

State of California
Regional Water Quality Control Board
Santa Ana Region
February 5, 2021
Staff Report

Item: 13

Subject: Update on the Investigation of PFAS Contamination in the Santa Ana Region

Background

Board staff will give an overview of some scientific information and provide background and an update on the various State and Regional Water Board activities related to the occurrence of Per- and polyfluoroalkyl substances (PFAS).

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 extensively in surface coating and protectant formulations due to their unique ability to reduce the surface tension of liquids. Perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) are two sub-groups of PFAS that are no longer manufactured in, or imported into the United States; however, there could be some imported goods containing trace amounts of these substances. Other PFAS-containing goods and materials are still produced and used in the United States.

PFAS are manufactured globally and have been used in the production of a wide range of industrial and household products for more than 50 years. 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 repellent textiles; water repellent furniture coating; carpet (stain repellants); polishes; waxes; paints; cleaning products; medical garments; dental floss; and fire-fighting 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 agriculture.

PFAS are persistent in the environment, can accumulate within aquatic animals and human bodies over time, and are toxic at relatively 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 PFOA and PFOS over certain levels may result in adverse health effects, including developmental effects to 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 effects (e.g., antibody production and immunity), thyroid effects and other effects (e.g., cholesterol changes).

PFAS can be introduced into the body by eating or drinking contaminated food or liquid (including water), and by breathing in or touching products treated with PFAS, such as carpets, furniture, or clothing. Exposure to PFOA and PFOS is generally dominated by drinking impacted water and ingestion of impacted food. Food can be contaminated by the PFAS in packaging materials, and some foods such as fish, meat, eggs and leafy vegetables may contain PFAS due to bioaccumulation and crop uptake from contaminated soil or water.

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 is 70 nanograms per liter (or parts per trillion [ppt]) for PFOA and PFOS individually or combined. The U.S. EPA has not established health advisory levels for other chemicals within the PFAS family of compounds.

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. After independent review of the available information on the risks, in July 2018, the California State Water Resources Control Board (State Water Board) - Division of Drinking Water (DDW) established interim Notification Levels³ of 13 ppt and 14 ppt for PFOS and PFOA, respectively, in drinking water. In July 2018, and based on the adopted notification levels, DDW established an interim Response Level⁴ of 70 ppt for the total combined concentration of PFOA and PFOS, consistent with the U.S. EPA's health advisory level

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.

established in 2016. 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. 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 Water Board have initiated investigations to determine magnitude, extent, and potential sources of PFAS contamination. In March 2019, the State Water Board initiated a statewide phased approach for PFAS source investigation at 30 airports and 196 landfills and adjacent public drinking water supply wells.

Additional phases of PFAS investigation at potential sources of release have also been initiated by the State Water Board through the issuance of Water Code section 13267 investigation Orders to 271 chromium plating facilities and 249 Publicly Owned Treatment Works (POTWs) in October 2019 and July 2020, respectively. In September 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. Sampling began in the 4th Quarter of 2020. The next round of source investigation is planned to be conducted statewide by issuing investigative orders to refineries and bulk terminals.

The Santa Ana Regional Water Quality Control Board (Santa Ana Water Board) started oversight of the PFAS investigation in landfills, several Department of Defense (DoD) contaminated sites, and municipal landfills during the 2015 - 2016 timeframe. In July 2018, pursuant to Water Code section 13267, the Santa Ana Water Board issued PFAS Investigation Orders to four active landfills within the Santa Ana Region. Four additional landfills conducted PFAS investigations voluntarily during the 2017-2018 timeframe. In March 2019, and concurrent with the State Water Board's phased approach, the Santa Ana Water Board issued Water Code section 13267 investigation orders to three airports within the region-- John Wayne Airport, Ontario International Airport, and San Bernardino International Airport. In addition, the Emerging Constituent Task Force (coordinated by the Santa Ana Watershed Project Authority (SAWPA) voluntarily undertook an investigation of the occurrence of PFAS in wastewater effluent samples and receiving surface waterbodies along the Santa Ana River during the 2019 - 2020 time frame. Cooperative testing of the treated wastewater from five POTWs that

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.

discharge to the upstream Santa Ana River reveals that PFAS is present in these discharges above the current DDW Notification Levels.

Monthly testing of the Santa Ana River near Imperial Highway by Orange County Water District (OCWD) since August 2016 has also resulted in consistent detections of PFOA (average 20 ng/L) and PFOS (average 17 ng/L) in excess of the current DDW Notification Levels. The results from PFAS investigations within the Santa Ana Region have revealed impacts to groundwater resources due to military sites and various degrees of impact from non-industrial and industrial sources. The results from PFAS sampling in drinking water supply wells in Riverside and Orange counties have shown PFAS concentrations above the current Notification Levels for drinking water. PFAS concentrations of up to 270 ppt for PFOA and 240 ppt for PFOS have been reported in drinking water supply wells in the City of Corona. Santa Ana Water Board staff is currently working to identify potential sources of the PFAS in groundwater in the Corona area.

The investigation for identification of the major sources of PFAS continues nationwide and throughout California.

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.