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**Tritium in Groundwater Monitoring at  
Pilgrim Nuclear Power Station, Plymouth, MA  
July- December 2021**

This report provides data from the ongoing monitoring of tritium in groundwater and surface water at the Pilgrim Nuclear Power Station (PNPS) located in Plymouth, MA. The history of the investigation, which began in 2010, and previous update reports, are available online<sup>1</sup>.

**Summary**

- Monitoring results for July-December 2021 indicate that tritium levels do not present a health risk.
- No detectable tritium was measured in either surface water samples or in 15 of 23 routinely sampled groundwater wells. Tritium levels in the other wells were detectable and were generally stable or tended to decrease over time.
- All measured levels of tritium in groundwater are less than the US EPA drinking water standard for tritium of 20,000 picocuries per liter (pCi/L).

**Background**

Holtec collects samples at 23 groundwater wells and one surface water location on-site at PNPS. The sampling intervals for the last six months of 2021 were either monthly or quarterly, depending on past monitoring results and analysis of possible tritium pathways in groundwater. Well and surface water samples were sent to an independent analytical lab, Teledyne, with duplicate (or “split”) samples provided to the Massachusetts Department of Public Health (DPH) for analysis at the Massachusetts Environmental Radiation Lab (MERL). Holtec regularly reports the Teledyne results to DPH, the Massachusetts Emergency Management Agency (MEMA), and the Nuclear Regulatory Commission (NRC). Summaries of both laboratory results are then provided on the DPH website<sup>2</sup>.

<sup>1</sup> Previous PNPS Tritium in Groundwater Investigation Updates are available here:

<https://www.mass.gov/lists/environmental-monitoring-data-for-tritium-in-groundwater-at-pilgrim-nuclear-power-station>

Results are compared to a conservative, health-protective screening level of 3,000 pCi/L, or 1/10<sup>th</sup> the NRC-approved level of 30,000 pCi/L of tritium in non-drinking water sources, as well as to the US Environmental Protection Agency (EPA) drinking water standard for tritium of 20,000 pCi/L. As the closest municipal drinking water wells are 2.5 miles from PNPS, municipal water is not expected to be impacted by the tritium on-site at PNPS.

## Results and Discussion

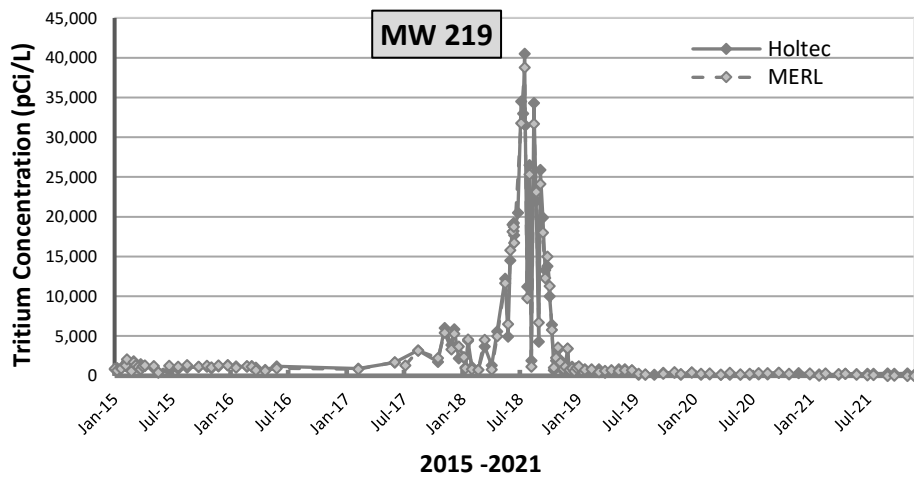
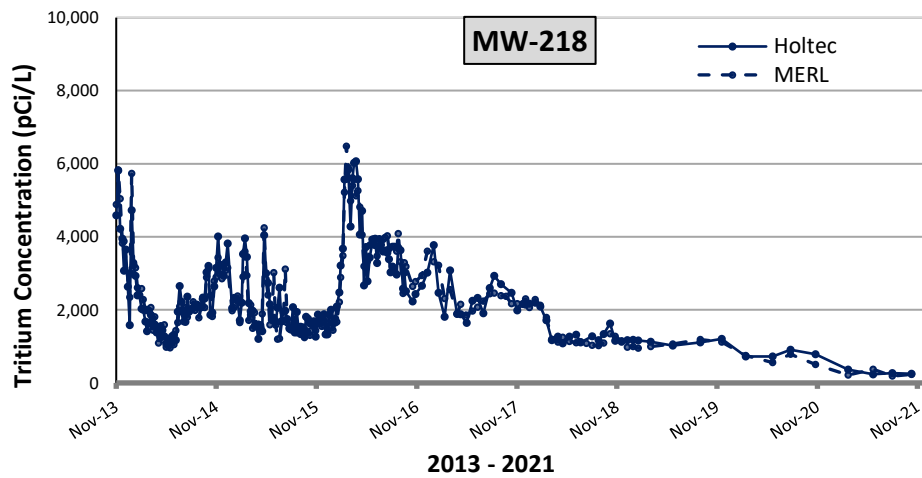
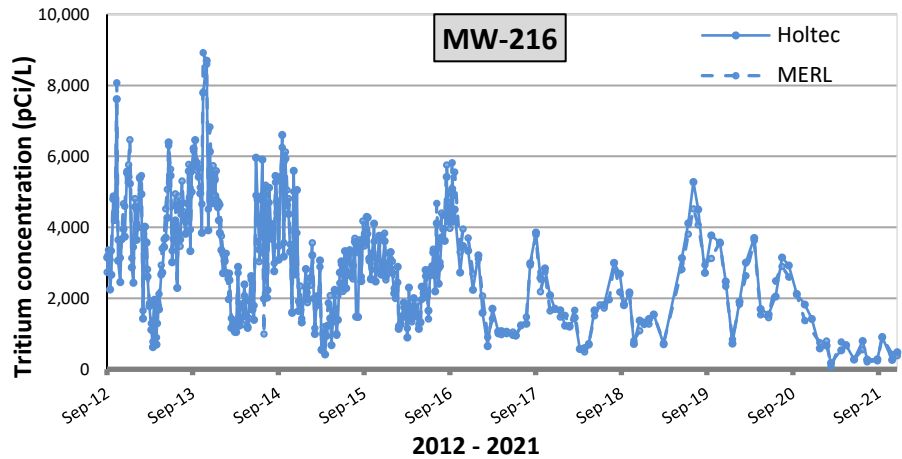
Groundwater monitoring results for the last six months of 2021 showed stabilization or a reduction in tritium levels at most wells; there was no detectable tritium activity in surface water samples or in 15 of the 23 on-site groundwater wells that are routinely monitored<sup>2</sup>.

- Figure 1 shows sampling results for MW-216, MW-218, and MW-219, where tritium levels have historically exceeded the screening level of 3,000 pCi/L. For the last six months of 2021, tritium levels at MW-216 remained less than 1,000 pCi/L, while tritium levels at MW-218 and MW-219 were below detection limit.
- Tritium levels in MW-209, MW-211, and MW-215, where levels have previously exceeded 3,000 pCi/L, were either less than 500 pCi/L (MW-211) or below detection limits (MW-209, MW-215) for the last six months of 2021.
- Tritium levels in the other six wells where tritium was detected (MW-202I, MW-204, MW-205, MW-207, MW-208S, and MW-3) were less than 500 pCi/L for the last six months of 2021.

None of the tritium levels measured in groundwater wells at PNPS for the last six months of 2021 present a health risk.

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<sup>2</sup> Summary tables of groundwater and surface water monitoring results are on the DPH website:  
<https://www.mass.gov/lists/environmental-monitoring-data-for-tritium-in-groundwater-at-pilgrim-nuclear-power-station#summaries---results->



**Figure 1.** Results for tritium in groundwater samples collected from Pilgrim Nuclear Power Station (PNPS), at monitoring wells where tritium levels have historically exceeded 3,000 pCi/L. Data are plotted separately based on PNPS operator (solid lines) or DPH (dotted lines) produced results. Values below detection limit (DL) plotted as DL/2.

Posted: April 2022