



PFAS Study in North Pole Area Water

March 2019, Revised November 2019

The finding of PFAS, or per- and polyfluoroalkyl substances, in drinking water has drawn attention nationwide, statewide and locally in the Fairbanks area. In Alaska, PFAS in the environment are often linked to the use of certain foams used in firefighting or fire training activities.

PFAS are man-made chemicals used in industry and consumer products worldwide since the 1950s. These chemicals resist heat, oil, water, and stains. They are used in firefighting foams and in many everyday products such as non-stick cookware and water- and stain-repellent fabrics. PFAS do not easily break down in the environment, and they can spread readily in groundwater. Concerns have emerged about possible health impacts of PFAS, and further studies are needed.

In April 9, 2019, the Alaska Department of Environmental Conservation (DEC) published a revised technical memorandum on action levels for PFAS that aligns the DEC action levels with EPA's Lifetime Health Advisory levels. DEC's action level for the sum of two PFAS, PFOS and PFOA, is 70 parts per trillion (ppt). DEC's technical memorandum was most recently updated in October 2019 to address sampling and reporting requirements.

For more information on PFAS, DEC's action levels and EPA's PFAS Action Plan, please visit DEC's website: <https://dec.alaska.gov/spar/csp/pfas/>

PFAS Sampling

In summer 2018, DEC used the existing sulfolane monitoring program to sample North Pole groundwater for PFAS. DEC tested a small number of water supply wells and monitoring wells for PFAS.

DEC collected additional well samples and surface water samples from Kimberly Lake and Badger Slough in late fall/early winter 2018. Hydrologists chose the test locations to look for PFAS across a wide range of groundwater and surface water conditions over an approximate six square mile area in the direction of groundwater flow north and northwest of the former North Pole Refinery.

DEC is aware that fire-fighting foams containing PFAS were used in the past on the former refinery property. The goal of the 2018 monitoring was to look for PFAS off the refinery. PFAS is not related to sulfolane, except that both chemicals were used on the former refinery.

People in the area have already been provided alternate drinking water supplies or point of entry (POE) water treatment systems for sulfolane

Drinking Water Well Results

POE water treatment systems (used for sulfolane removal) are removing PFAS to below DEC action levels. In fact, PFOS and PFOA were not detected in treated drinking water.

removal. The City's piped public water system is expanding throughout the impacted area, and the area expected to be impacted in the future. Some properties have already been hooked up to the expanded piped water system, with additional eligible properties able to connect by mid-2020.

For the PFAS sampling DEC selected:

- **35 water supply wells, 20 of which had POE treatment systems, and**
- **42 groundwater monitoring wells.**

From each well with a POE treatment system, DEC took two samples: one untreated and the other after

treatment. DEC took one sample from each of the other wells.

Drinking Water Well Results

PFOS and PFOA were not detected in any treated drinking water sample.

POE water treatment systems, used for sulfolane removal, are effectively removing PFAS to below DEC action levels.

Untreated Water Results

Groundwater migrating off the former North Pole Refinery has been impacted by PFAS.

- On the former refinery property, PFOS+PFOA exceed DEC's action level. The onsite PFAS sampling was performed and reported by FHR contractors in 2018.
- Off the former refinery property,
 - PFOS+PFOA were below the DEC action level except in one monitoring well located outside of the sulfolane plume, as described below.
 - In addition to PFOS and PFOA, the following PFAS were detected in at least 75% of the sample locations: PFNA (83%), PFHxS (100%), PFHpA (77%), PFBS (89%), and PFHxA (75%).
 - Of the PFAS detected, PFNA had the highest concentration at 57 ppt.
- In one monitoring well located outside of the sulfolane plume, PFOS+PFOA were detected above the action level. This PFAS contamination is not believed to have migrated from the former refinery. Further investigation of potential sources of PFAS in that area are currently underway.

Surface Water Results

- PFAS are present in the water sample from Kimberly Lake. PFOS+PFOA were detected at a concentration of 41 ppt. PFNA was detected at a concentration of 50 ppt. Kimberly Lake is located to the northwest of the former North Pole Refinery, in the direction of the groundwater flow.
- PFAS are present at low levels in samples collected from Badger Slough at the Repp Road, Plack Road, and Hurst Road culverts.

Fish Sample Results

- The discovery of PFAS in Kimberly Lake led to the sampling of Kimberly Lake fish. In December 2018, Alaska Department of Fish and Game (ADF&G) sampled three rainbow trout from Kimberly Lake and analyzed them for PFAS.
- Both PFOS and PFNA were measured at levels of concern in all three fish from Kimberly Lake. In fish tissue, PFNA ranged from 16 to 22 parts per billion (ppb) and PFOS ranged from 47 to 68 ppb. These concentrations are orders of magnitude above the concentrations in surface water.
- **In April 2019, ADF&G closed Kimberly Lake to sport fishing and will not continue to stock the lake.**

Next Steps

- DEC is working with parties responsible for the contamination to further define the PFAS plume off the former North Pole Refinery property.
- Possible other sources of PFAS in the area are being explored.

Contacts

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To learn more, visit:

DEC - Former NPR website:

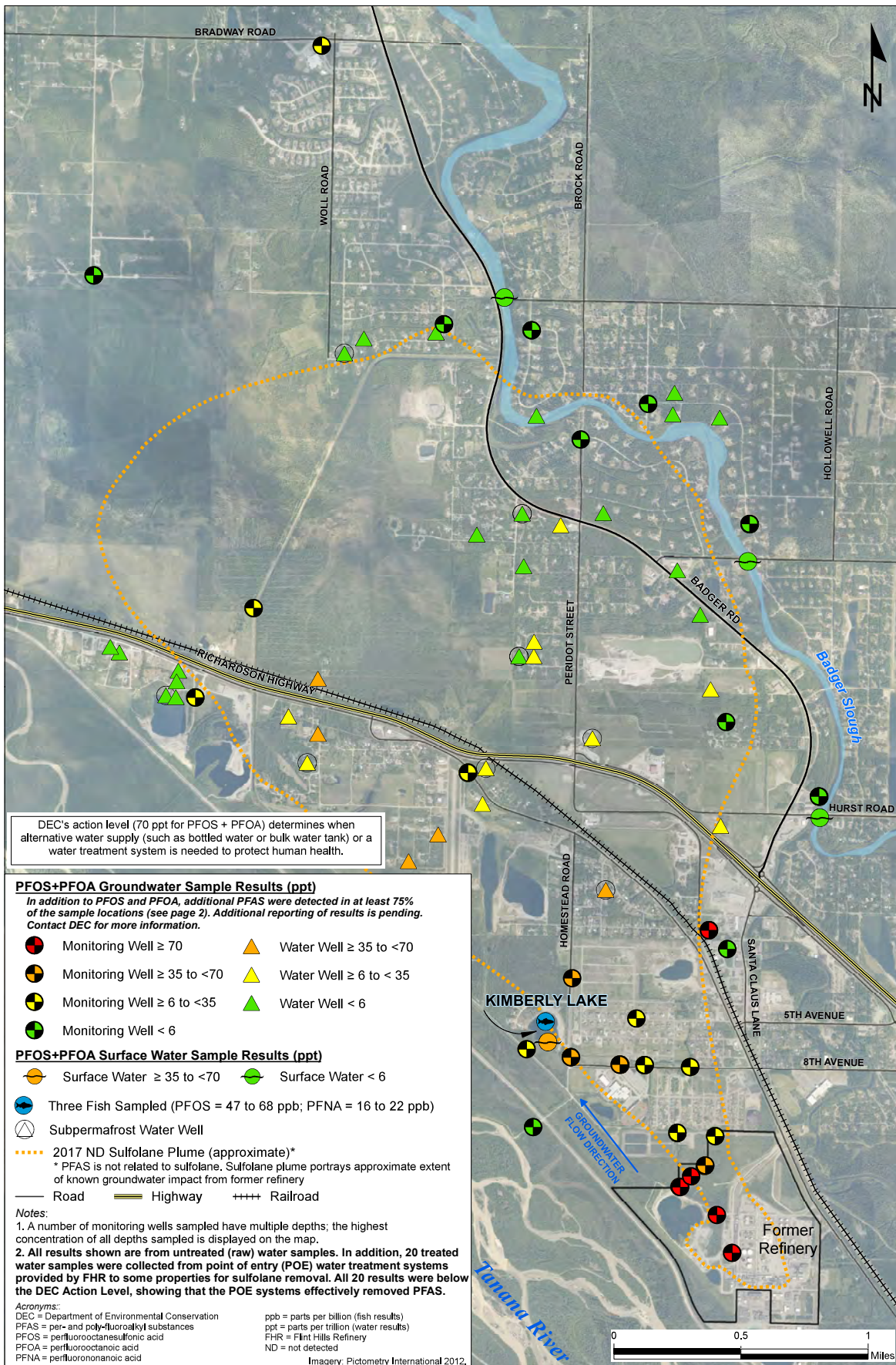
dec.alaska.gov/spar/csp/sites/north-pole-refinery

DEC PFAS website:

dec.alaska.gov/spar/csp/pfas

DHSS PFAS website:

dhss.alaska.gov/dph/Epi/eph/Pages/PFAS.aspx



2018 PFAS Monitoring Results North Pole, Alaska

