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Summary of Historical Weldon Spring Area Private Drinking Water Well Sampling September 2024

The Missouri Department of Health and Senior Services (DHSS) sampled private drinking water wells between the years 1982 and 2011 in the vicinity of the former Weldon Spring Chemical Plant and Quarry in St. Charles County, Missouri. Due to recent community concerns in the area, DHSS performed a search of our historical private well records and created this summary of the data found, which included over 70 wells with radiological data.

This historical sampling was offered to residents to inform them of their water quality and was not done specifically due to concerns about the site. Areas sampled are in the vicinity of the site but are also in an area where naturally-occurring radioactive material (NORM) occurs in certain geological features and bedrock aquifers. This has been documented by the U.S. Geological Survey, (<https://www.usgs.gov/mission-areas/water-resources/science/radionuclides#overview>; <https://pubs.usgs.gov/publication/cir1360>).

Limited sampling began in 1982 and expanded over the years. Some wells were sampled once, while others were sampled repeatedly and placed on a recurrent sampling schedule that varied between quarterly, semi-annually, or annually. Sampling access, frequency, and duration depended on sample results and the well owner's interest in additional sampling.

DHSS analyzed water samples for minerals, nutrients, and metals, volatile organic compounds, and radiological parameters which included one or more of the following: gross alpha/beta, Radium-226 (Ra-226), Radium-228 (Ra-228), Uranium, Thorium-230 (Th-230), and Thorium-232 (Th-232).

Sample results were compared to U.S. Environmental Protection Agency (EPA) Maximum Contaminant Levels (MCLs). MCLs are standards set to protect public health. These drinking water standards were developed by EPA to regulate public drinking water. Even though private water is not regulated, DHSS uses these same standards when interpreting laboratory results and making health-based recommendations. Concentrations at or below these comparison values are unlikely to cause adverse health effects and can reasonably be considered safe. MCLs have changed over time and DHSS re-screened the results based on updated MCLs. Of the wells, a total of 9 were found to have radiological parameter(s) detected above current MCLs – see the attached map. These detections have not been attributed to the Weldon Spring Site and are likely from NORM, which is known to occur in this region. The following table is a summary of this data.

PROMOTING HEALTH AND SAFETY

The Missouri Department of Health and Senior Services' vision is optimal health and safety for all Missourians, in all communities, for life.

Results of DHSS Private Well Testing, 1982-2011

	Alpha	Combined Radium (Ra-226 + Ra-228)
# of wells above MCL ¹	7	7

1. The MCL for alpha particles is 15 picoCuries per Liter (pCi/L) which includes thorium and the MCL for combined radium is 5 pCi/L. The total number of wells with radiological parameters detected above MCLs during their sampling history is nine (9): five (5) wells with a combination of both Alpha and Radium detected above MCLs; two (2) additional wells with detections only of Alpha above the MCL; and two (2) additional wells with detections only of Radium above the MCL.

At the time of the sampling, for every water sample collected, DHSS followed up with a letter to the well owner providing the results and advised the owner of potential health concerns when identified. If the well water exceeded MCLs, DHSS recommended treatment of their drinking water. To reduce activity of radionuclides in wells, a properly maintained water softener or reverse osmosis system were commonly recommended. DHSS also tested the treated water to determine if home water treatment systems adequately reduced concentrations to below MCLs. If the treatment systems were properly maintained, the levels of radiological contaminants sampled were effectively reduced to below MCLs.

In addition to the sampling performed by DHSS, private well sampling was also conducted by the U.S. Army Corps of Engineers. This sampling was part of the Weldon Spring Ordnance Works Remedial Investigation. Analytes sampled include several nitroaromatics (commonly used as explosives and propellants) and metals. Additional documentation and data for nitroaromatics and metals is available within the document *Remedial Investigation for the Groundwater Operable Unit (GWOU) at the Chemical Plant Area and the Ordnance Works Area, Weldon Spring, Missouri*, 1997 at: https://lmpublicsearch.lm.doe.gov/lmsites/3608-gwar_21548_571_jul_1997.pdf.

DHSS created this summary to help address community concerns regarding drinking water in the St. Charles County area. Findings from the historical private well sampling conducted by DHSS include:

- **The results from this sampling do not link contamination of private wells to the Weldon Spring Site.**
- **The radionuclide detections in private wells are likely from NORM which is known to occur in this region.**

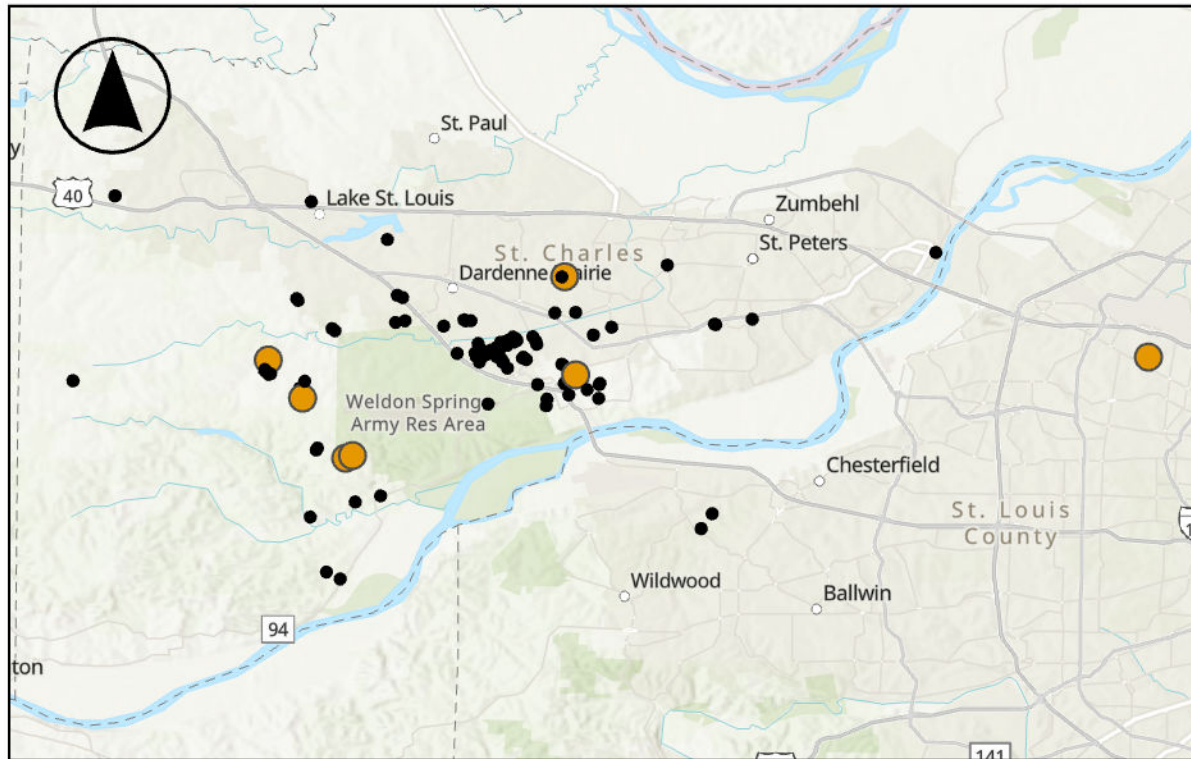
If after reading this summary, you still have concerns about radionuclides in your private well water, consider having your private well tested. If interested in testing, please be aware of the following:

- The St. Louis County Environmental Health Laboratories offers testing of radionuclides in private wells for a fee (<https://stlouiscountymo.gov/st-louis-county-departments/public-health/environmental-services/environmental-laboratories/water-testing/>). Additionally, there is a listing of certified laboratories available from the Missouri Department of Natural Resources (DNR, <https://dnr.mo.gov/water/business-industry-other-entities/certified-laboratories>) and some of these may also offer testing for radionuclides.
- If testing confirms radionuclides in your drinking water, there are varying water treatment options that can reduce the levels of specific chemicals and radionuclides in drinking water

- the National Sanitation Foundation (NSF) tests and certifies water treatment systems for specific reductions (<https://www.nsf.org/consumer-resources/drinking-water/water-treatment-systems>, <https://info.nsf.org/certified/dwtu/>).
- Households equipped with a functioning water treatment system such as a water softener or reverse osmosis are likely already reducing the level in their water as long as they properly maintain their water treatment system.

For public water systems, all public water supplies are tested regularly for radionuclides (<https://www.epa.gov/dwreginfo/radionuclides-rule#rule-summary>). DNR's Public Drinking Water Branch is responsible for ensuring Missouri's public water systems follow state and federal rules and regulations and provide safe drinking water to all Missouri citizens and visitors. These individual water systems are required to monitor the quality of water they supply to verify that it meets all federal and state standards. How often and where samples are taken varies by system and contaminant. You can find the most recent test results for your public water system at DNR's Drinking Water Watch website (<https://www.dnr.mo.gov/DWW/DNRLogin.jsp.jsp>). DNR also provides access to annual Consumer Confidence Reports for community water supplies on their website. If you have questions regarding the overall quality of your community water, visit <https://dnr.mo.gov/water/how-water-water-we-drink/drinking-reports/consumer-confidence>.

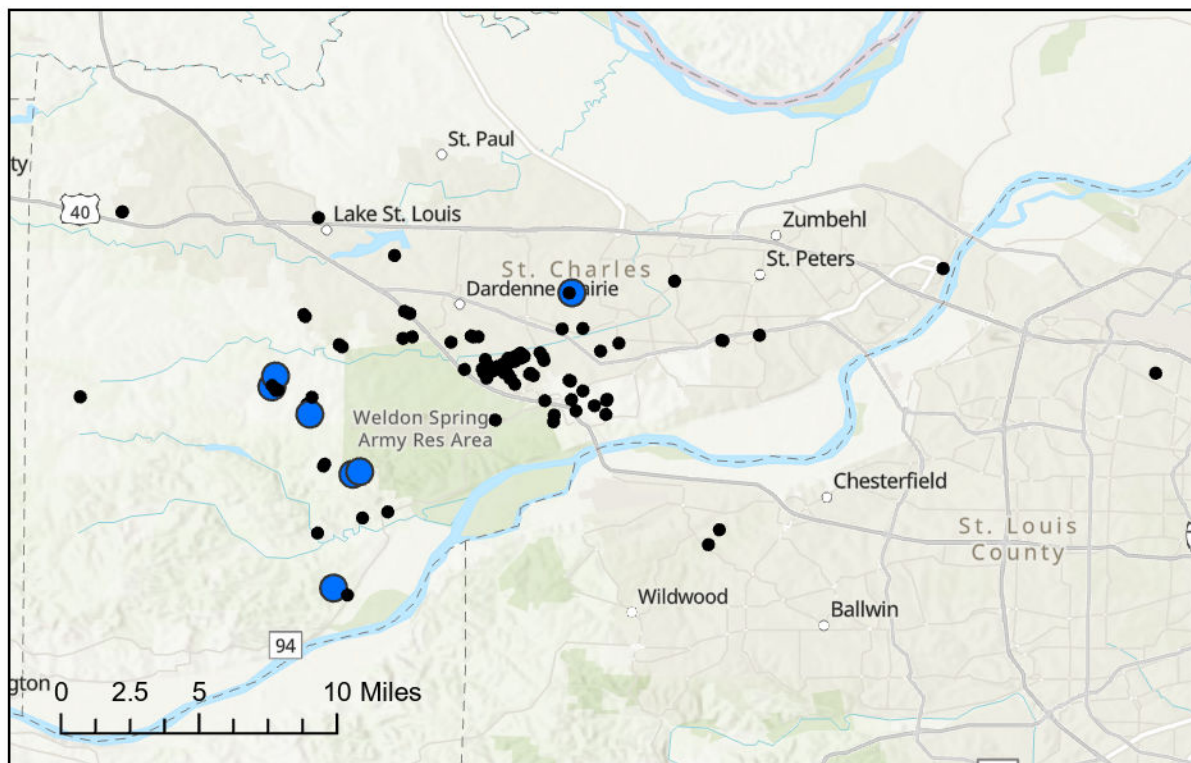
Private Well Radionuclide Concentrations around Weldon Spring



Alpha

- Less than MCL or non-detect
- Greater than or equal to MCL

The Maximum Contaminant Limit (MCL) for alpha radionuclides in water is 15 picocuries per liter (15 pCi/L).



Radium 226 + 228

- Less than MCL or non-detect
- Greater than or equal to MCL

The Maximum Contaminant Limit (MCL) for Radium 226 + 228 radionuclides in water is 5 picocuries per liter (5 pCi/L).