

## Data Collection, Characterization, Monitoring

### Charge from Groundwater Management Area Advisory Committee

#### Working Group Members

---

Melanie Redding (Chair); Andres Cervantes; Bob Stevens; Charles (Pony) Ellingson; David Bowen; Chelsea Durfey; Dave Cowan; Donald Brown; Doug Simpson; Elizabeth Sanchez; Eric Winiecki; Frank Lyall; Ginny Stern; Jaclyn Hancock; Jan Whitefoot; Jean Mendoza, Jennifer MacDonald; John Van Wingerden, Kevin Lindsey; Laurie Crowe; Lino Guerra; 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, August 10, 2016, 1:00-3:00 PM  
Call Number: 509-574-2353 pin: 2353#

#### Participants

---

Present: Ginny Stern (Acting Chair)\*, Jean Mendoza, Vern Redifer, Jim Davenport, Gary Bahr\*, Matt Bachmann\*, Pony Ellingson\*, Chris Saunders (Support Staff)

\*via phone

#### Key Discussion Points

---

The meeting began at 1:05pm. Melanie Redding had notified members in advance she would be absent for family business, and that Ginny Stern would be chairing the working group. After the customary introductions established that only seven members were present, Ginny asked whether this was a sufficient number to cast a vote to bring a recommendation to the GWAC. Vern and Jim desired to go ahead with the discussion and poll those members present. Absent members could be contacted for their views later before any formal recommendation might be presented to the GWAC.

#### Other Monitoring Objectives

Ginny stated her desire to get group members on-record as to where the ambient groundwater monitoring program should go next, or where any future investments should be focused. She referred group members to the Pacific Groundwater Group's (PGG's) December 3<sup>rd</sup>, 2013 document, "Potential Groundwater Monitoring Stations: Yakima Groundwater Management Area", which contained six potential objectives a monitoring program could seek to address. Each objective would be summarized and discussed, and at the end, each member would rank their top three choices. Each member had been furnished with a copy of the PGG report as part of the meeting materials. Summaries below are quoted from the report.

1. **Spatial Data Gaps:** “The largest five areas without nitrate data were identified as spatial data gaps. The areas range from 4.7 to 12.9 square miles. Existing wells were identified in those areas for field verification with the goal of identifying a single well in each area to serve as a monitoring station.” [Figure 16 in PGG’s report shows a map of the spatial data gaps.]

Vern observed that in the roughly two-and-a-half years since PGG’s report was issued, Yakima County has acquired approximately 450 new data points covering a broader geographic distribution through their wellhead program. Those locations have been entered in the county’s database and can be plotted on GIS maps.

Matt stated that when trying to build a map of Lower Valley wells without data gaps, location was only one factor, but well depth was another. Data gaps among shallow wells may have been filled by this point, but if deep wells were sparsely monitored, the public would not be getting a complete picture. Vern agreed, stating that these had been residential wells that were tested, which rarely go deep.

Gary asked whether the county had done an inventory on when all the wells had been sampled, and whether they were still being sampled today. Vern stated that the original PGG database went back to the late ‘70s, and had been compiled from various studies, some of which are readily available today, and some of which are not. Samples taken in recent years contain more detailed information. Others are spotty when it comes to matching Department of Ecology (DOE) well data with what is presently known. Ginny stated that DOE has the wells recorded according to the original property owner, not necessarily the current owner, on which the well was located. Vern stated that the only thing the county was certain of when it came to well data were the X and Y coordinates on a map, and the nitrate concentration on the day it was sampled. Everything else was based on the memory or data of the people surveyed. Ginny offered the following summary of the discussion: We have enough data to fill the gaps identified in the PGG report, but we’re not sure how to fit it all in. Vern was comfortable with the summary.

2. **Hot Spots:** “PGG identified 71 ‘hot spots’ with maximum nitrate concentrations in excess of 20 mg/L. Assuming an acceptance of 15 percent (owner acceptance, good physical conditions, etc.) to be verified by field visits, we expect to monitor approximately 15 percent of these hot spots (10 monitoring stations).” [Figure 17 shows a map of the hot spots and spatial data gaps.]

Jim questioned whether the 15 percent figure was realistic. If this component was to be pursued, he saw two parts to its implementation. The first was to see what the inventory was on the full list of 71 identified hot spots. The second was continuing to monitor them. It was the second point that posed the most difficulties, i.e., would the property owners let us, were there any construction issues, has anything changed on the ground since 2013?

Vern stated that of the 450 new wells sampled since 2013, about 15 percent were exceeding nitrate concentrations of 10 mg/L. He was unaware how many were over 20 mg/L. Of those highly-contaminated wells, he was not aware if they were clustered together. Jean pointed out the maps on Figures 16 and 17, and Vern stated that the county could produce a 2013 vs. 2016 comparison map.

Gary asked what Vern meant by 450 “new” wells, and Vern clarified that they were not newly-drilled wells, but existing wells that were sampled on a voluntary basis through an assessment on well features over the last few years since the PGG report.

Matt questioned how much confidence should be placed in the high nitrate contamination figure of 15 percent of wells, since the EPA had stated 30 percent at one point. Vern stated that the EPA’s original assessment had given a 20 percent figure. Six years ago, another assessment had shown 12 percent, and the last round had shown 16 to 17 percent. Vern felt comfortable that 15 percent was a reasonable figure to work with. Ginny offered that the EPA sampling had been conducted on a voluntary basis. The county had a larger sample size and saw similar results. Vern returned to the point that some of the PGG data was 30 years old. Some of the identified hot spots may be cold by now, and conversely, some of the cold spots could be hot.

The purpose of conducting a continual monitoring of hot spots, in Ginny’s view, was to compile all the information we knew on public health exposure in one place. Matt thought that was more of an EPA function, and that the county was better off focusing on gathering information in areas without much data so as to present an overall picture. Jean observed that the EPA was not going to be in the Lower Valley as long as the GWMA existed, and perhaps the county should take over their monitoring work. Ginny and Vern both saw value in that suggestion, since the county had preserved the right to sample the EPA wells, with the caveat that the EPA had signed confidentiality agreements with the people they had sampled.

Gary added that if 15 to 30 percent of wells had nitrate concentrations of 10 mg/L or greater, that was a big problem that would require a lot of resources to fix. It would also be connected to any regulations or best management practices that end up getting recommended. With so many potential sources for those nitrates, it could also lead to a lot of creative testing, involving more than just nitrates.

- 3. Increasing Trends:** “Of the 46 wells with at least 10 samples that have been collected over time, seven had a statistically significant increasing trend in nitrate concentrations, and nine had a statistically significant decreasing trend. The sample locations with increasing trends warrant monitoring because they are likely most sensitive to land use changes, and may also pose a health risk if the increase is rapid enough.”

After reading PGG’s item description, Ginny stated that ambient monitoring will do this work already, to some extent. Gary stated that all trend data comes from Department of Health public supply data. Jim asked whether, if contaminated water is coming from public supply wells, public entities were doing anything to address the situation. Ginny answered that it was not uncommon for a water supplier to stop using a contaminated well and move to another. If there’s no other well available, they have to provide treatment or blend with another source.

Vern stated that Yakima County operates three to six water systems within the GWMA. They’ve never done seasonal testing on their wells, and Vern thought maybe that would be a good idea for a couple of years. Many of these are [Group B wells](#). The county’s water systems are all run under one umbrella by the Utilities Division. Vern stated that he had been talking with the Utilities manager about increasing the frequency of testing within the small systems.

Matt suggested striking the word “increasing” when talking about “trends”, noting that PGG had also observed decreasing nitrate levels in some wells. Discussing nitrate concentration trends in a neutral way would be less likely to anger people, in his view.

Vern stated that if you pulled nitrate test results on county wells over a ten-year period, you would see nitrate levels moving up and down. Ginny noted that utilities are not told when in the year they have to sample, so results from one year may have been taken in the spring, and the next year in the fall. Large variations in nitrate levels could be due to the differences in season and where agriculture is in the growing cycle. She agreed that testing public supply wells more frequently would be a good idea.

The next category on page 2 of PGG’s report is “Basin-Wide Average”. This was not included on the agenda, nor discussed as a separate item, since it tied into the fourth point.

4. **Common Water Supply Aquifers:** “The random sample set developed for the basin-wide average will likely include representative samples from common water supply aquifers. In addition, public water supply wells (sampled for WDOH) will be concentrated in these zones. Thus no separate set of wells was developed to address this objective. The ability of the basin-wide data set and WDOH water supply wells to monitor common water supply aquifers will be verified after the monitoring stations are selected.”

Jim expressed the view that any testing should not be conducted solely for the purpose of collecting data, but to correct the problem. Ginny commented that while she regulates public service wells, this is also about people in unincorporated areas who draw their water from private wells. Vern stated that it was important to have information on groundwater contamination at the deeper levels, since if the GWMA is going to give people a reason to drill a new well, they also need to know where it should go. Ginny stated that the long-term goal is to manage land in the Lower Valley so that Yakima County has a healthy water supply. Given the costs involved, drillers don’t have an incentive to keep digging deeper unless given information to support such a course.

5. **BMP Effectiveness:** In summary, PGG recommends close monitoring of shallow wells on agricultural fields for the purpose of gathering the most current information about the effectiveness of BMPs being employed.

Jim saw an implementation problem here, since most farmers don’t want to share their data or be monitored by the government. Matt offered that in Whatcom County, they offer to test fields with the intent of saying, “Does this help the farmer decide whether to pursue this idea they have?” The results of the monitoring are disclosed to the public, although the location is kept confidential. Four producers in Whatcom had accepted USGS on their offer.

Ginny agreed with Jim that it would be very difficult to get the Lower Valley agriculture community to play ball with a public monitoring program unless some of the fear and mistrust currently existing could be dissipated. In addition, while the technology to do this work currently exists, a good model for applying it isn’t as far along. Gary agreed that it takes a lot of preparation with stakeholders, based on big projects he had been involved with in the past, and that a program monitoring BMP effectiveness would have to be a five-to-ten-year program.

Vern noted that the goal of the GWAC is to have a nitrate mitigation plan put together and submitted to DOE by the end of 2017. He cautioned that some of these projects may be beyond the scope of what can realistically be accomplished. Matt and Pony both still saw some value in pursuing this objective to determine if BMPs need changing.

- 6. Health Risks:** “Drinking water wells causing human health risks will be identified by Yakima County under a separate GWMA task. Based on that work, an unknown number of monitoring stations will be added to the monitoring network.”

Vern stated that some of this work had already been done in the wellhead assessments, and wasn't sure how focusing on this point would help. He also referred to the July 19<sup>th</sup> IAWG meeting in which Paul Stoker, the former chair of the Columbia Basin GWMA, had stated that residents of shallow well rural areas were already aware there were problems in the water, and were drinking bottled water instead. Ginny agreed that most of the information the public would be getting is already known, and to the extent it isn't, this is a point better handled by the EPO working group than Data.

### Voting Results

Ginny asked each member of the group to rank their top three choices in terms of focusing GWMA resources. The vote was as follows:

	First Priority	Second Priority	Third Priority
<b>Gary Bahr*</b>	Spatial Data Gaps*	Hot Spots*	BMP Effectiveness*
<b>Jean Mendoza</b>	Water Supply Aquifer	Hot Spots	BMP Effectiveness**
<b>Jim Davenport</b>	Water Supply Aquifer	Hot Spots	No selection
<b>Matt Bachmann</b>	Water Supply Aquifer	Spatial Data Gaps	No selection
<b>Vern Redifer</b>	Water Supply Aquifer	Hot Spots	Spatial Data Gaps
<b>Pony Ellingson</b>	Water Supply Aquifer	Trends	BMP Effectiveness
<b>Ginny Stern</b>	Water Supply Aquifer	Trends	BMP Effectiveness

\*Gary did not formally rank his choices

\*\*Jean originally started out with Trends as her third choice, but requested to change to BMP Effectiveness after the voting had concluded. This led to some additional discussion on the issue, as Vern was skeptical that BMPs could be evaluated 20 years backwards since so many things had changed in the practice of agriculture over that time. Jim agreed. Pony stated that he was looking at it more from the standpoint of laying the groundwork for working with agriculture. Vern stated that he would be open to considering BMP effectiveness as a long-term goal, but not as a December 2017 goal.

Jim noted that attendance at this meeting was lower than he would like, and that it would be ill-advised to make a formal recommendation to the GWAC based on the views of only seven members, with no members from the ag community present. Ginny agreed that the PGG Report and a summary of this meeting should be made available to group members as soon as possible in order to solicit their feedback.

### **Other GWMA's – What Are They Doing?**

Steve Swope was not present at the meeting, although Ginny had been in contact with him, and received feedback that there was not much data available from other GWMA's. Pony said that he had sent Jim a list, but that it hadn't dug into the monitoring component.

### **USGS Particle Tracking Model**

Matt addressed the group as to how the tracking model covered in-depth at the last Data meeting could be applied to groundwater monitoring. The MODPATH software only tracks in saturated zones, and is less useful to apply to shallow wells. The most useful areas to sample would be the intermediate-depth wells. Matt went on to observe that the deeper the groundwater, the more everything that happens on the surface mixes together and sampling gives you an average picture of the contributions from different sources. When conducting surface sampling, you get the data for that particular point, but could be missing out on the worst areas of nitrate application.

Matt also discussed what he had heard back as far as how much it would cost for USGS to assist with groundwater monitoring. The samples themselves were very cheap, at \$10 per-sample. However, when labor and travel costs are taken into account, the cost per-sample could range from \$200 to \$300. If testing for particles beyond nitrates, the cost could go up to \$80.

Vern asked Matt for his definition of "shallow". In Matt's view, a "shallow" well was less than 50-100 feet below the water table. A "deep" well was more than 300-400 feet below the water table. Vern stated that there generally weren't a lot of great well depths in the GWMA, except along some of the northern ridges.

The meeting adjourned at 2:50pm.

### **Resources Request**

#### **Recommendations for GWAC**

---

The group had intended to settle on a recommendation to the GWAC as to what areas of the 2013 PGG report to focus their resources on, but given the small number in attendance, it was decided to put that off until a more members could weigh in with their rankings, comments, and questions.

### **Deliverables/Products Status**

#### **Proposed Next Steps**

---

Solicit feedback from Data members, with their top three choices for prioritizing groundwater monitoring dollars.