



Greater Harney Valley – Groundwater Study Advisory Committee Meeting  
Thursday, January 19, 2016  
9:00am – 4:00pm  
Harney County Community Center – 484 Broadway St., Burns, OR



## January 19, 2016 - Meeting Summary

### Participants

#### Advisory Committee Members

Allison Aldous, The Nature Conservancy  
Angie Ketscher, Citizen/Landowner  
Brandon Haslick, Burns Paiute Tribe  
Brenda Smith, High Desert Partnership  
Dan Nichols, Citizen/Landowner (not present)  
Erin Maupin, Citizen/Landowner  
Fred Otley, Citizen/Landowner  
Herb Vloedman, Citizen/Landowner  
Gary Ball, US Fish and Wildlife Services  
JR Johnson, OWRD (not present)  
Karen Moon, Harney County Watershed Council  
Mark Owens, County Commission and Landowner  
Steve Rickman, Landowner/Business Owner  
Tony Hackett, Downright Drilling  
Wayne Evans, Citizen/Landowner

#### Groundwater Study Team

Darrick Boschmann, OWRD  
Jerry Grondin, OWRD  
Justin Iverson, OWRD  
Steve Gingerich, USGS (not present)  
Terrence Conlon, USGS (not present)  
Hank Johnson, USGS (not present)  
Esther Pischel, USGS (not present)  
Amanda Garcia, USGS (not present)  
Nick Dosch, USGS (not present)

#### Others

Harmony Burrigh, OWRD (Facilitator)  
Dally Swindlehurst, OWRD (not present)  
Jason Spriet, OWRD (not present)

### Meeting Overview, Action Items, Recommendations, and Updates

---

The purpose of this meeting was to discuss methods and protocols for collecting groundwater level measurements. OWRD delivered a presentation on the steps that OWRD follows to ensure quality data collection. OWRD also provided a packet of information for those interested in following these same steps. During the work session, the advisory committee members discussed the different groundwater level data collection efforts in the basin and how the data might be similar or different. The group talked specifically about OWRD data collection efforts tied to the groundwater study, the efforts by the Harney County Watershed Council to collect data, collection of spring groundwater level measurements to meet permit conditions, and individual monitoring of wells. The meeting concluded at Downright Drilling where a subset of the group did a hands-on measurement of a well.



Figure 1. Measuring groundwater levels.

**Action Items**

<b>Who</b>	<b>What</b>	<b>When</b>
All Committee Members	Send additional comments or feedback on the Plan of Study to OWRD.	February 28
Harmony B	Upload the community groundwater level materials to the website.	February 15
Mark O	Convene additional meetings of the sub-committee to continue working on local monitoring efforts.	April 15

**Decisions/Recommendations**

- The Advisory Committee adopted the charter by consensus.

**Future Discussions**

- Review historical data and how it will be used in the study
- How deviations/outliers in the data are identified and handled
- How the monitoring network changes over time in response to what is learned about the system
- How to collect and incorporate other local knowledge/expertise/data into the groundwater investigation

**Updates**

The next meeting is scheduled for Thursday, April 20<sup>th</sup>, at the Harney County Community Center, exact time TBA. The chair (Mark Owens) and facilitator (Harmony Burright) will develop and distribute an agenda for review prior to the next meeting. If you would like to propose discussion topics, email them to: [harmony.s.burright@wrd.state.or.us](mailto:harmony.s.burright@wrd.state.or.us).

## Detailed Meeting Notes

---

### PRESENTATION

The meeting began with a 2 hour community presentation, followed by an opportunity for members of the public to make comments for the Advisory Committee to consider during their meeting.

Jerry Grondin, a groundwater scientist with the Oregon Water Resources Department (OWRD), delivered a presentation that provided an overview of making groundwater level measurements for scientific analyses, which included the following:

1. What is a groundwater level measurement?
2. Why measure the water level in a well?
3. Well documentation
4. Measurement documentation
5. Water level meters
6. Well measuring points
7. Water level measurement
8. Measurement challenges

#### Key Discussion Topics/Questions:

- OWRD confirmed that all water level data is used and useful. The usefulness of the data for various analyses increases with more site and well information that provides context, data frequency, duration of data period, measurement consistency, and measurement precision. Water level data that has accurate location data, is measured at the same point with a consistent measuring point height, is measured using calibrated equipment, and is measured to  $1/100^{\text{th}}$  of a foot 4 times in succession to ensure a static water level will generally result in the most useful data. If this same well is measured multiple times a year over a number of years it will increase the usefulness of that data since it will begin to tell a story about the groundwater.
- There was some discussion over the necessity of measuring to  $1/100^{\text{th}}$  of a foot. OWRD staff indicated that  $1/100^{\text{th}}$  is the necessary measure to confirm that the water is actually static when the reading is taken. The groundwater level measurements that are collected as a part of permit conditions require measurements be taken to  $1/10^{\text{th}}$  of a foot, which meets the requirements of those measurements. All measurements (regardless of whether they are measured to the nearest  $10^{\text{th}}$  or nearest  $100^{\text{th}}$ ) will be considered during the groundwater investigation. The individuals or organizations that collect measurements as a part of a permit condition are not required to measure to  $1/100^{\text{th}}$  of a foot, but may do so voluntarily. Increasing the accuracy of a measurement can help when it comes time to analyze the data.
- The group discussed the need to establish a consistent measuring point and measuring point height of a well. Once a consistent measuring point has been established, there is no need to re-measure the measuring point height unless the well is modified and the measuring point changes. Consistency in the measuring point and height is important to ensure quality data.

- An advisory committee member expressed interest in understanding how OWRD identifies and handles deviations or outliers in the data they collect? How is this information used to modify the network over time? How does OWRD/USGS modify its approach based on what it is finding? This will be a future discussion topic?

**Public Comments/Questions:**

- How can we (OWRD, USGS, and the Groundwater Study Advisory Committee) better acknowledge and incorporate work that has already been done or is being done locally?
- Which wells are acceptable for groundwater level measurements (considering well construction and depth)?
- Can wells without a well log be used to collect groundwater level measurements?
- The sealing processes specified in permit conditions can differ from what is contained in well construction standards, which creates confusion on-the-ground. There should be consistency between the permit conditions and well construction standards. Alternately, well drillers should have access to permit conditions.
- How can you get a true reading on a well that consistently has issues with cascading water or oil? Should we even be measuring these wells if we know the measurements may not be accurate?
- What if a permittee is not able to get a groundwater level measurement due to issues with their well? What should we do if a permittee consistently has problems getting a reliable measurement?
- How can pump installers and other installers know that a permit condition requires a groundwater level measuring tube and/or specified well construction? Is there a place they can look for that information up?
- What is the timing of different measurements? Is OWRD collecting measurements when there is the most pressure on the groundwater system (end of irrigation season - fall)?
- When does OWRD use video to better characterize problem wells?
- How is land surface elevation determined and how is that relevant to groundwater level measurements and data analyses?

**Decisions Points/Recommendations:** None

**Action Items:** None

**Proposed Future Discussion Topics:**

- Review historical data and how it will be used in the study
- How deviations/outliers in the data are identified and handled
- How the monitoring network changes over time in response to what is learned about the system
- How to collect and incorporate other local knowledge/expertise/data into the groundwater investigation

## GROUNDWATER LEVEL DATA COLLECTION EFFORTS

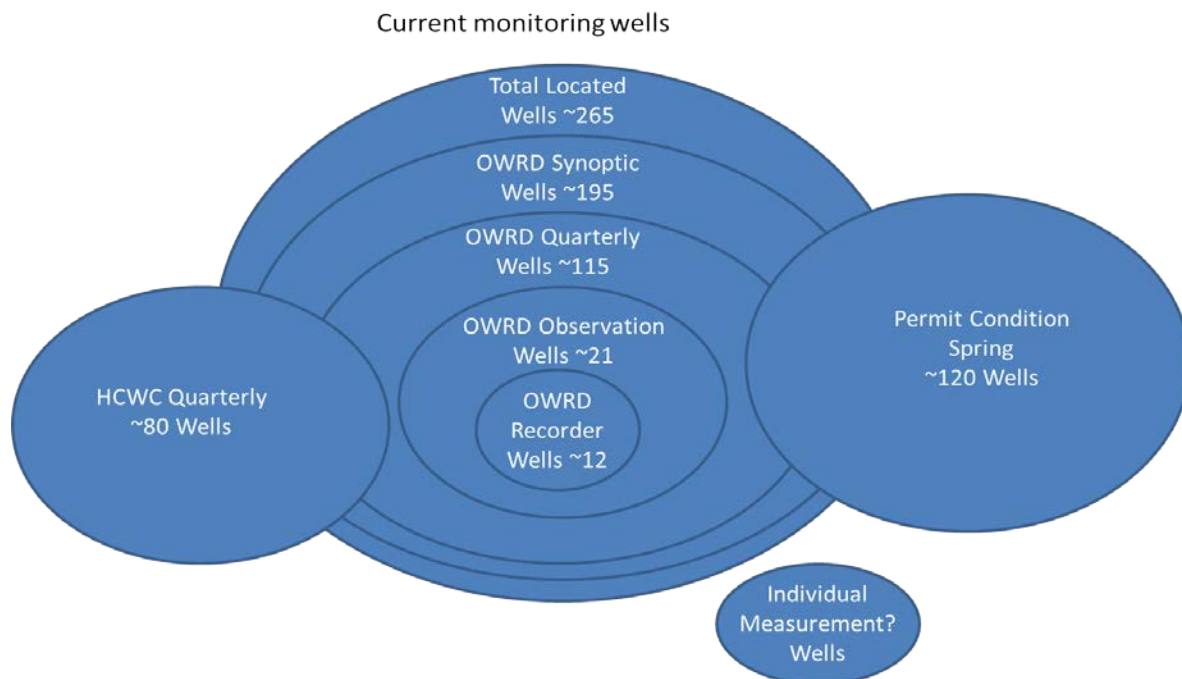
**OWRD Measurements.** OWRD currently has ~195 wells in its synoptic network that includes ~115 quarterly network wells. See a summary in the figure below. OWRD staff seek to add many more wells to the synoptic network to fill in data gap areas and to increase the well density in other areas.

**HCWC Measurements.** The Harney County Watershed Council is starting a community monitoring network. They plan to measure >80 wells on a quarterly basis in coordination with OWRD.

**Permit Condition Measurements.** There are ~120 wells that require a groundwater level measurement each spring as a condition on their permit. These measurements are collected once per year by certified water rights examiners (CWREs), water well contractors (WWC), pump installers, registered geologists (RGs), or professional engineers (PEs) and submitted to OWRD. Some of these wells overlap with the OWRD and HCWC networks (see the figure below).

**Individual Measurements.** Individual landowners measure their own wells and maintain records. Very little information is known about these measurements.

Some of these wells overlap and some of them are only measured by one group as shown in the figure below.



OWRD and HCWC plan to grow their well networks throughout the year.

**Decisions Points/Recommendations:** None

**Action Items:** None

**Proposed Future Discussion Topics:** None

## DATA COLLECTION METHODS/PROTOCOLS

OWRD outlined the steps that are used by OWRD to ensure data quality. These methods/protocols are captured in the presentation materials and the associated packet with field sheets and step-by-step instructions. Following these methods/protocols can increase the usefulness of any data collected.

- GPS coordinates
- Well documentation
  - Accurate location data
  - Well log (a well log is critical)
  - Knowledge about well construction, geology, use, etc
  - Well configuration
- Consistent measuring point and measuring point height
- Static water level measurement
  - Measured to 1/100<sup>th</sup> of a foot
  - Four measurements taken in succession to ensure a static level
- Calibrated measurement equipment
- Consistent field sheets and QA/QC procedures
- Techniques (experience troubleshooting challenging wells)
  - Record of issues or challenges with wells
- Period of record (the longer the better)

HCWC will follow OWRD's methods/protocols when they collect groundwater level measurements. All measurements will be compiled by a project coordinator who will coordinate data submission with OWRD.

Measurements collected to satisfy permit conditions have a different set of requirements and are recorded on an OWRD form. Anyone is welcome to use the community groundwater level monitoring field sheets to collect additional information that would increase the value of their measurement. Use of these sheets is voluntary, but appreciated. The more context there is for each data point, the easier it is to analyze the data. Three things that would help increase the usefulness of data is to ensure accurate location data, have well documentation, and ensure a consistent measuring point.

The difference in data collection methods/protocols is captured in Table 1.

**Decisions Points/Recommendations:** None

**Action Items:** None

**Proposed Future Discussion Topics:** None

Table 1. Data collection methods/protocols

Quality Measures	OWRD Measurements	HCWC Measurements	Permit Condition Measurements	Individual Monitoring
<b>Purpose</b>	Groundwater study	Groundwater study and individual/community knowledge	Meet permit condition requirements	Individual/community knowledge
<b>Who collects data</b>	OWRD staff	Monitoring coordinator for HCWC	WWCs, pump installers, CWRES, PEs, RGs (14 people measured wells in 2016)	Interested landowners
<b>Number of wells</b>	>200 (currently adding additional wells)	>80	~120	Unknown
<b>How wells are selected</b>	Wells that provide the most information possible and that help fill out the network	Wells in three focus areas: Weaver Springs, Crane Buchanan, and Princeton – also wells in Riley area	Wells with a permit condition for collecting annual gw level measurements	Depends on landowner interest
<b>Types of wells</b>	Domestic, irrigation, unused wells, stock wells	Domestic, irrigation, and stock wells	Irrigation wells	Unknown
<b>Distribution of wells</b>	See map	The HCWC is currently developing their network	See map	Unknown
<b>Location data</b>	GPS confirmed and correlated with well log	GPS confirmed and correlated with well log	Location data contained in permit (tied to point of diversion) and may change depending on water right process – may not be confirmed via GPS	Unknown
<b>Timing of measurements</b>	Collected 4x per year in winter, spring, summer and fall	Collected 4x per year in winter, spring, summer and fall	Collected 1x per year in spring before pumping	Unknown
<b>Years of data (period of record)</b>	OWRD has been collecting data for many years using observation wells and has recently ramped up data collection efforts	HCWC data collection has not yet begun	Varies depending on when the permit was issued (some began as early as 1994)	Unknown

January 19, 2017 – Groundwater Study Advisory Committee Meeting Summary

Quality Measures	OWRD Measurements	HCWC Measurements	Permit Condition Measurements	Individual Monitoring
<b>Age of well</b>	Varies	Varies	Varies	Varies
<b>Well tag on well</b>	Yes, add and document a tag at wells currently without a tag	Yes	Depends (some have tags)	Unknown
<b>Well log for well</b>	Yes	Yes	Depends (some have logs)	Unknown
<b>Precision of measurement</b>	1/100 <sup>th</sup> of a foot	1/100 <sup>th</sup> of a foot	Depends (1/10 <sup>th</sup> of a foot is required, but some measure to 1/100 <sup>th</sup> of a foot)	Unknown
<b>Number of measurements</b>	4 measurements in succession to ensure static level	4 measurements in succession to ensure static level	Depends (only 1 measurement is required for reporting)	Unknown
<b>Equipment</b>	eTape (calibrated)	eTape (calibrated)	Depends (generally an eTape sometimes a steel tape or air line)	Unknown
<b>Measuring point height</b>	Consistent measuring point established	Consistent measuring point established	Depends (some establish a consistent measuring point)	Unknown
<b>Measuring point height</b>	Consistent measuring point height established	Consistent measuring point height established	Depends (some establish a consistent measuring point)	Unknown
<b>Data entry</b>	Data is recorded on a field form then entered into a groundwater level database after a quality control check	Under development	Data is recorded on a permit condition water-level reporting <a href="#">form</a> and submitted to OWRD	Data is recorded and maintained by individuals and is not reported to OWRD
<b>Challenges/problems</b>	Take notes on challenges/problems encountered – wells with unreliable data may be dropped from network	Take notes on challenges/problems encountered - wells with unreliable data may be dropped from network	Wells with consistent challenges/problems are still required to have a gw level measurement – challenges should be documented	Unknown
<b>Training</b>	Registered geologists and trained hydrogeologists.	In-the field training with OWRD.	Individuals with a recognized license (WWCs, pump installers, CWRES, PEs, RGs)	Unknown