

PALOUSE BASIN AQUIFER committee

MEETING MINUTES

THURSDAY, JANUARY 19, 2023, 2:00 PM

UI, FACILITIES SERVICES CENTER, JACK'S CREEK MEETING ROOM

<https://uidaho.zoom.us/j/89476554152> (Passcode: PBAC)

Attendance

X: In-person attendance

V: Video attendance

X	Pullman: Cara Haley (Chair) City Engineer	X	Moscow: Tyler Palmer (Vice-Chair) Deputy Director, Public Works & Services
X	Pullman: Shawn Kohtz Director of Public Works	V	Moscow: Michael Parker Water Utility Manager
X	Pullman: Eileen Maccoll City Council Member	X	Moscow: Sandra Kelly City Council Member
	Whitman County: Mark Storey Public Works Director/County Engineer	X	Latah County: Paul Kimmell Citizen/County Representative
	Whitman County: Tom Handy County Commissioner	X	Latah County: Tom Lamar County Commissioner
X	WSU: Jeff Lannigan Facilities Services	X	UI: Lana Cohen Research Associate
	WSU: Jason Sampson Asst Director, Environmental Services	X	UI: Rusty Vineyard Director of Facilities
	WA, Dept of Ecology: Patrick Cabbage Unit Supervisor/Hydrogeologist	V	ID, Water Resources: Michelle Richman Regional Manager/Staff Engineer
V	WA, Dept of Ecology: Chris Beard Hydrogeologist		ID, Water Resources: Daniel Sturgis Hydrogeologist

Others:

Céline Acord, PBAC Executive Director (X); Steve Robischon, PBAC Technical Advisor (V);

Kyle Duckett, Alta Science & Engineering (X)

Community Members:

Jeanne Elliot (X); Allison Lebeda, Nez Perce Tribe (V); Melissa Makelvie (V); Cristin Reisenauer, City of Pullman (V); Colt Shelton, JUB (V)

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**Denotes Action Items*

1) Introductions

Meeting called to order at 2:01pm. Roundtable of introductions of in person and online participants.

2) *Approval of Minutes ([Video Link 04:20](#))

a. November 17, 2022, Meeting Minutes - [Attached](#)

Motion:	Approve November 17, 2022, Minutes
Mover:	Vice-Chair Tyler Palmer
Second:	Shawn Kohtz
Result:	ALL IN FAVOR, MOTION CARRIED

3) Public Comment for Items not on Agenda

a. None

4) Unfinished Business

a. None

5) New Business ([Video Link 04:58](#))

a. Appointments:

- i. UI Temporary Appointment: Lana Cohen
- ii. City of Moscow Appointment: Sandra Kelly

6) Presentation & Discussion

a. Update: 2022 Datalogger Downloads – Kyle Duckett & Steve Robischon ([Video Link 08:22](#))

i. 2022 Monitoring Event Summary Document - [Attached](#)

Kyle provided an update on the 2022 datalogger downloads. The contract was executed successfully and within budget. Next year's work will require 4 dataloggers to be replaced, and Alta's fees have increased, so expect a slight increase for 2023.

Steve provided background information on the process to download information from the dataloggers and the bigger picture of why we should care about the water monitoring process. ([Video Link 22:47](#)) Further discussions were had regarding connectivity within the aquifers and the importance of continuing research and analyzation.

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b. Genesee Well Chip Samples – Steve Robischon, Kyle Duckett & Céline Acord ([Video Link 1:02:00](#))

The City of Genesee drilled two wells, the first not being successful finding water and the second drilling into the Grande Ronde Aquifer. Steve recommended chip samples from the well drillings be analyzed to determine if there are similarities from other well sites and if Genesee is within the Palouse Basin Aquifer System. John Bush has provided direction for Kyle to perform initial reviews of the samples. Kyle will provide a scope of work to determine the costs of analyzing the chips. Further exploration with the City of Genesee, IDWR and Alta will determine if PBAC could place a datalogger in the well. The Technical Subcommittee should assist in reviewing these details before the Committee approves anything.

c. Update: Alta Extension Contract – Céline Acord ([Video Link 1:08:05](#))

A status update was provided reviewing Alta's work to date. Their extension contract began in August 2022 to provide additional outreach and refinement assistance. The contract was for \$50,000 and \$29,651 remains. Currently, Alta is assisting with meetings with state agencies. Discussion with the Committee was to confirm what next steps should be taken. The remaining funds should be used to create a scope of work/next steps for Alternative 5, focusing on water treatment and water rights. The Technical Subcommittee should assist with crafting and reviewing the scope of work as well.

7) Subcommittee Reports ([Video Link 1:24:37](#))

a. Budget – Céline Acord & Rusty Vineyard

A brief update was provided regarding PBAC's financials:

Admin Balance:	\$166,240.80
Research Balance:	\$256,040.38

The next Budget Subcommittee Meeting is February 7 at 10am.

An update was provided regarding UI's contributions and support for PBAC:

- UI has historically housed PBAC since its inception and have contributed to PBAC with an annual admin fee and a research fee (current fees are \$27k and \$20k, respectively). Starting in FY20 the research contribution amount stopped due to UI's budget crisis.
- The VPs of Research and Finance met with President Green and have given PBAC a list of requirements before continuing their contributions. They are as follows:

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- UI won't continue research payments until PBAC provides a research plan.
- If there's no research plan, then PBAC needs to provide an implementation plan instead. That would need to include a spend-down plan for how they intend to use the "hundreds of thousands of dollars that they have accumulated in the research fund".
- If a plan isn't provided to UI, all support from UI will be eliminated in FY24 (July 2023). UI will withdraw from everything – contributions, leave the Committee, and PBAC would need to find a different host entity.

The Committee discussed how to proceed, confirming this should be a top priority over the next couple months. With regards to budget accountability/spend down plan, a combination of the Technical and Budget Subcommittee will work on prioritizing a plan. This will help satisfy UI but also inform all PBAC entities of the work ahead. As for research funds, while PBAC's future might be more applied research, or technical research, there is much in the way of history of PBAC supporting research efforts at UI and WSU. All of this should be included in the deliverable to UI. Money has been well spent over the years but it's a balance of prioritization and keeping an appropriate amount of funds available as its slow to grow. Further discussions will take place to clarify what criteria UI is looking for, and if there are structural and/or fundamental concerns with PBAC, to ensure an appropriate product is delivered.

b. Communications – *Paul Kimmell*

We've received initial text and concept sketches from Fuse for the Alternative 5 and Aquifer 101 graphics. We'll continue to work through those details, and the other graphics (Alternatives 1-4) and hope to have something to show the Committee next month. Until graphics are complete, public outreach will not yet begin.

c. Research – *None*

No meetings have occurred. Need to convene a meeting to discuss Alta's next steps and overall implementation planning and discuss new subcommittee chair.

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8) Other Reports and Announcements ([Video Link 1:47:46](#))

a. None

Shawn Kohtz has submitted his resignation to the City of Pullman. This will leave a vacant seat for the City of Pullman within PBAC and within the Technical Subcommittee.

9) Next PBAC Meeting:

a. Thursday, February 16 at 2:00 PM

10) Adjourn at 3:50pm

Motion:	Adjourn
Mover:	Jeff Lannigan
Seconder:	Eileen Maccoll
Result:	ALL IN FAVOR, MOTION CARRIED

Minutes Adopted at the February 16, 2023 Meeting

PALOUSE BASIN AQUIFER committee

***DRAFT* MEETING MINUTES**

THURSDAY, NOVEMBER 17, 2022, 2:00 PM
UI, FACILITIES SERVICES CENTER, JACK'S CREEK MEETING ROOM
<https://uidaho.zoom.us/j/84146537732> (Passcode: PBAC)

Attendance

X: In-person attendance

V: Video attendance

X	Pullman: Cara Haley (Chair) City Engineer		Moscow: Tyler Palmer (Vice-Chair) Deputy Director, Public Works & Services
X	Pullman: Shawn Kohtz Director of Public Works	V	Moscow: Michael Parker Water Utility Manager
X	Pullman: Eileen Maccoll City Council Member	X	Moscow: Gina Taruscio City Council Member
X	Whitman County: Mark Storey Public Works Director/County Engineer	X	Latah County: Paul Kimmell Citizen/County Representative
X	Whitman County: Tom Handy County Commissioner	X	Latah County: Tom Lamar County Commissioner
	WSU: Jeff Lannigan Facilities Services	X	UI: Tim Link Professor of Hydrology
	WSU: Jason Sampson Asst Director, Environmental Services	X	UI: Rusty Vineyard Director of Facilities
X	WA, Dept of Ecology: Patrick Cabbage Unit Supervisor/Hydrogeologist		ID, Water Resources: Michelle Richman Regional Manager/Staff Engineer
	WA, Dept of Ecology: Chris Beard Hydrogeologist		ID, Water Resources: Daniel Sturgis Hydrogeologist

Others:

Céline Acord, PBAC Executive Director (X); Steve Robischon, PBAC Technical Advisor (V);
Robin Nimmer, Alta Science & Engineering (X); John Bush, UI Emeritus Professor of Geology (X)

Community Members:

Dale Ralston (X); Pamela Dunlap (X); Jeanne Elliot (X); David Hall, SEG Member (X), Diane Cornelius (V);
Sarah Dawson, UI Sustainability Director (V); Lana Cohen, UI (X); Jeff Langman, UI (X);
Brook Chase, Nez Perce Tribe (V); Cristin Reisenauer, City of Pullman (V);
Taylor Musburger, City of Pullman (V); Kyle Duckett, Alta Science & Engineering (V)

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**Denotes Action Items*

1) Introductions

Meeting called to order at 2:00pm. Roundtable of introductions of in person and online participants.

2) *Approval of Minutes ([Video Link 04:17](#))

a. September 15, 2022, Meeting – [Attached](#)

Motion:	Approve September 15, 2022, Minutes
Mover:	Gina Taruscio
Seconder:	Eileen Maccoll
Result:	ALL IN FAVOR, MOTION CARRIED

3) Public Comment for Items not on Agenda

a. None

4) Discussion ([Video Link 04:17](#))

a. Water Summit Feedback – [Survey Results](#)

Committee reviewed survey results and provided feedback.

b. Leadership Roundtable Feedback

Committee members provided feedback. As laid out, the Roundtable was very open ended. Next time consider it to be more formalized with action items and specific purpose. Consider having it twice a year to keep the collaboration current. The one-pager provided could be edited to directly explain the preferred Alternative and use less words with more images.

c. IDWR Regional Water Sustainability Project Application – [Website Info](#)

The Idaho Water Resource Board (IWRB) has a formal process to be placed on the Water Sustainability Project List. Applications are due by December 1, 2022. PBAC will be submitting the report with the five alternatives. This will hopefully set the stage to provide funding in the future. A side note, IWRB's July meeting will be held in Moscow.

5) Unfinished Business

a. None

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6) *New Business ([Video Link 04:17](#))

a. Proposal for Infographics – [Attached](#)

The need for infographics will help communicate PBAC's mission – to educate about the aquifer and the need for an alternative water supply – in next year's public engagement process. The consultant has a team with backgrounds in natural and environmental sciences which lends to their expertise in assisting PBAC. The contract is for \$9,000 and shall be paid from the Administrative budget.

Motion:	Approve Contract with Fuse, Inc.
Mover:	Paul Kimmel
Seconder:	Tom Handy
Result:	ALL IN FAVOR, MOTION CARRIED

7) Presentation & Discussion ([Video Link 04:17](#))

a. John Bush: *Review of Research from 2009 to the Present about Miocene Aquifers in the Moscow-Pullman Area and Basic Facts about the Aquifers* – [Attached](#)

John Bush presented on the previous research conducted regarding the Basin. He will be presenting additional talks the week after Thanksgiving.

8) Subcommittee Reports ([Video Link 04:17](#))

a. Communications – presented by Subcommittee Chair Paul Kimmell

The subcommittee will be working on collateral with Fuse before scheduling any public events. More to come in the new year.

b. Budget – presented by Subcommittee Chair Rusty Vineyard

The subcommittee is working through budget projections as more funds will be needed to continue standard operating procedures in the next 2-3 years. Ongoing discussions with UI regarding their research contributions and how to receive the awarded Latah County ARPA funding.

c. Research – presented by Subcommittee Chair Shawn Kohtz

During the subcommittee's last meeting Steve Robischon provided the subcommittee with an in-depth review of water volumes for a few of the alternatives. The subcommittee also discussed the recent modeling efforts that weren't as fruitful as expected. Discussions around working on another modeling effort were explored but ultimately the decision was to focus on any technical needs for the alternative water supply projects. To that end, the subcommittee might consider being renamed to "Technical Subcommittee".

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9) Other Reports and Announcements [\(Video Link 04:17\)](#)

a. FY23 Assessments

Have received assessments from Moscow, Pullman, WSU and UI (Admin only). Still have yet to receive Latah, Whitman and UI (Research).

b. AWRA Conference Update

Céline Acord provided an update on the American Water Resources Association conference she attended at the beginning of November.

c. UI Rep Tim Link Upcoming Sabbatical

Tim Link will be on sabbatical in spring 2023. Committee should consider a temporary replacement(s) and will take a formal vote at next month's meeting.

10) Next PBAC Meeting:

a. December's Meeting: Thursday, December 15th at 2:00pm

11) Adjourn at 4:01pm

Motion:	Adjourn
Mover:	Shawn Kohtz
Second:	Rusty Vineyard
Result:	ALL IN FAVOR, MOTION CARRIED

MEMORANDUM

To: Céline Accord, Palouse Basin Aquifer Committee
Steve Robischon, Palouse Basin Aquifer Committee

From: Kyle Duckett, Project Manager

Date: December 1, 2022

Contract No./Title: PSA A22-013

Alta Project No.: 22025-30

Subject: **2022 Palouse Basin Aquifer Committee (PBAC) Groundwater Monitoring Network Datalogger Download Summary**

1 Introduction

Alta Science and Engineering, Inc. (Alta) performed annual datalogger downloads and maintenance for the Palouse Basin Aquifer Committee (PBAC) in support of PBAC's long-term groundwater monitoring network. Dataloggers record water levels throughout the year and the data are downloaded and processed annually. The following memorandum summarizes network monitoring and maintenance completed in 2022. Monitoring procedures and data processing/delivery was completed as described in the August 2022 Scope of Work (SOW). The following sections summarize the collection, data processing, and subsequent recommendations. Alta transferred the data to Steve Robischon, the PBAC data analyst, for further processing.

2 Summary of Events

Alta completed an annual download event for all monitoring sites, replaced dataloggers, and conducting additional maintenance described below.

2.1 Annual Download Event

Alta's field crew visited 34 wells within the PBAC monitoring network between August 12, 2022 and September 22, 2022 and downloaded dataloggers. At least one active datalogger was present at all 34 monitoring locations, and a barologger at intended locations. Dataloggers from all 34 sites and all barologgers successfully provided a representative time series data file for the entire time period.

The Idaho Department of Water Resources (IDWR) deploys several In-Situ brand dataloggers and an associated barologger at select IDWR monitoring wells just north of Moscow, Idaho. In order to access these dataloggers, Alta acquired an In-Situ brand datalogger downloader attachment for the 2022 download event. Alta field crews downloaded IDWR In-Situ brand dataloggers for the first time in 2022 (IDWR 1 and IDWR 4) to support monitoring at these locations.

Field notes were delivered to Steve Robischon following each day of downloads. Alta recorded all field observations in the logbook and communicated with Steve to support any necessary adjustment to the groundwater elevation time series data during his processing. Potential irregularities observed in the field each year are relayed to Steve who used his best judgement to apply appropriate corrections to time series data while appending historical groundwater elevation data sets with the new data. General notes from 2022 are listed in Section 4 of this report.

2.2 Datalogger Replacements Based on 2021 Recommendations

Alta completed datalogger replacement at five monitoring locations as recommended in the 2021 summary memorandum (Table 1). Field crews equipped all sites with a new Solinst® datalogger Levellogger 5 model with a lithium-ion battery expected to last 10 years or more at the deployed monitoring and download frequency. Older loggers were left in place when possible to provide redundancy and assist in the data processing transition to the new datalogger. Legacy dataloggers will be assessed during each event and removed when they stop functioning.

Table 1. Dataloggers Replaced in 2022 Following 2021 Recommendations

Monitoring Location	Date of Replacement	Replacement Datalogger Brand	Date of Purchase	Model	Serial Number
Following 2021 Recommendations (New Dataloggers)					
Brandt	9/22/2022	Solinst®	August 2022	LL5 M10	2161950
PCEI	9/1/2022	Solinst®	August 2022	LL5 M10	2161926
Pullman 3	8/29/2022	Solinst®	August 2022	LL5 M10	2161927
WSU Plant Pathology	8/29/2022	Solinst®	August 2022	LL5 M10	2161942
IDWR 4	9/22/2022	Solinst®	August 2022	LL5 M10	2161958
Additional Replacement (PBAC Spare Datalogger)					
WSU Test	9/20/2022	Solinst®	2011	LL Edge M10	2003983

2.3 Additional Maintenance Items

Based upon field observations, Alta evaluated the need for additional maintenance and/or modifications to the dataloggers. Alta discussed modifications to Washington State Department of Ecology (WDOE) equipment with Patrick Cabbage (WDOE) as documented in a November 3, 2021, email providing permission to adjust dataloggers as necessary. The following adjustments were made in 2022:

- On August 16, 2022, Alta raised the WDOE datalogger at Pullman Yard Shallow to sit approximately two feet off the bottom of the well casing.
- On September 20, 2022, Alta lowered the WDOE datalogger at WSU Test Well down the well casing until approximately two feet off the bottom to ensure the datalogger is submerged and collecting representative data for as many years into the future as possible (Table 2).

- Two spare PBAC dataloggers were deployed in 2021 at WSU Test well to support data collection at this site. Upon visiting the site in 2022, the Alta field crew noted one of the spares installed in 2021 (SN: 1058681) was found dead and replaced with a newer spare PBAC datalogger SN: 2003983 (Table 1). Alta will remove these spare dataloggers once the WDOE datalogger is confirmed to be collecting representative data.
- Alta resuspended the Elliott and Brandt dataloggers on September 22, 2022. The Elliott datalogger was lowered down the well casing to ensure data collection while the well is experiencing drawdown, and the Brandt datalogger was resuspended to better fit inside the monitoring tubing.

Table 2. Additional Maintenance Items

Monitoring Location	Basic Description of Maintenance Performed
Brandt	Resuspended the datalogger using 40-pound test fishing line to approximately 30 feet (ft) below the present water level.
Elliott	Datalogger lowered approximately 20 ft further down the well casing given a shallow overlying water column noted during the previous event.
Pullman Yard Shallow	Raised datalogger in well casing so that it is approximately 3 ft off the bottom and hanging freely.
WSU Test	Lowered WDOE datalogger so it is submerged and collecting representative data.

3 Data Processing

The field crew recorded procedures, observations, and pertinent data in the project logbook and dedicated field sheet (Attachment A). Alta personnel worked with Steve Robischon to review and quality control the data. After each field day, the datalogger data were exported to the desired format (.csv files) and emailed to Steve for processing. The instructional binder completed in 2019 by Alta and the PBAC datalogger status spreadsheet were updated as needed. The binder includes contact information for well owners and representatives as well as status updates for all PBAC-owned equipment. After field collection concluded, Alta emailed data for the Washington locations (.csv files) to Patrick Cabbage with WDOE.

4 General Notes

Notes and observations recorded by field crews are relayed to Steve Robischon to assist in data processing where applicable, and if necessary are recorded in the PBAC binder and datalogger status spreadsheet. General notes from 2022 include:

- The private domestic production well which houses the “Shumway” datalogger has changed ownership. The new owners of the property are excited to continue working with PBAC and will continue to allow PBAC to deploy a datalogger at their residence.
- The INEL monitoring wells are located on the University of Idaho campus at the Groundwater Field Laboratory, and make use of a shared outer well casing. In 2022 the well cap was found removed, exposing the two inner well casings. Alta coordinated with Jerry Fairley at the University of Idaho, and will outfit this well casing with a Masterlock in

2023 to ensure the safety and representative data collection of the PBAC owned dataloggers.

- IDWR monitoring wells IDWR 2 and IDWR 3 are currently utilizing older Insitu Rugged Troll brand dataloggers which are not compatible with the new PBAC owned Insitu Aquatroll 400/500 datalogger downloader. These Rugged Troll dataloggers are being phased out by IDWR and these locations will soon be equipped with Aquatroll 400 dataloggers similar to monitoring wells IDWR 1 and IDWR 4.

5 Recommendations

Alta recommends installation of four new dataloggers in 2023 as detailed in Table 3 to ensure data gaps will not occur at these locations resulting from dead dataloggers. Alta recommends the continued use of Solinst® dataloggers where applicable based on prior battery life performance and software compatibility.

Table 3. Datalogger Replacement Recommendations for 2023

Monitoring Location	Datalogger Brand	Date of Purchase	Remaining Battery Life	Comment
WSU 5	Solinst®	2012	100%	Based on age
INEL Deep	Solinst®	2013	100%	Based on age
INEL Shallow	Solinst®	2013	100%	Based on age
WSU Dairy	Solinst®	2013	100%	Based on age

Attachment A
Field Sheets

8/12/22 PBAC Annual 2022 KD

• 2022 Annual Download Event for all sites
 Trailgate Safety:

Bees / horses

Remote sites - cell service spotty

Traffic

Livestock / horses again

Arrived on site at 1330 at INEL sites

Weather in partially cloudy 80° ATM: 1014.2 at 1300

• INEL Deep SN: 2022887 Battery: 100%
 DTW: 68.89 ft bgs WL: 46.9195 at 1300 LL4
 Time: perfect; plenty of space left, not reset

• INEL Shallow SN: 2022884 Battery: 100%
 DTW: 34.22 ft bgs WL: 47.4663 at 1300
 Time: 8 min slow; not reset. Plenty of room left

• logger suspended by rope; rope not suspended all the way down. Beware of weird data due to others accessing this well. See Pic. LL4 a few inch difference vs. how I suspended it. 1400 reading is bad; returned by 1415. → I resuspended like normal.

• Arrived on site at SAS Path LL5 at 1430. SN: 2131191 80° Sunny ATM: 1014.4 at 1400
 DTW: 17.25 ft bgs WL: 41.6434 at 14:00
 Battery: 97% LL5... Time: Perfect! not reset returned to well by 1450. 1500 reading should be OK.

KD PBAC Annual 2022 8/12/22

• Arrived on site at SAS Creek at 1500.

SN: 2088945 LL4 Battery: 100%

DTW: 1.68 ft bgs WL: 33.2746 at 1400

• no pump. time ~~perfect~~ 14 min slow; not reset

Returned by 1515.

ATM 1013.9 at 1500

• Arrived on site at Arboretum at 1525.

SN: 2123336 LL4. Battery 100%

DTW: 13.03 ft bgs WL: 38.3316 at 1500

Time: 10 min slow; not reset. plenty of space
 Returned to well by 1550; left site by 1600.

KD PBAC 2022 8/16/22

Weather: 92° Hot/Sunny ATM: 1016.7^{at 1300}

- Arrived onsite at DOE at 1300

DTW: 256.28 ft bgs. WL: 103.634

Time: 30 min slow; not reset. at 1200

Battery: <10% yes replaceable; no, not replaced. Returned to well by 1345.

INW ↑ ~~* Diver still dead~~; returned to well.

INW Baro ↓ SN: 21739060

Removed from well at 1340; returned by 1405

Time: 6 min fast; Battery: <10% ^{not} replaceable

SN: 21641015 No Issues; left site by 1400.

WL: 31.061 at 1300; for baro. 1410

Reset baro due to space issues; started at 1400; 1st reading outside well.

- Arrived at Cornelius well at 1420.

Logger removed at 1430; well on and Pump running until ≈ 1435. SN: 2123513

DTW: 202.55 ^{at 1443} WL: 58.3499 at 14:00

Time: 2 min slow; not reset Battery: 100%

DTW... consistent at 202.55 at 1455. ^{Pump still off}

Logger returned by 1500; left site by 1505.

- Weather: 92° Hot ATM: 1015.7 at 1500.

Arrived at Pullman Yard Deep at 1530.

Removed from well by 1535. SN: 21445032

DTW: 97.95 ft. ← INW → WL: 64.933 at 1500.

Battery: 100% Time: 18 min slow; not reset.

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> Pullman Deep (Cont.) - returned to well by 1555.

Diver: WL: 64.40918 SN: D8034

Battery: 54% Time: 2 min fast; reset due to space

↳ returned to well by 1555.

at 1600. Future start 1600.

- Pullman Shallow - SN: 21645002

DTW: 97.75 ft bgs WL: 65.821 at 1500.

Battery: <10% replaceable; not replaced. Time: 28 min slow

Returned to well by 1610. Not Reset.

↳ Raised ≈ 3 ft in water column so it's not resting on the bottom of the well; not sure if well is sitting in? But there is plenty of water column left, so I raised it a bit.

- Arrived at Flat Rd well at 1635. INW removed from well by 1640 SN: 21445034

DTW: 234.47 ft bgs WL: 56.736 at 1600

Battery: 100% Time: 37 min slow; not reset.

Returned to well by 1700. INW ↑

• Diver → WL: 55.94324 Battery: 54% ^{at 1600}

Time: 2 min fast; reset due to space;

future start at 1800; returned to well by

1810. SN: D8008 for Diver.

- Weather: 96° Hot! ATM: 1015.1 at 1700.

Arrived at Grange well at 1720.

DTW: 44.24 INW SN: 21548029

Battery: <10%, replaceable but not replaced

KD PBAC 2022 8/16/22

~~WL~~ INW (cont.) Time: —~~Time~~ → WL: 58.667 Time: 50 minBattery: <10%, not replaced. ^{at 1600.} not ^{slow} resetDiver → ~~Time~~ Time:

Battery: Dead; would not connect (KD)

Returned both loggers to well by 1745.

- Arrived at Banner Rd well at 1820.

Landfill was closed... remember that for next time.

Banner has 4 loggers total. ^{2 Diver} ^{2 INW}Diver Baro → SN: Dead; won't connectINW Baro SN: 21644068 Battery: <10%

Time: 50 min slow WL: 31.090 at 1700

not reset. Replaceable batteries, not replaced.

INW Datalogger SN: 21445027 Battery: 100%

Time: 50 min slow WL: 58.225 at 1700

not reset. Replaceable batteries, not replaced.

Diver datalogger ~~SN~~ SN: D8047 Battery: 54%

Reset due to space restrictions; future start

at 20:00. Time: Perfect, —

WL: 57.69056 at 1800. —

DTW: 199.67 ft bgs; stable.

Returned to well by 1915; left for office 1920.

KD

KD


KD

KD

KD PIBAC 2022 8/29/22 55

- *measure P3 ✓ and replace datalogger ✓
- *replace WSU Plant Pathology Time: 2 min slow

• Arrived onsite at Pullman 3 at 9:00.
Weather: 70° Sunny Atmosphere: 1018.9 at 900.
SN: 2003977
DTW: 105.18 ft. WL: 49.3742 at 9:00
Datalogger removed due to age, replaced w/
new LLS SN: 2161927. Old logger will be spare.

*DTW taken from hole in top of cover, same as
2021.  - pipe off side is \approx 3 inches
deep. BUT DTW taken
future start at 1000. through top hole. No Pump

• Arrived on site at Pullman 5 at
1000. DTW: 212.32 ft. WL: 31.1628 at 1000.
Battery: 100% Time: 15 min fast; not reset
plenty of space. SN: 2124093

DTW taken from pipe on side of pump,
Same as 2020. Pullman workers subtract ~~1~~
from 1 foot from this for their DTW.
Pump Running upon arrival, waited \approx 15 min
after shut off to take DTW. Seemed stable
over several minutes.

• Arrived onsite at Landfill 1045,
checked in w/ weigh station. ~~SA~~ 1 Diver +
DTW: 123.90 ft ~~WL~~: ——— 1 INW
Weather: 78° Sunny ATM: 1019.1 at 1100
Loggers removed \approx 1055.

Rite in the Rain

KD PBAC Dataloggers 8/29/22

> Landfill (cont.) → WL: 57.986 at 1000.

INW: SN-21445031 Time: 39 min slow

Battery: 100% ; not reset, plenty of room.

Diver: SN-D8061 Time: 4 min fast

Battery: 54% ; Reset due to space.

WL: 56.84848 at 1100. Returned to well by 1130.

• Arrived onsite at WSW Plant Path. 1150

DTW: 30.30 ft. SN: 1064664 Removed by 1205. Time: 2 min fast; ~~not reset~~.

Battery: 99% WL: 28.4909 at 1200.

Replaced w/ new LLS logger SN: 2161942

Returned to well by 1230.

Pump not running upon arrival and did not kick on. DTW Solid; outer well casing.

~~R/C Duckett~~~~KD~~~~KD~~~~8/29/22~~

KD PBAC 2022 9/1/22⁵⁷

*PCEI, Brndt to replace. ~~IDWR 4?~~ (KD)

*Lower Elliott logger potentially; look at WL

• Arrived onsite at Palouse 3 1030

met w/ Mike from City of Palouse

Weather: 82° Sunny ATM: 1016.5 at 1000

DTW: 269.08 ft. WL: 44.12156

Diver SN: Y1745 Time: 3 min slow

Battery: 95% not reset; plenty of room

Removed from well \approx 11:00. Returned to well by 1130. Pump did not run while on site, DTW Solid.

• Arrived onsite at Butte Gap 1130.

SN: 21548023 Removed from well by 1135.

DTW: 270.63 ft. WL: 61.665 at 1000.

Battery: <10% replaceable; not replaced \uparrow

Time: 42 min slow; 11:00 sending bnd.

not reset \leftarrow Returned to well by 12:00.

• Arrived at Shumway well; House¹²³⁰

empty, not currently occupied. I tried DTW: 37.22 ft ~~WL:~~ to check in.

No one was present; obvious signs of construction underway. Logger was disturbed; not how I left it.

Rope was tangled in well wiring.

Lid was not tight on casing.

I replaced it as it should be. *Rite in the Rain*

KD PBAC 2022 9/1/22

> Shumway (Cont.) - removed from well by 1235. Time: 20 min slow; not reset

Battery: 100% WL: 35.9020

Pump not running upon arrival; logger returned to well by 1245. DTW was recovering actively → 35.83 at 1245.

• Arrived on site at Appaloosa 1450. SN: 2049400 removed from well at 1500.

DTW: 88.99 ft WL: 54.9704 at 1500.

Battery: 100% Time: 15 min fast, not reset. DTW ^{Solid!} Pump not running upon arrival; not running while on site. Left site by 1550.

• Arrived on site at PCEI 1600.

SN: 2003983 Removed from well 1610.

DTW: 125.40 ft WL: 49.1879 at 1600.

Battery: 100% Time: 19 min fast

Pump not running upon arrival; DTW Solid! pump did not run at all. Celine onsite for Appaloosa + PCEI.

> New LLS installed based on age; SN: 2161926. Returned by 1645.

• Arrived at IDWR 2 at 1330.

Solinst LL4. SN: 2088841 → Removed by 1340.

DTW: 146.38 ft WL: 49.1674 at 1500

Battery: 100% Time: 7 min slow; not reset.

IDWR ~~HOB~~ Insitu Rugged Troll 100 SN 474269. Range mto F30

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IDWR 2 (cont) - loggers returned to well by 1700. IDWR logger could not be downloaded due to WRONG DONGLE?! Miscommunication w/ Daniel? ... Rugged Troll vs Level Troll 400 I took pics this time...

• Arrived at IDWR 3 at 1805.

SN: 2088569 Removed by 1810

DTW: 145.51 ft WL: 49.5990 at 1700.

Battery: 100% Time: 12 min slow; not reset.

IDWR logger is the Rugged Troll 100 again...

Returned to well by 1825.

• Arrived at IDWR left site for office.

~~PyC Docket~~

~~KD~~

~~KD~~

~~9/1/22~~

KID PBAC 2022 9/5/22

- Arrived onsite at IDWR 1 at 1720
Weather: 75° Sunny ATM: 1018.1 ^{at 1700}
DTW: 37.52 ft; 4 loggers Present
- Datalogger - LL4 - SN: 2088849 Battery: 100%
Time: 1 min slow; not reset WL: 44.7105 ^{at 1700}
Logger returned by 1745.
- Solinst Gold Baro - SN: 1023352 Battery: 96%
Time: 10 min fast; not reset. WL: 2.7432 at 1700
- Solinst LLS Baro - SN: 2131125 Battery: 97%
Time: Perfect; not reset WL: 92.4516 kPa at
Attempted to change units for level 1800.
values vary from kPa, but LLS Baros do
not give an option for Level in "ft".
- IDWR logger is a Level Troll 400!
SN: 380511 Battery: 58% Time: 1 min fast
WL: 50.050 at 1700. 1800 reading bad
Logger not reset; returned to well by
1840. Rugged Troll loggers must be ^{out.} phasing
- Arrived at IDWR 4 at 1850. 3 loggers
- SN: 1064666 Removed From well by 1855.
Battery: 99% Time: 1 min fast; not reset.
WL: 29.2121 at 1800. DTW: 389.99 ft.
- IDWR Datalogger Troll 400 SN: 450905
Battery: 59% Time: 5 min slow
- WL: 43.934 at 1845. Not reset
Returned to well by 1930.

KD PBAC 2022 9/5/2022⁶¹

- IDWR 4 (cont.) -

IDWR Bravo Troll 500 - SN: 384944

Battery: 60% Time: 20 min fast

WL: 371.078 in H₂O at 1900. Not Reset

↑ inches H₂O I believe; will investigate

Returned to well by 1930.

Left site by 1940.

~~KyC Dault~~

~~KD~~

~~KD~~

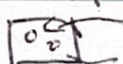
~~9/5/2022~~

KD PBAC 2022 9/20/22

• Arrived onsite at WSU 5 at 800.
 Weather: 51° Sunny ATM: 1016.3 at 800
 Time: 12 min fast; reset Battery: 100%
 due to space requirements, SN: 2007043
 DTW: 270.62 ft. WL: 46.4246 at 800
 Returned to well by 8:45.

• Arrived onsite at WSU 3, 900.
 weather: 56° Sunny ATM:
 Time: 5 min slow; not ^(KD) reset Battery: 100%
 PBAC Solinst ↑ SN: 2088838 WL: 49.0079 at 8:31
 WDOE INW - SN: 21645008 Time: NA

Battery: NA WL: NA
 Returned to well by 9:30.

DTW ↑: 130.34 ft taken down PBAC
 monitoring slot  PBAC,
 WDOE

PBAC logger reset given it was taking readings
 at x:30 instead of on the hour.

→ WDOE logger dead batteries; would not DL.
 No batteries on hand. Returned to well.

• Moved to new note book due to lack
 of space KD

KD

9/20/22

Rys Dredgett

9/20/22 PBAC Notes 2022 KD

weather: 65° Sunny ATM: 1016.0 at 9:00

- WSD Test - 930

DTW - 1: 129.12 WDOE
2: 129.01 PBAC 1
3: 129.08 PBAC 2

* 6 loggers - 2 PBAC Solinst - 1 Gold SN: 1058681

Total

- 1 Silver SN: 1025058 ✓ X DEAD; Removed

- 2 PBAC Solinst Baros SN: 1023553 Silver Baro ✓

Removed from

LLS Baro SN: 2131127 ✓

well by 935.

- IDWR - high and dry - Did not Download this year...

- Lowered logger until it was submerged ≈ 2 ft off the bottom of the well

- PBAC Diver - SN: C7187. X DEAD Removed

> PBAC Baro Silver - 21025058 - Time: 1 min fast, not reset.

Battery: 96% WL: 2.8663 at 900

> PBAC Baro LLS now - SN: 2131127 - Time: 1 min slow; not reset

Battery: 96% WL: 93.1388 KPa at 900.

> PBAC logger Silver SN: 1025058 Battery: 98% Time: perfect
WL: 8.3803 at 9:00 am. Returned to well

* Installed "NEW" spare logger SN: 2003983 future start ~~1000~~ 1100
for removed logger SN: 1058681. This was the spare from PCEI. (KD)

weather: 70° Sunny ATM: 1015.7 at 1100

WSD Dairy - 1040 - SN: 2022901 Time: 14 min fast; not reset

Battery: 100% WL: 41.6462 at 1050 ... 10 min before hour

DTW: 322.82 ft at 1045.

↳ not reset

= 4 min fast w/ time offset.

Moscow Sites

To Do:

- > PD
- > Bond
- > Cemetery
- > Elliott
- > Brandt
- > IDWR 4

KD PBAC 2022 4/22/2022

Weather: 55° ^{5 min showers} ATM: 1015.6 at 1100

- Arrived onsite at Moscow PD well 1230.

Battery: 96% Time: 1 min fast; not reset

WL: 55.7492 DTW: 76.62 ft.

SN: 2131185 LLS

- Arrived onsite at Bond well 1245.

Battery: 96% Time: 1 min slow; not reset.

SN: 2128360 LLS. WL: 50.0449 ft at 1200

DTW: 63.64 ft.

- Arrived on site at cemetery well 1300.

Battery: 100% Time: 12 min fast; ~~not~~ reset due to memory

WL: 49.2580 at 1300 SN: 2049395 (KD) LL Edge

DTW: 104.99 ft

Returned by 1320. Said goodbye to Andrew until next year.

- Arrived onsite at Elliott well at 1400.

Weather: 60° mostly Sunny ATM: 1014.6 at 1400

Logger removed from well 1415; SN: 2124081 LL Edge

Battery: 100% Time: 7 min slow; not reset

DTW: 79.92 ft at 1430 WL: 52.1867 at 1400.

Pump did not run while on site.

→ DTW 2: 79.88 at 1435; Recharging slowly.

DTW 3: 79.78 at 1445; Recharging slowly

Lowered logger ≈ 20 ft down well casing (measured using wingspan) given it is high and dry at some points during the pumping cycle etc., during monitoring. Returned by 1445.

- Arrived at Brandt well 1500.

SN: 1064657 LL Gold; replacing today due to age.

Battery: 99% Time: 2 min fast; replaced w/ SN: 2161950 LLS

DTW: 145.35 ft to Top of inner PVC casing; 145.33 at 1350

DTW: 147.54 ft to Top of outside casing; 147.52 at 1350.

WL: 30.0846 at 1500.

Pump did not run while on site; recharging slowly using e-tape
A installed new LLS logger ≈ 30 ft exactly below the WL.

Could not get poly rope back down inner casing...
Replaced using 40 lb fishing line instead of poly rope.

KD PBAC 2022 9/22/2022

• Arrived at IDWR 4 at 1615.

Weather: 63° mostly cloudy ATM: 1014.4 mb at 1600

Replacing existing logger SN: 1064666 Stopped → Spare #4

w/ new LLS solinst SN: 2161958

using existing poly rope and ^{new} connector; shortened ≈ ~~3~~ 1 foot or so

DTW: 390.92 ft.

WL: 29.7742 at 1600.

(KD) tied a climbing knot.