat dry, permeable, and contains plenty of oxygen for several feet below the drainfield.

System Failure

Warning signs of a failure:

- Odors, surfacing sewage, wet spots or lush vegetation growth in the drainfield area
- Plumbing or septic tank backups
- Slow draining fixtures
- Gurgling sounds in the plumbing system

If you notice any of these signs or if you suspect your septic tank system may be having problems, contact your local health agency for assistance.





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.

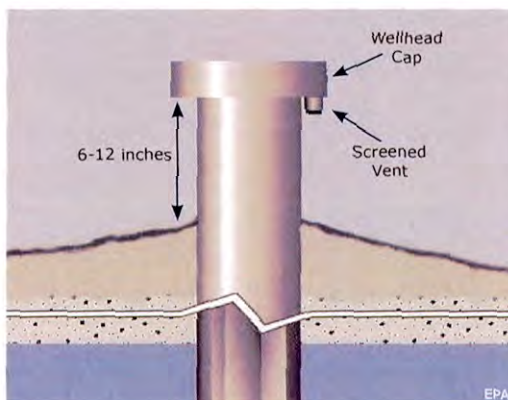
How can I protect my well water from contamination?

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.

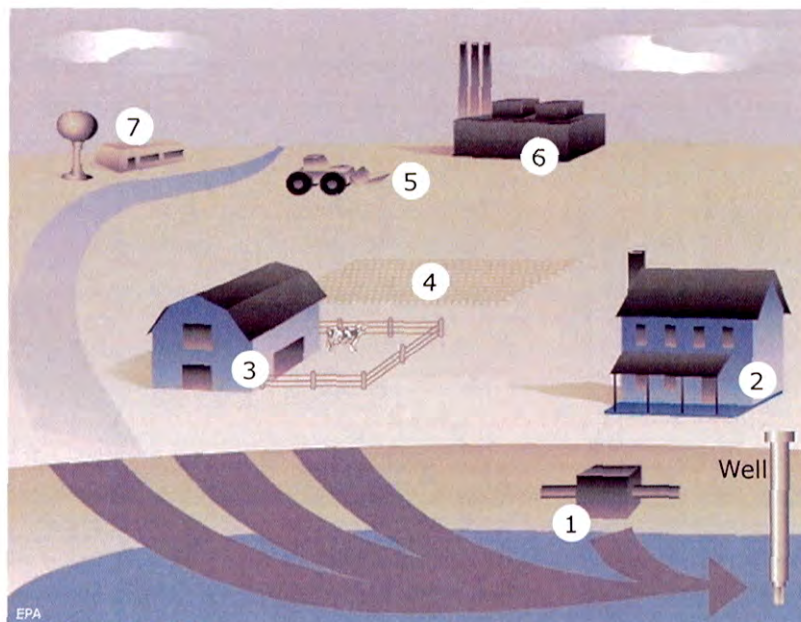
Experts suggest your well should be at least:

- 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>



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 oscuro 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 pueden 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.

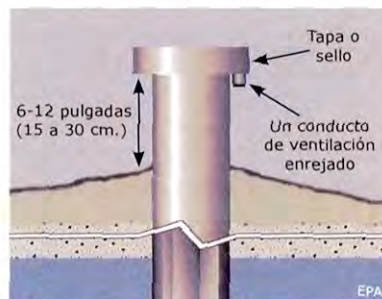
¿Cómo puedo proteger el agua de mi pozo de la contaminación?

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.

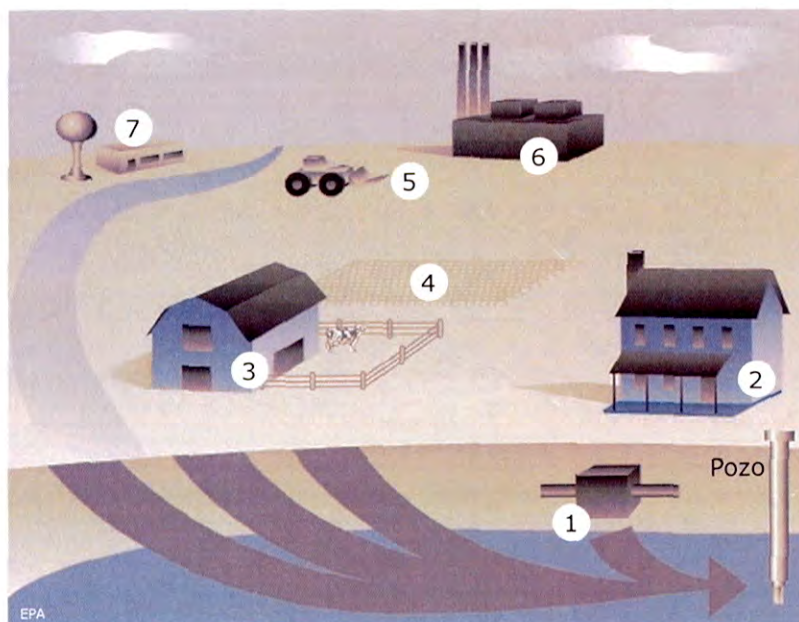
Los expertos sugieren que el pozo debe estar al menos:

- 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>



Hoja Informativa

Directrices del suministro de agua de emergencia para los servicios de alimentación

**Restaurantes – Tiendas de Comida – Escuelas
Instituciones – Tiendas de Conveniencia**

Estas directrices son para los establecimientos que dan servicio de alimento al público. Las normas del estado (WAC 246-215-05100) requieren que los dueños de los establecimientos de servicios alimentarios (FSE por sus siglas en inglés) se aseguren que su suministro de agua sea de una fuente aprobada por el Departamento de Salud del Estado de Washington (WAC 246-290).

Los procedimientos requeridos durante una advertencia de hervir agua

Cuando un sistema de agua anuncia una advertencia de hervir agua, los establecimientos de servicios alimentarios tienen que cerrar al menos que la agencia de salud local autorice que podrán permanecer abiertos. Si la agencia de salud local autoriza que un FSE puede permanecer abierto, es necesario que el FSE siga los requisitos mínimos (abajo) hasta que se acabe la advertencia de salud. *La agencia local de salud puede imponer requisitos adicionales para proteger contra los riesgos de salud bajo una advertencia de hervir agua, como modificar los métodos de preparar comida y hasta prohibir que ciertos ingredientes o alimentos sean servidos.*

Requisitos Mínimos

Apagar:

- Máquinas de hielo
- Bebederos
- Humedecedores de verduras
- Máquinas de rellenar agua en botella
- Máquinas de refrescos conectadas al suministro de agua
- Tarjas de agua corriente para enjuagar utensilios de cocina
- Cafeteras

Tirar:

- Hielo hecho con agua contaminada
- Bebidas hechas con agua contaminada

Hielo: Use hielo empaquetado de una fuente aprobada

Use agua hervida o en botella para:

- Beber
- Cocinar
- Preparar comida
- Lavar frutas y verduras

Lavado de manos:

- Lave con jabón antibacteriano y agua
- Recomendado: Use limpiador antiséptico después de enjuagar y secar

Opciones para lavar platos:

Siga procedimientos normales

- Use una lavavajillas mecánica de temperatura alta o un desinfectante químico (verifique la operación correcta); ó
- Use un fregadero de tres compartimentos
 1. Lave en agua caliente con detergente
 2. Enjuague en agua tibia
 3. Enjuague en una solución de desinfectante químico con agua fría (1 cucharadita de cloro por galón de agua) o con agua caliente (170°) por un minuto.
 4. Secar al aire

Información para empleados:

- Ponga carteles ó copias de la advertencia de salud del sistema de agua
- Desarrolle un plan para notificar e informar a los empleados sobre los procedimientos de emergencia



HELPING TO ENSURE SAFE AND RELIABLE DRINKING WATER

Una vez que el sistema de agua no esté bajo la advertencia de salud de hervir agua, consulte al manual del usuario para información sobre cómo limpiar los electrodomésticos industriales y otra maquinaria.

Siga estos procedimientos hasta recibir notificación de la agencia local de salud o el Departamento de Salud del estado.

Para personas discapacitadas, este documento está disponible a su pedido en otros formatos. Para hacer su pedido, llame al 1-800-525-0127 (TDD/TTY llame al 711).

Well Assessment Survey Test Results

Through February 15, 2016

Nitrate Test Results

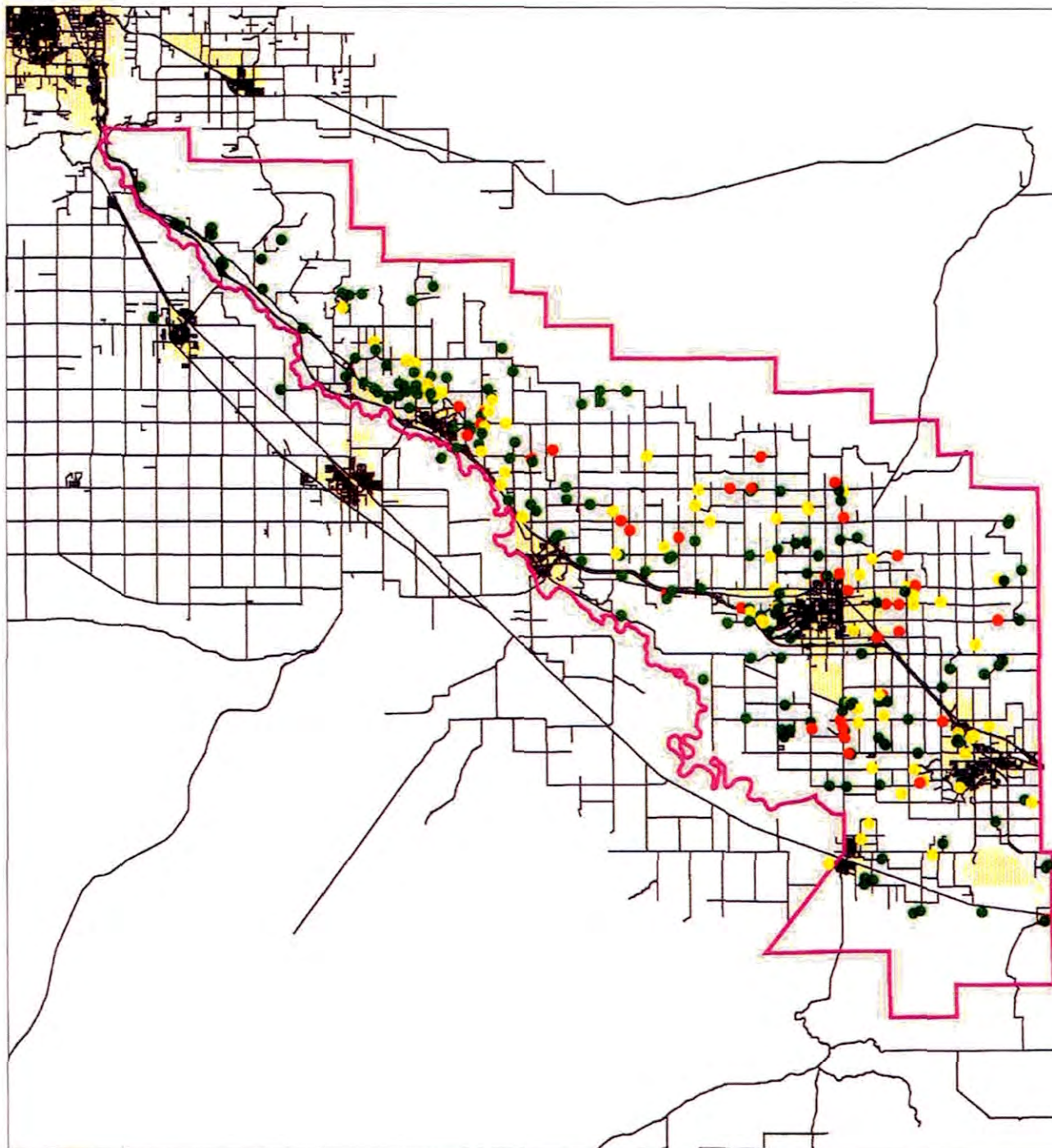
Nitrate Range	Number of Wells	Percent
0 to 5.0	172	60%
5.01 to 9.99	76	26%
10.0 to 35	40	14%
Grand Total	288	100%

Bacteria Test Results

Result	Number of Wells		
	Bacteria Present	Ecoli Present	Fecal Present
Satisfactory	228	286	288
Unsatisfactory	60	2	0
Grand Total	288	288	288

Nitrate and Bacteria Test Results

Nitrate Range	Number of Wells	Bacteria Present	Ecoli Present	Fecal Present
0 to 5.0	172	40	2	0
5.01 to 9.99	76	14	0	0
10.0 to 35	40	6	0	0
Grand Total	288	60	2	0



YAKIMA COUNTY

GEOGRAPHIC INFORMATION SERVICES

Well Assessment Survey Results

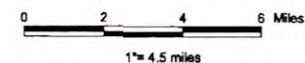
Nitrate Values

Theme6.shp

- 0 - 5
- 5 - 9.99
- 10 - 35

Groundwater Management Area

Parcel Lot lines are for visual display
only. Do not use for legal purposes.



Yakimap.com

Copyright (C) 2016 Yakima County

This map was derived from several databases. The
County cannot accept responsibility for any errors.
Therefore, there are no warranties for this product.

Plot date: Feb 17, 2016; 1

Attachment D

- Amendment No. 1 to the Yakima Health District Agreement dated February 16, 2016.

AMENDMENT # 1
AGREEMENT BETWEEN YAKIMA HEALTH DISTRICT AND YAKIMA COUNTY PUBLIC SERVICES
DEPARTMENT

THIS AMENDMENT No. 1 is entered into this 11th day of February 2016 by and between the County of Yakima, Washington (hereinafter called the "County") whose address is Yakima County Courthouse, 128 N. 2nd St., fourth floor, Yakima, WA 98901 and the Yakima Health District (hereinafter referred to as the "Health District") 1210 Ahtanum Ridge Dr., Yakima, WA 98903.

WHEREAS, the Agreement dated September 8, 2015 retained the Health District to provide up to 200 well assessment sampling surveys; and

WHEREAS, the County requests to extend services by the Health District to provide up to 80 additional sampling surveys at the same rate of \$250 lump sum per completed survey as described in the September 8, 2015 Agreement; and

NOW THEREFORE, It is mutually agreed that the terms, stipulations and conditions of the Agreement, dated September 8, 2015 shall be binding upon the parties hereto, except for the following modifications:


1. Item 2 of the Interlocal Agreement (ILA) is revised as follows: Payment. The Yakima County Department of Public Services, located at 128 N. 2nd St., Yakima, WA 98901 agrees to pay to the Yakima Health District a fee for these services in a lump sum of \$250 per completed site survey, not to exceed a total contract amount of Seventy Thousand Dollars (\$70,000)
2. Item #15 of the ILA is revised as follows: Term. The term of this agreement is for six (6) months, commencing upon entry of this agreement but shall not be in effect beyond March 31, 2016.
3. Attachment A Item #1 is revised as follows: The YAKIMA HEALTH DISTRICT shall provide resources sufficient to conduct up to 280 household sampling surveys using the form "High Risk Well Assessment Survey - Lower Yakima Valley GWMA" Questionnaire (Attachment B).

IN WITNESS THEREOF, the parties hereto have executed this Amendment No. 1 by having their representatives affix their signature below.

DONE this 11th day of February 2016

YAKIMA HEALTH DISTRICT

BOARD OF YAKIMA COUNTY COMMISSIONERS

 For Andre Fresco

Andre Fresco, MSEP
Administrator, Yakima Health District

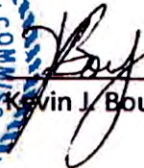


Michael D. Leita, Chairman



Attest: Tiera L. Girard
Clerk of the Board





Kevin J. Bouchey, Commissioner



Approved as to form:
Deputy Prosecuting Attorney



J. Rand Elliott, Commissioner
*Constituting the Board of County Commissioners
for Yakima County, Washington*

BOCC39-2016
February 16, 2016