

File: 2501141

July 14, 2025

Barbara Johnstone and Aaron Grimmer
Pender Island BC

Attention: Barbara Johnstone and Aaron Grimmer

Re: Installation of Groundwater Monitoring Well at Concrete Plant, 4415 Bedwell Harbour Road, Pender Island

As requested, Hy-Geo Consulting has prepared the following report on the recent installation of a groundwater monitoring well located down gradient from the concrete batch plant. The installation of a monitoring well was a requirement for property under the Temporary Use Permit, NP-TUP-2023.5 (Grimmer) issued by the North Pender Island Local Trust Committee (2023).

Site Location

The monitoring well was constructed on June 30, 2025 on a portion of Lot 1, Section 18, Pender Island, Cowichan District, Plan VIP59806 (PID: 018-948-421) as shown in Figure 1. The location and proposed depth of the well was previously discussed with Brad Smith, Islands Trust Planner on January 29, 2025.

Monitor Well Construction

The monitoring well was constructed by Gulf Excavating Ltd., to a depth of 15 feet (4.6 m) utilizing an excavator (Photo 1, Appendix A). The excavation encountered 1 foot of organic topsoil underlain by 2 feet of buff stiff clay followed by 12 feet of grey clay and shale (Photos 2 and 3, Appendix A). Groundwater was observed below a depth of 11 feet (3.4 m) on some of the fracture surfaces in the shale. After completing the excavation to a depth of 15 feet (4.6 m), a 20 foot (6.1 m) length of 6 inch diameter PVC thermoplastic casing with the bottom 5 feet (1.5 m) slotted was set in the excavation (Photo 4, Appendix A). Water as observed coming at the bottom of the excavation (Photo 5, Appendix A). Clean gravel with sand (Photo 6, Appendix A), was backfilled around the slotted portion of the casing to within 8 feet of the ground surface and the remainder of the excavation was initially filled in with the excavated materials to within 3.5 feet (1.1 m) of the ground surface. A temporary 8 inch diameter surface casing 4 feet (1.2 m) in length was then set over the 6 inch diameter well casing and the annular space between the casings filled with medium-sized bentonite pellets (Photo 7, Appendix A). The area around the 8 inch diameter casing was

then backfilled in stages with more of the excavated materials while the 8 inch diameter casing was being pulled back until the excavation was completely filled leaving the monitor well casing sticking up 25 inches above the ground surface. Figure 2 shows the design of the monitor well as completed prior to pulling the temporary surface casing. Photo 8, Appendix A, shows the temporary surface casing being removed and Photo 9, Appendix A shows the completed monitor well with 25 inch stick-up.

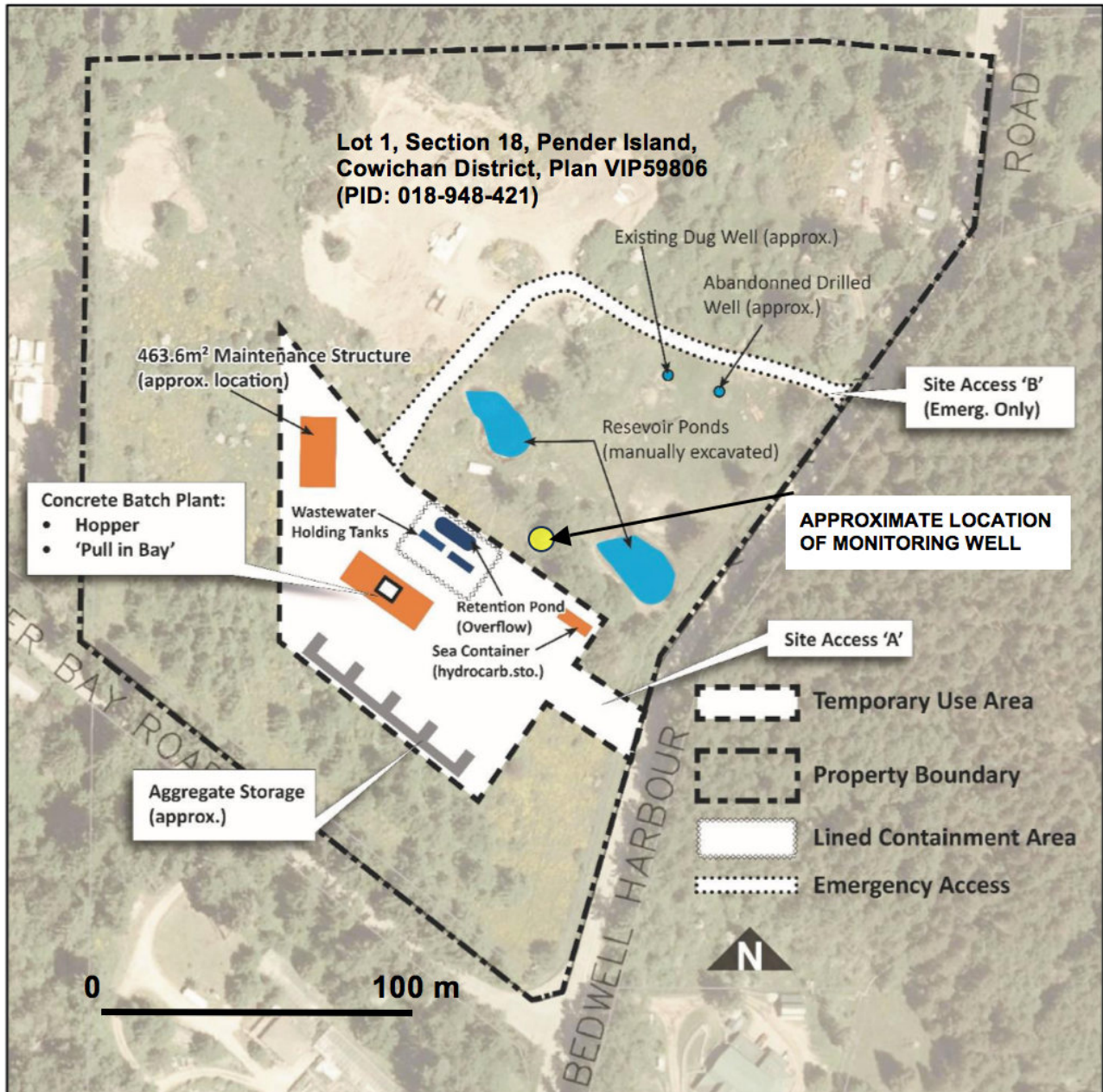


Figure 1. Approximate location of monitoring well constructed on June 30, 2025. Basemap from North Pender Island Local Trust Committee (2023).

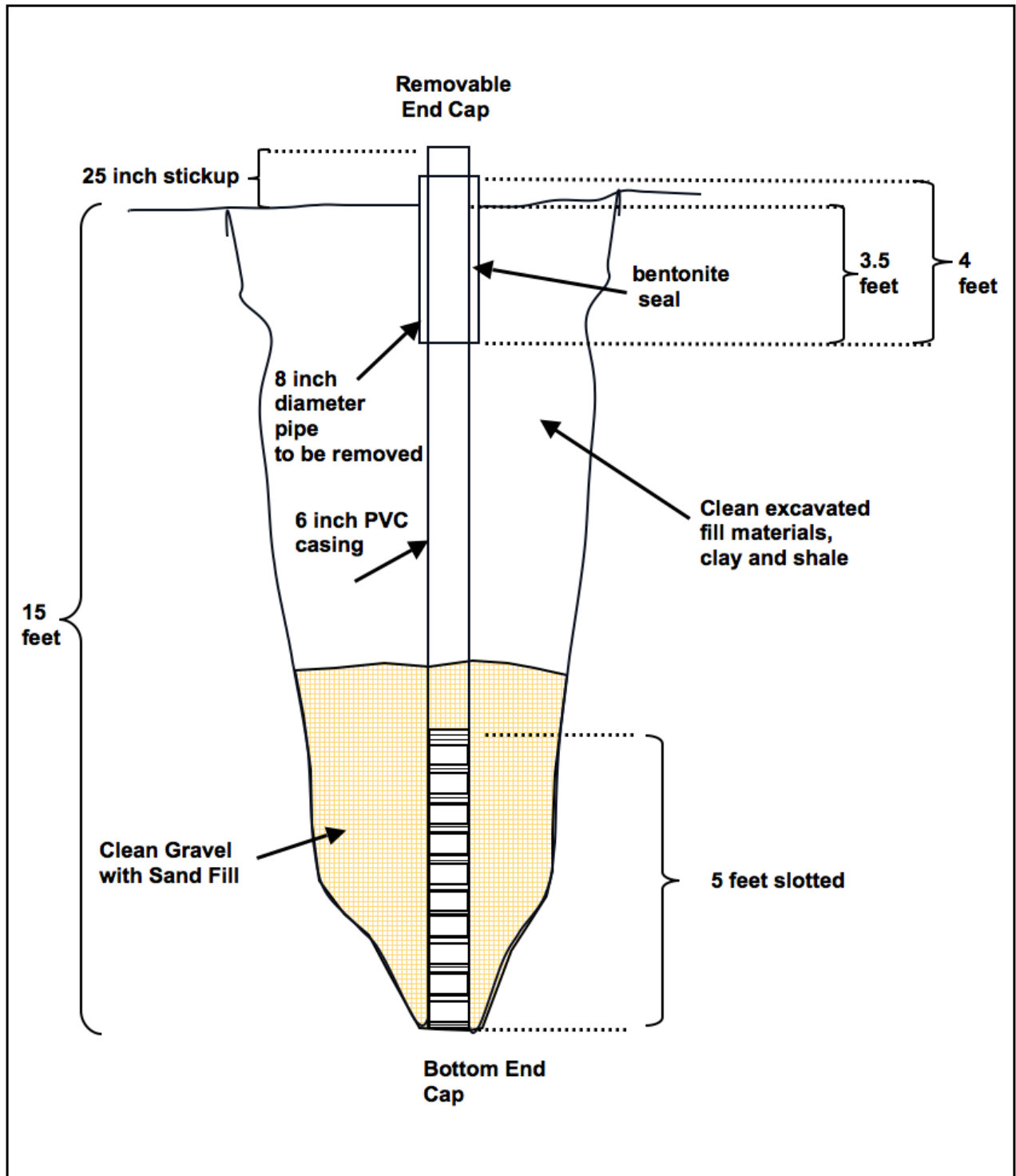


Figure 2. Schematic of monitor well installation, not to scale.

Conclusions

Based on the above, the following relevant conclusions can be made:

1. A 6 inch diameter PVC monitor well was successfully completed on June 30, 2025 to a depth of 15 feet, down gradient from the concrete batch plant as required under the Temporary Use Permit, NP-TUP-2023.5 (Grimmer) issued by the North Pender Island Local Trust Committee (2023).
2. The excavation encountered 1 foot of organic topsoil underlain by 2 feet of buff stiff clay followed by 12 feet of grey clay and shale.
3. Groundwater was observed along fractures and bedding planes within the clay and shale materials encountered at the site below a depth of 11 feet (3.4 m) and groundwater was present in the excavation when the well casing was installed.
4. The monitor well was constructed by excavation and completed in accordance with requirements under the *Groundwater Protection Regulation* (Province of British Columbia, 2025), including Section 20 Casings and liners, Section 22 Surface seal, Section 33 Casing stick-up, Section 35 Slope of surface of ground around wellhead, Section 38 Well caps, and Section 77 Well construction reports submitted to well owner only. A copy of the well construction report is provided in Appendix B.

Recommendations

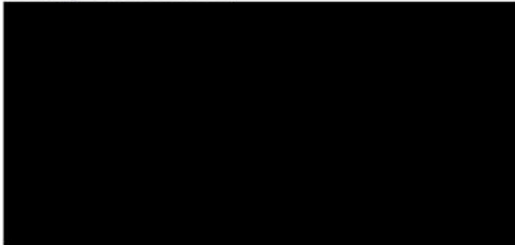
The following recommendations are provided for implementation.

1. As the monitor well was completed with PVC thermoplastic casing it would be important to protect the casing from future damage by installing a larger diameter steel casing with a lockable well cap over the plastic casing. This would be in compliance with Section 34 Protection of thermoplastic casings under the *Groundwater Protection Regulation*. Care should be taken not to excavate the bentonite seal around the plastic casing when installing the steel casing. The stick-up of the plastic casing could also be reduced to 12 inches if necessary.
2. Prior to any groundwater sampling of the monitor well it would be prudent to bail several well volumes from the well before sampling.

Closure

This report was prepared in accordance with generally accepted engineering, hydrogeological and consulting practices. It is intended for the prime use of Barbara Johnstone and Aaron Grimmer in connection with its purpose as outlined under the scope of work for this project. This report is based on data and information available to the author from various sources at the time of its preparation and the findings of this report may therefore be subject to revision. Data and information supplied by others has not been independently confirmed or verified to be correct or accurate in all cases. Any errors, omissions or issues requiring clarification should be brought to the attention of the author. The author retains full copyright of the material contained in this report. The author and Hy-Geo Consulting accepts no responsibility for damages suffered by any third party as a result of any unauthorized use of this report.

Respectfully submitted,



Alan P. Kohut PEng.
Principal and Senior Hydrogeologist

HY-GEO CONSULTING
Permit to Practice Number: 1001034

References

North Pender Island Local Trust Committee. 2023. *Temporary Use Permit, NP-TUP-2023-5 (Grimmer), 4415 Bedwell Harbour Road.*

Province of British Columbia. 2025. *Groundwater Protection Regulation, Water Sustainability Act.* Consolidated to November 29, 2022. Internet website https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/39_2016

Appendix A

Photographs taken June 30, 2025.



Photo 1. Excavator employed to install monitor well, June 30, 2025.

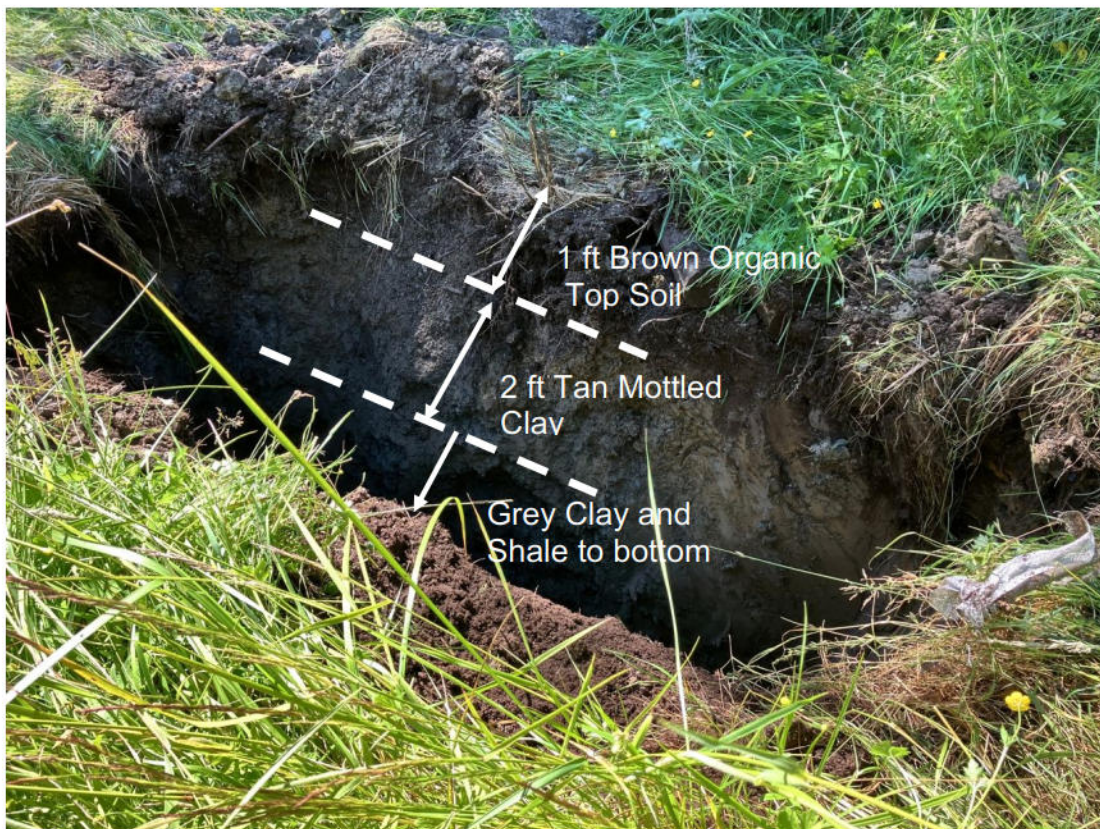


Photo 2. Exposed upper portion of soils in excavation for monitor well, June 30, 2025.



Photo 3. Excavated material comprised of soft grey clay and alternating harder layers of grey mudstone and shale, June 30, 2025.



Photo 4. 6 inch diameter PVC well casing set in excavation to depth of 15 feet (4.6 m), June 30, 2025. Casing was subsequently cut to provide a 25 inch (63.5 cm) stick up above ground level.



Photo 5. Monitor well casing set in excavation. Note water in bottom of excavation, June 30, 2025.



Photo 6. Gravel with sand material for backfill around slotted section of well casing, June 30, 2025.



Photo 7. Pouring bentonite pellets between 6 inch diameter well casing and temporary 8 inch diameter surface casing, June 30, 2025.



Photo 8. Pulling out 8 inch temporary surface casing, June 30, 2025.



Photo 9. Completed 6 inch diameter monitoring well, June 30, 2025.

Appendix B

Well Construction Report

