State of California
California Regional Water Quality Control Board
Santa Ana Region

December 2, 2022

STAFF SUMMARY REPORT

ITEM: 14

SUBJECT: Updates on the Recent PFAS Regulatory Standards and Investigations in the Santa Ana Region

BACKGROUND:

Per- and polyfluoroalkyl substances (PFAS) are a large group of human-made substances that do not occur naturally in the environment and are resistant to heat, water, and oil. PFAS have been used worldwide in the production of a wide range of industrial and household products since the 1940s. There are thousands of different PFAS, some of which have been more widely used and studied than others. Perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) are two of the most widely used and studied chemicals in the PFAS group. PFOS and PFOA have been replaced in the United States with other PFAS in recent years. After decades of widespread use, PFAS chemicals came under scrutiny for suspected human health risks.

PFAS are found in many products, such as: non-stick cookware and other non-stick products (e.g., Teflon™); food packaging materials; waterproof and water repellant textiles; water repellant furniture coating; carpet (stain repellants); polishes; waxes; paints; cleaning products; medical garments; dental floss; and firefighting foams (aqueous film-forming foams or AFFF). PFAS are used in the aerospace, automotive, chemical manufacturing, electronics, metal coatings and plating, and textile industries, due to their friction-reducing characteristics. Potential firefighting sources of PFAS include airports and aviation facilities, military bases and training centers, petroleum refineries and terminals, and petrochemical production facilities. Non-industrial PFAS sources include waste disposal facilities, wastewater treatment plants, and biosolids application to agricultural lands.

People can be exposed to PFAS in a variety of ways, including consuming contaminated water or food, breathing contaminated air or household dust, and using products made or treated with PFAS, or that are packaged in materials containing PFAS. Because of their widespread use and persistence in the environment, scientists have found PFOS and PFOA in the blood of nearly all people tested globally.

PFAS can accumulate within aquatic animals and human bodies over time and are toxic at low concentrations. Based on the currently available peer-reviewed studies on laboratory animals and epidemiological evidence in human populations, the U.S. EPA concluded that exposure to PFOS and PFOA may result in adverse health effects, including developmental effects on fetuses during pregnancy (e.g., low birth weight) or

to breastfed infants (e.g., accelerated puberty, skeletal variations), cancer (e.g., testicular, kidney), liver effects (e.g., tissue damage), immune system effects (e.g., reduced immunity response and antibody production), thyroid effects and other effects (e.g., cholesterol changes).

Development of Regulatory Levels for PFAS

The following is a list of milestones in the development of regulatory levels for PFAS:

- In May 2016, the United States Environmental Protection Agency (U.S. EPA) issued a lifetime health advisory (LHA)[1] for PFOA and PFOS in drinking water, advising municipalities that they should notify their customers of the presence of PFAS over LHA levels in community water supplies. The LHA level was established at 70 nanograms per liter (or parts per trillion [ppt]) for PFOA and PFOS individually or combined.
- In June 2018, the California Office of Environmental Health Hazard Assessment (OEHHA)[2] recommended interim notification levels for PFOA in drinking water (based on liver toxicity, as well as cancer risks) and for PFOS (based on immunotoxicity). OEHHA made these recommendations following review of currently available health-based advisories and standards and supporting documentation.
- In July 2018, after independent review of the available information on the risks, the California State Water Resources Control Board (State Water Board) - Division of Drinking Water (DDW) established interim Notification Levels[3] of 13 ppt and 14 ppt for PFOS and PFOA, respectively, in drinking water. Based on the adopted notification levels, DDW established an interim Response Level[4] of 70 ppt for the total combined concentration of PFOA and PFOS, consistent with the U.S. EPA's health advisory level established in 2016.

[1] The LHA is the level, or amount, calculated to offer a margin of protection against adverse health effects to the most sensitive populations.

[2] The Office of Environmental Health Hazard Assessment (OEHHA) is the lead state agency for the assessment of health risks posed by environmental contaminants. OEHHA's mission is to protect and enhance the health of Californians and our state's environment through scientific evaluations that inform, support, and guide regulatory and other actions.

[3] Notification Levels are health-based advisory levels established by the DDW for chemicals in drinking water that lack maximum contaminant levels (MCLs). When chemicals are found at concentrations greater than their notification levels, certain requirements and recommendations apply. If a chemical concentration is greater than its notification level in drinking water that is provided to consumers, DDW recommends that the utility inform its customers and consumers about the presence of the chemical, and about health concerns associated with exposure to it. To provide consumer notice, the utility may want to consider using its annual Consumer Confidence Report, a separate mailing, or other method.

[4] Response Levels are concentrations at which DDW recommends removal of a drinking water source from service.

- In August 2019, the State Water Board lowered the notification levels to 6.5 ppt for PFOS and 5.1 ppt for PFOA in drinking water based on the recommendations by OEHHA.
- In November 2019, OEHHA held a webinar to allow the public to hear and ask questions about the toxicological and epidemiological data for evaluating PFOA and PFOS, in connection with its initiation of the development of Public Health Goals (PHGs)[5] for PFOA and PFOS in drinking water.
- In February 2020, the State Water Board lowered the response levels to 10 ppt for PFOA and 40 ppt for PFOS in response to new data concerning PFAS toxicity.
- In March 2021, DDW issued notification and response levels for perfluorobutane sulfonic acid (PFBS) of 500 ppt and 5,000 ppt, respectively.
- In June 2022. U.S. EPA established interim updated LHA for PFOS and PFOA at 0.004 and 0.02 ppt, respectively. U.S. EPA also established final lifetime health advisories for PFBS and hexafluoropropylrnr oxide (HFPO) dimer acid and its ammonium salt (referred to as GenX chemicals) at 2,000 ppt and 10 ppt, respectively.
- In October 2022, DDW issued notification and response levels for perfluorohexane sulfonic acid (PFHxS) of 3 ppt and 20 ppt, respectively.
- Currently, OEHHA is evaluating the available data to provide PHGs for PFOS and PFOA.

PFAS Occurrence and Source Investigations

Given the extent to which PFAS has and continues to impact drinking water supplies in California, both the State Water Board and the Santa Ana Regional Water Quality Control Board (Santa Ana Water Board) have initiated investigations to determine the magnitude, extent, and potential sources of PFAS contamination.

- The Santa Ana Water Board started regional oversight of PFAS investigations at municipal landfills and Department of Defense (DoD) sites during the 2015 - 2016 timeframe.
- In March 2019, the State Water Board initiated a statewide phased approach for PFAS source investigation at 28 airports and 196 landfills and adjacent public drinking water supply wells. During the same time period, and concurrent with the State Water Board's phased approach, the Santa Ana Water Board issued PFAS Investigative Orders to three airports within the region: John Wayne Airport, Ontario International Airport, and San Bernardino International Airport.

[5] A PHG is the level of a chemical contaminant in drinking water that does not pose a significant risk to health. PHGs are not regulatory standards. However, state law requires SWRCB to set drinking water standards for chemical contaminants as close to the corresponding PHG as is economically and technologically feasible.

- In October 2019 and July 2020, respectively, the State Water Board issued California Water Code section 13267 Investigative Orders (PFAS Investigative Orders) to 271 chromium plating facilities and 259 Publicly Owned Treatment Works (POTWs).
- In August 2020, the State Water Board issued Sampling Orders to expand public water system testing for PFAS based on previous detections from the 2019 Sampling Orders.
- In February 2021, the State Water Board issued Sampling Orders to public water systems within and adjacent to DOD sites that were identified as having used AFFF.
- In March 2021, the State Water Board issued PFAS Investigative Orders to 162 petroleum refineries and bulk terminals.
- In October 2022, the State Water Board issued Sampling Orders to public water systems. These Sampling Orders rescind and replace the previously issued Sampling Orders from 2020 and 2021. The new Sampling Orders require samples to be analyzed for PFAS using a different analytical method than the method required for the previous Sampling Orders.

In total, 46 chromium plating facilities, 28 POTWs, and 19 refineries and bulk terminals have been subject to the statewide PFAS Investigative Orders in the Santa Ana Region. Santa Ana Water Board staff are responsible for reviewing and responding to information provided by these facilities in response to the Orders. Resulting cleanup activities will be managed by regional staff.

Preliminary results from PFAS investigations within the Santa Ana Region have revealed impacts to groundwater resources from military and industrial sources. The magnitude and extent of these impacts are being evaluated as additional data are collected. The investigation for identification of the major sources of PFAS continues nationwide and throughout California.

Water Board staff will present a background about PFAS and provide an update on the various State Water Board and Santa Ana Water Board activities related to the occurrence of PFAS in the region. Staff will present preliminary data from selected sites and discuss ongoing PFAS investigations.

RECOMMENDATION:

This is an Informational Item - no action is required. The Board may direct staff to perform tasks related to the investigation and remediation of PFAS.