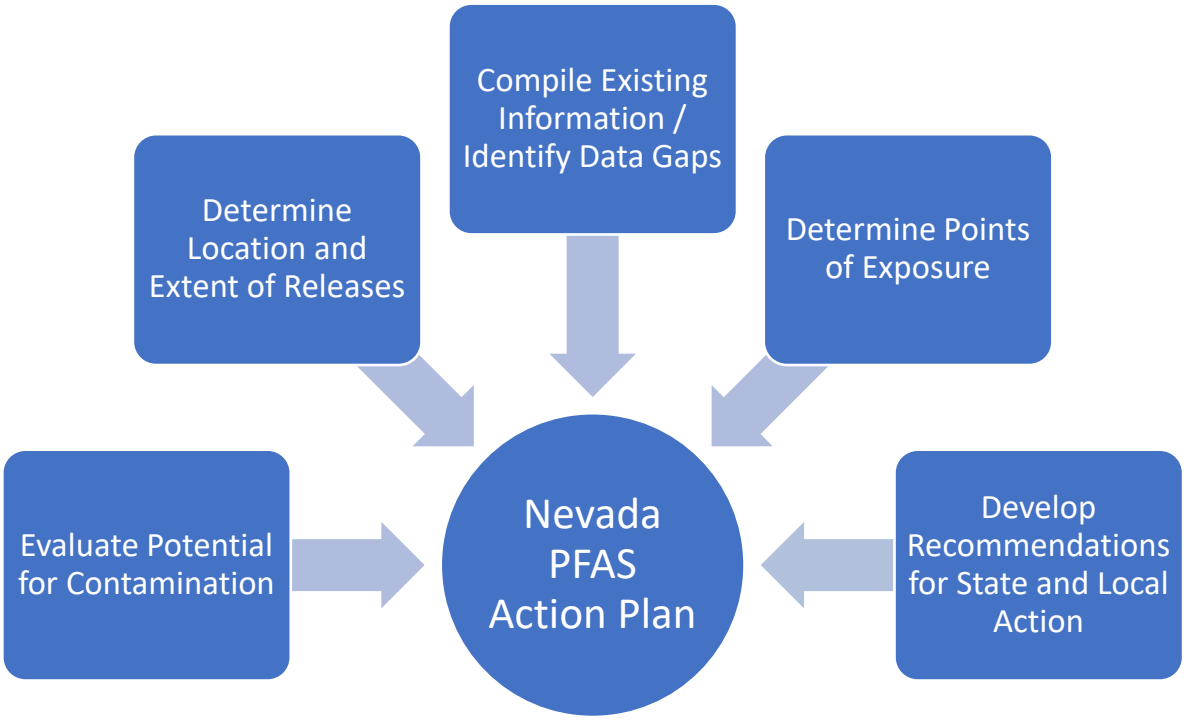
NEVADA DIVISION OF
ENVIRONMENTAL
PROTECTION

Final Nevada PFAS Action Plan



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Abbreviations & Acronyms List

AB 97	Nevada Assembly Bill 97
AFFF	Aqueous Film Forming Foam
AQOPs	Air Quality Operating Permits
ASDWA	Association of State Drinking Water Administrators
BCLs	Basic Comparison Levels
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DoD	Department of Defense
EPA	United States Environmental Protection Agency
FRS	Facility Registry System
GIS	Geographic Information System
ITRC	Interstate Technology and Regulatory Council
HAL	Lifetime Health Advisory Level
MCL	Maximum Contaminant Level
µg/L	Micrograms per liter
NAICS	North America Industry Classification System
NDEP	Nevada Division of Environmental Protection
NGWA	National Groundwater Association
ng/L	Nanograms per liter or parts per trillion (ppt)
OTM	Other Test Method
PFAS	Perfluoroalkyl Substances
PFBS	Perfluorobutanesulfonic Acid
PFHpA	Perfluorohexanoic Acid
PFHXA	Perfluoroheptanoic Acid
PFHxS	Perfluorohexane sulfonate
PFNA	Perfluorononanoic Acid
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanoic Sulfonate
PFPeA	Perfluoropentanoic Acid
POTWs	Publicly Owned Treatment Works

PWSs	Public Water Systems
SWIs	Surface Water Intakes
WWTPs	Wastewater Treatment Plants
UCMR	Unregulated Contaminant Monitoring Rule

1. Introduction

Per- and polyfluoroalkyl substances (PFAS) are a class of emerging contaminants consisting of fluorinated compounds that make up several thousand chemicals. Due to their widespread use, including in consumer and commercial applications such as firefighting foams, stain repellants for clothing and carpets, and other sources, these chemicals are being detected in drinking water supplies, groundwater, surface water, landfill leachate, and air. According to the U.S. Environmental Protection Agency (EPA) peer-reviewed studies show that exposure to certain levels of PFAS may lead to developmental effects in children, increased risk of some cancers, immune system disorders, hormonal interference and increased cholesterol levels (USEPA, 2021b). In 2016 as a result of more advanced laboratory analytical testing and epidemiological studies by federal health and environmental agencies, EPA established a Lifetime Health Advisory Level (HAL) of 70 nanograms per liter (ng/L) (or parts per trillion (ppt)) for the two most widely studied PFAS chemicals, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS). HALs are non-enforceable and non-regulatory advisories designed to provide technical information to state agencies and other public health officials on health effects, analytical methods, and treatment technologies associated with drinking water contamination.

To further investigate PFAS impacts, EPA published a PFAS Strategic Roadmap in November 2021. In May 2022 EPA calculated Regional Screening Levels for tap water for PFOA (6 ng/L), PFOS (4 ng/L), HFPO & HFPO-DA (6 ng/L), and PFBS (600 ng/L). On June 15, 2022, EPA published interim HALs for PFOA (0.004 ng/L) and PFOS (0.02 ng/L). EPA also published HALs for HFPO & HFPO-DA (10 ng/L) and PFBS (2,000 ng/L).

Nevada Assembly Bill AB 97 (AB 97) passed in 2021 called for the establishment of a working group to study issues relating to environmental contamination resulting from PFAS in Nevada. The purpose of the working group is to develop a Nevada PFAS Action Plan (Plan) as defined in Sec. 14.5.2 of AB 97 that will assist the state in achieving the following five objectives:

- Evaluate the potential for environmental contamination in the State resulting from PFAS
- Determine the location and extent of potentially significant discharges or releases of PFAS in the State
- Compile information relating to existing federal, State and local actions and identify data gaps to monitor, contain and clean up environmental contamination resulting from PFAS
- Determine the potential points of exposure to PFAS for residents of the State
- Develop recommendations for state and local action to prevent releases, monitor drinking water sources, and contain and clean up environmental contamination resulting from PFAS

The Nevada Division of Environmental Protection (NDEP) addressed this requirement through the development of a Working Group composed of representatives of interested state and local public agencies, academia, labor organizations, environmental groups, private industry, and trade associations to support the development of the PFAS Action Plan for the State of Nevada.

The overall objective of the Nevada PFAS Action Plan is to synthesize input from the PFAS Working Group and other stakeholders as the first step in creating appropriate, consistent, concise, and collaborative approaches for addressing PFAS in Nevada. This Plan is subject to changes in PFAS regulations promulgated either by EPA or the State. This Plan may be revised by NDEP as and when needed to reflect and incorporate such changes.

2. Potential PFAS in Nevada

This Section of the Action Plan summarizes the current data on environmental contamination from PFAS in the State, the location of potentially significant discharges/releases within the State, and potential exposure to PFAS from these or other sources within the State.

2.1 Current Data Points

The following subsections identify and summarize available and ongoing and potential sources of data relative to PFAS within the State.

2.1.1 EPA and NDEP Bureau of Safe Drinking Water (BSDW)

The third Unregulated Contaminant Monitoring Rule (UCMR 3) was published by EPA on May 2, 2012, requiring groundwater monitoring for 30 contaminants (28 chemicals and two viruses) between 2013 and 2015 using analytical methods developed by EPA, consensus organizations or both. This data consists of Public Water System (PWS) or EPA conducted sampling and analysis for assessment monitoring, screening survey, and pre-screen testing for contaminants. The following PFAS chemicals were selected for assessment monitoring with corresponding minimum reporting limits: perfluorooctanesulfonic acid (PFOS) 0.04 microgram per liter (µg/L), perfluorooctanoic acid (PFOA) 0.02 µg/L, perfluorobutanesulfonic acid (PFBS) 0.09 µg/L, perfluorohexanesulfonic acid (PFHxS) 0.03 µg/L, perfluoroheptanoic acid (PFHpA) 0.01 µg/L, and perfluorononanoic acid (PFNA) 0.02 µg/L.

There are about 600 regulated public water systems in Nevada, of which there are 30 surface water intakes. The list of PWSs sampled in the state of Nevada were: Boulder City, City of Elko, Carson City Public Works, City of Henderson, Dayton Valley Water System, Double Diamond, Edgewood Water Company, Ely Municipal Water Department, Escapee Co-op of NV, Fernley Public Works, Gardnerville Ranchos GID, Las Vegas Valley Water District, North Las Vegas Utilities, Round Mountain PUC, South Truckee Meadows GID, Sun Valley GID, Truckee Meadows Water Authority, and Virgin Valley Water District.

All PFAS results from PWSs in Nevada were below the minimum reporting limits (https://www.epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule#3).

2.1.2 Desert Research Institute Study

A study from researchers at the Desert Research Institute (X. Bai, Y. Son; 2021) evaluated surface water and sediments collected from six locations along the Las Vegas Wash and Lake Mead and eight locations along the Truckee River, Lake Tahoe, and Pyramid Lake in Nevada. Of the 17 perfluoroalkyl compounds analyzed, 12 were detected in the surface water and 14 were detected in the sediments. The "totals" provided in this study were a sum of compound concentrations across multiple sample locations and events and do not represent the concentrations available for potential distribution and/or consumption.

- The predominant compounds found in the water were perfluorohexanoic acid (PFHxA) (1.5 – 187.0 ng/L), followed by perfluoropentanoic acid (PFPeA) (below detection limit [BDL] to 170 ng/L), PFOA (BDL to 65.5 ng/L), and PFBS (BDL to 44.7 ng/L).
- The predominant compounds in the sediments were perfluorodecane sulfonic acid (PFDS) (BDL to 88.2 µg/kg), PFHxA (BDL to 20.3 µg/kg), PFBS (BDL to 29.1 µg/kg), and perfluoroundecanoic acid (PFUA) (BDL to 22.9 µg/kg).

Additional information related to PFAS concentrations and the presence of PFAS in surface water is available in X. Bai, et.al. (2021).

2.1.3 Department of Defense Sampling Data

All DoD-owned and operated drinking water systems have been tested to identify drinking water exceeding the 2016 EPA Lifetime Health Advisory Levels for PFOS and PFOA. DoD drinking water systems at Nellis Air Force Base, Creech Air Force Base, Naval Air Station Fallon, and the Hawthorne Army Deport were tested for the same PFAS analytes as those under UCMR 3 (EPA Method 537) and/or DoD Policy (EPA Method 537.1) with no reported exceedances of the 2016 EPA Lifetime HAL for PFOS and PFOA. Per current DoD policy, these drinking water systems will continue to be monitored for PFAS, and results will be included in installation Consumer Confidence Reports, where applicable.

In addition, DoD follows the federal cleanup law, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (also known as "Superfund"), and long-standing EPA regulations for all chemicals in its cleanup program, including PFAS. As of September 30, 2021, DoD was assessing the following seven installations in Nevada for PFAS use or potential release: Hawthorne Army Depot (Active), Las Vegas Cheyenne Army Aviation Support Facility (National Guard), Reno Army Aviation Support Facility (National Guard), Naval Air Station Fallon (Active), Creech Air Force Base (Active), Nellis Air Force Base (Active), and Reno Tahoe (National Guard). Additional environmental sampling for PFAS, including groundwater and surface water sampling, has been conducted under the CERCLA process, and is, or will be, available as part of the respective Administrative Record.

More information about DoD and PFAS is available online at https://www.defense.gov/Spotlights/PFAS/ and https://denix.osd.mil/dod-pfas/.

2.1.4 Other Research in Nevada

The State is aware that researchers at University Nevada Reno, University Nevada Las Vegas, Southern Nevada Water Authority and USGS are studying PFAS, its presence, effects, and/or more. As these data and results become available, they will be reviewed and incorporated into the State's database.

Additional occurrence information for the Las Vegas Wash, Lake Mead and drinking water is available in Quinones and Snyder (2009).

2.2 Potential Location of Releases

The following subsections identify and summarize generic information on where releases could occur based on other states' experience, in no particular order or ranking of likely release. NDEP is also working to develop a GIS mapping layer to display known PFAS releases within the State.

2.2.1 Publicly Owned Treatment Works / Wastewater Treatment Plants

Most businesses in Nevada discharge their liquid wastes to publicly owned treatment works (POTWs). If the liquid wastes from a commercial facility cannot be discharged to a POTW because of the presence of regulated pollutants, the waste is typically either sent to an industrial landfill, deep-well injected, or sent to an incinerator, depending on the specific waste and regulatory requirements.

Due to the widespread use of PFAS from different sources, all POTWs are expected to receive some PFAS, but not produce PFAS. If PFAS are present, they could ultimately be released to the environment because conventional treatment processes used by POTWs and Wastewater Treatment Plants (WWTPs) are not designed for the treatment of PFAS. Information on Nevada industries that discharge PFAS to a POTW is needed to assess if PFAS releases could be occurring from POTWs. No WWTP in Nevada has been identified that accepts influent from a manufacturer or significant user of PFAS chemicals.

Additional information related to long-term trends of PFAS concentrations and seasonal patterns of the presence of PFAS at wastewater treatment plants is available in Thompson et.al. (2022).

2.2.2 Land Application of Biosolids

Biosolids are typically generated at POTWs. Common sludge treatment processes, e.g., lime treatment, digestion, thermal drying, do not reduce PFAS that may be in sludge from the POTW inputs. Therefore, land application of biosolids from POTWs could be a potential source of PFAS in the environment if there were significant amounts in the influent, which could include consumer product use. However, currently no POTW in Nevada has been identified that accepts influent from a manufacturer or significant user of PFAS chemicals.

2.2.3 Industrial Manufacturing of PFAS or Use in Manufacturing

No industries in Nevada have been identified that manufacture PFAS.

Current or historical manufacturing could have used and/or released PFAS and the use of PFAS in industrial applications could range from minimal (or no) use to significant use. Certain coatings and manufacturing of fluids may have included use of PFAS. Many metal plating operations have historically used PFAS, or still use PFAS for worker safety (e.g., hexavalent chromium plating). Concerns with potential industrial sources should be approached using a process similar to that used for any other potential release, i.e., investigate potential uses and where there was, or could have been, a use, then evaluate for potential releases. Where there was a use and a known or potential release, then a source to the environment could exist. Additional information on potential uses of PFAS in industry are available from EPA (2017, 2021a, 2021b), Glüge et al 2020, and Table 2-5 of the ITRC PFAS guidance.

2.2.4 Aqueous Film Forming Foam (AFFF) Storage and Use Locations

Often AFFFs are used to extinguish difficult to suppress fires (particularly Class B fires involving petroleum products or other flammable liquids), contain or have contained PFAS from the late 1960s to present. Uses and releases of AFFF present potential sources to the environment. AB 97 Sec. 12 and 13, prohibits with certain exceptions discharges of Class B firefighting foam that contains intentionally added perfluoroalkyl and polyfluoroalkyl substances for testing or firefighting training purposes. AFFF is further discussed in Section 6.2 of this document.

3. Sources, Potential Exposure, and Screening Levels

3.1 Sources of Exposure

The following graphic illustrates common sources to the environment and potential exposures that may be relevant to PFAS.

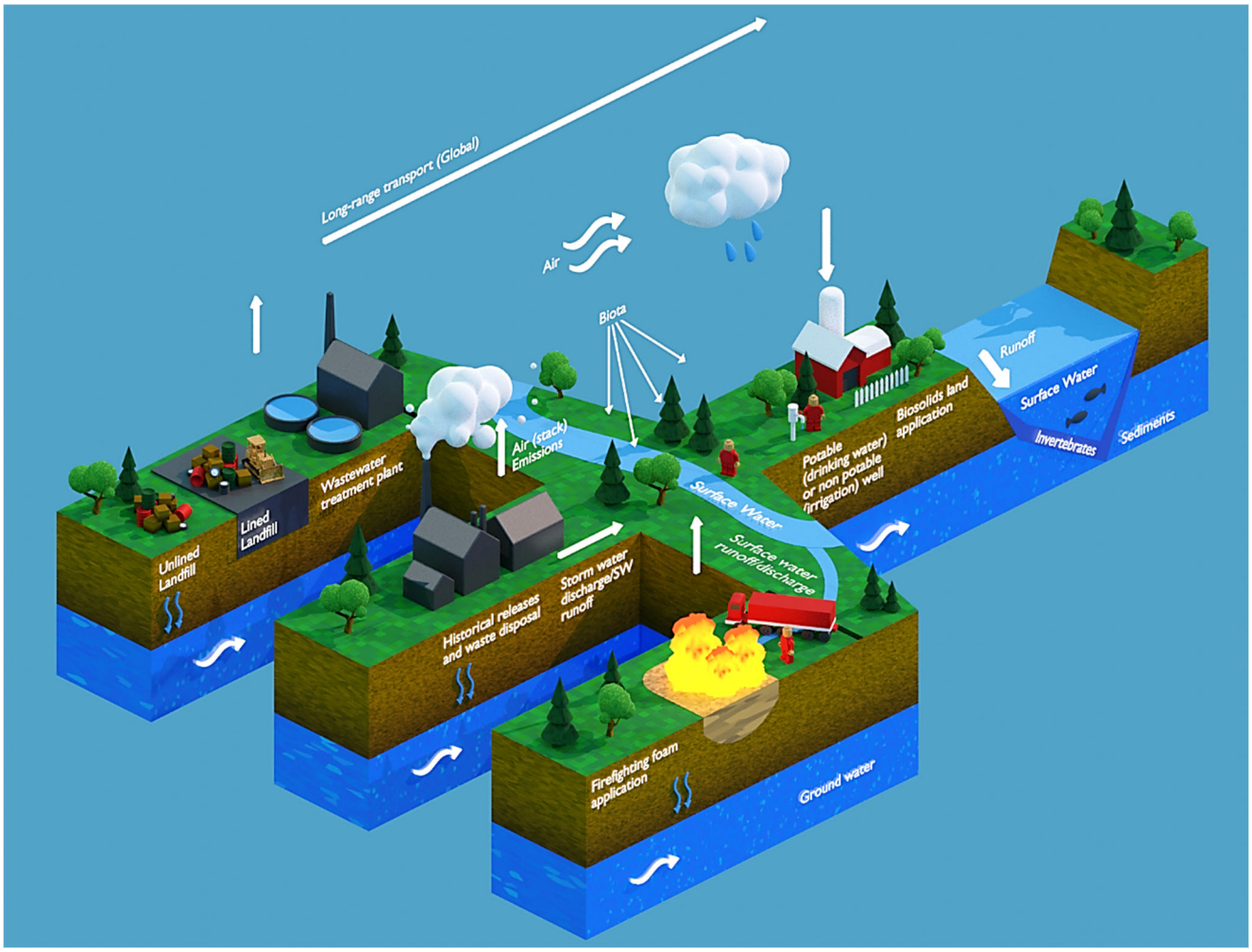

Figure 1 Example Conceptual Site Model (from GHD, 2022)

3.1.1 Drinking Water

Safe drinking water is vital to the public health, welfare, and economy. Ingestion of PFAS in drinking water is one of the potential human exposure pathways. If a water system's sampling data exceeds a maximum contaminant level (MCL) or an action level, then the system is referred to as being non-complaint and has an opportunity to come into compliance. HALs are non-enforceable and non-regulatory advisories, which are different from MCLs or action levels.

Surface water intakes (SWIs) draw water from rivers and lakes after which it undergoes routine testing and treatment prior to supplying the public with drinking water. Groundwater sources draw from wells that extract water from beneath the ground surface after which it, like water from SWI, undergoes routine testing and treatment prior to supplying the public with drinking water. EPA and state drinking water programs are continuously working to ensure the protection of water quality at intakes from pollution. Similar to the protection of groundwater sources, SWI protection areas are designated within the watershed (i.e., Source Water Assessment delineated areas) for management of potential contaminant sources. Protection of water quality at multiple intakes drawing from the same river or lake remains a priority.

3.1.2 Surface Water

PFAS potentially discharged to surface water bodies can result in exposure to humans and aquatic species. PFAS impacted surface water bodies may result from but is not limited to:

- Releases from commercial and industrial sources via permitted discharges or stormwater runoff
- Disposal/land application of municipal biosolids
- Discharge of effluent from municipal wastewater treatment systems
- Release of landfill leachate

Surface water used as a source of drinking water is another potential exposure pathway. Surface water is used in a greater number of ways than other waters (i.e., groundwater) and therefore represents potential direct exposure routes through dermal contact during recreational activities and water ingestion (see 3.1.1 Drinking Water), and indirect exposure through consumption of fish and shellfish (ITRC, 2021).

3.1.3 Groundwater

PFAS containing discharges can potentially impact groundwater (NGWA, 2021). Groundwater used as a drinking water source is a potential exposure pathway (see 3.1.1 Drinking Water). Furthermore, groundwater contaminated with PFAS has the potential to discharge to surface water (NGWA, 2017) and vice versa.

3.1.4 Ambient Air and Dust

Some PFAS are found in ambient air, with elevated concentrations detected or expected in urban areas nearest to major emission sources such as industrial facilities that produce PFAS or use PFAS. Additionally, areas near a release of Class B firefighting foams containing fluorine, waste management facilities including landfills and wastewater treatment plants, and areas of biosolids production and application have observed elevated PFAS concentrations in the air. Atmospheric transport and deposition from points of significant emissions is another potential exposure pathway and may result in PFAS contaminating soil, groundwater, and other media of concern up to several miles from the emission source (ITRC, 2021).

3.2 Tracking of Sources

There is limited tracking of historical PFAS use in Nevada and limited environmental monitoring data. Therefore, the locations of facilities that are potentially associated with PFAS materials as identified in the Association of State Drinking Water Administrators (ASDWA) guidance (ASDWA, Mapping Guide for Per- and Polyfluoroalkyl Substances (PFAS) Source Water Assessments, Appendix A) are being used to help inform where PFAS might be present in the environment. Details on the evaluation are based on the following available information:

3.2.1 Facilities by NAICS Code

1. All facilities with North American Industry Classification System (NAICS) Codes in ASDWA guidance from EPA facility registry system (FRS) database
2. Large Quantity Hazardous Waste Generators with NAICS Codes in ASDWA guidance from EPA FRS database
3. Facilities having air quality operating permits (AQOPs) with NAICS Codes in ASDWA guidance from NDEP database

3.2.2 Facilities from NDEP Databases

1. Landfills
2. POTWs / WWTPs
3. Military bases and other Airports
4. Other facilities (firefighter training, large scale hydrocarbon refining and storage, etc.)

3.2.3 NPDES Permits with EPA

EPA has stated that for federally issued NPDES permits, the agency plans through rulemaking to restrict PFAS discharge, require monitoring for PFAS, require best management practices, and establish practices to address PFAS-containing firefighting foams in storm water (Addressing PFAS Discharges in EPA-Issued NPDES Permits and Expectations Where EPA is the Pretreatment Control Authority, USEPA, 2022). These actions will generate data on sources and quantities.

3.3 Basic Comparison Levels (BCLs)

The NDEP Basic Comparison Levels (BCLs) address human health exposure pathways for use at the BMI Complex and Common Areas in Henderson, Nevada. The comparison of site characterization data against risk-based media concentrations provide for an initial screening evaluation to assist in the evaluation of data usability, determination of extent of contamination, identification of chemicals of potential concern, and identification of preliminary remediation goals. At the BMI Complex and Common Areas, the BCLs for PFOA and PFOS in Residential Water are 0.667 µg/L in addition to PFBS at 667 µg/L. As mentioned in the "User's Guide and Background Technical Document for the Nevada Division of Environmental Protection Basic Comparison Levels for Human Health for the BMI Complex and Common Areas" from 2020, the BCLs for PFOA and PFOS were derived using the toxicity criteria utilized by EPA (2016a, b) to develop the 2016 drinking water health advisories for these two chemicals.

The BMI Complex and Common Areas BCLs were calculated for that location and therefore their applicability at other locations would need to be verified prior to use.

4. PFAS in other States

States across the US are addressing PFAS related issues. Some of these States have historical PFAS manufacturing and use that have contributed to elevated levels of environmental contamination. Furthermore, some States have established maximum contaminant levels (MCLs) for PFAS in addition to guidance values for groundwater and surface water. More information on the specific actions taken by other States is available from the Environmental Council of States (ECOS), EPA and individual state websites.

How states regulate PFAS varies. Some states have regulatory programs for PFAS that may have different priorities, guidelines, and overall focus from other states. California, under Proposition 65, listed PFOS and PFOA as potential developmental (reproductive) toxicants. This listing has labeling requirements for manufacturers, distributors, and retailers of consumer products in addition to prohibiting companies from discharging PFOA or PFOS to sources of drinking water if the discharges would result in exposures that exceed a health-based level. Other states, including Vermont, New York, New Jersey, Colorado, and Alaska, have formal regulations on perfluoroalkyl acids (PFAAs) as

hazardous substances (ITRC, 2021). In contrast, other states have no established regulations and defer to EPA.

Safer States (https://www.saferstates.org/vision/) is at the forefront of a state-driven national movement to address exposures to PFAS with the goal to reduce concentrations and ensure safe drinking water. Chemical management plans for PFAS in other states include elimination of these chemicals from consumer products, limitations/restrictions above a certain quantity, testing of drinking water supplies, requiring manufacturers to disclose PFAS and other information on publicly accessible platforms, prohibiting the sale or distribution of consumer goods, and prohibiting the disposal of PFAS containing foam via incineration. The requirements in AB 97 set forth the first steps for moderating the use and minimizing the release of PFAS in Nevada.

5. PFAS at the Federal Level

The EPA Council on PFAS developed a strategic roadmap to lay out its whole-of-agency approach to address these emerging contaminants. The roadmap sets timelines by which the Agency plans to take specific actions between 2021 and 2024 building upon the policy actions identified in the Agency's 2019 action plan. A proposed drinking water rule is anticipated by the end of 2022 with a final rule promulgated in the fall of 2023. EPA's integrated approach to PFAS is on three main directives:

1. Research – Invest in research, development, and innovation to better understand PFAS exposures and toxicities, human health and ecological effects, and effective interventions that incorporate the best available science.
2. Restrict – Comprehensive approach to prevent PFAS entering the environment at levels that can adversely impact human health and the environment.
3. Remediate – Broaden and accelerate the cleanup of PFAS contamination.

More details related to EPA's roadmap are found in Figure 1 and at the Agency's website.

USEPA PFAS strategic roadmap

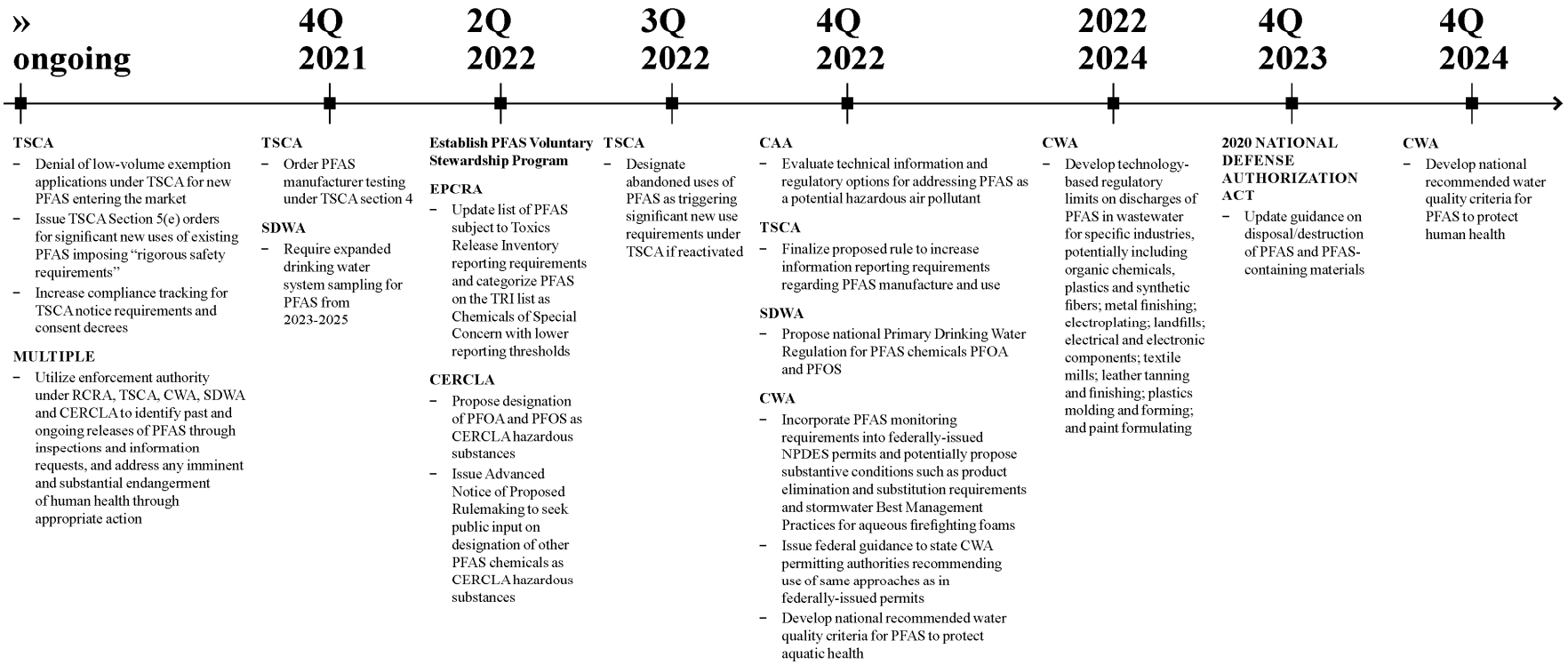

Figure 2 USEPA's Strategic Roadmap (GHD adapted from USEPA 2021c)

6. Recommendations

NDEP in conjunction with the working group developed the following recommendations to fulfill the statutory requirements of AB 97.

6.1 Monitoring and Notification Tools

Monitoring, both required and voluntary, continues to occur in Nevada, and it is recommended that data be shared with NDEP and tools be developed to present the data to the public.

NDEP has utilized a GIS based sampling prioritization tool to conduct a preliminary PFAS screening of drinking water protection areas (DWPA) within Nevada. NDEP has developed DWPAs for public drinking water sources. The tool uses multiple factors to calculate a sample prioritization score for each DWPA and will serve as an initial approach for a screening level evaluation. It is recommended that additional analytical and hydrogeologic data, and location information be added to the tool as information becomes available to help inform characterization of PFAS in Nevada for decision makers and the public, including incorporation and evaluation of the fifth Unregulated Contaminant Monitoring Rule (UCMR 5) data (discussed below). The quality of the data included within the tool should also be reviewed and validated to ensure accuracy and prior to decision making.

Information on Nevada industries that discharge PFAS is needed to assess whether POTWs/WWTPs may be contributing sources of PFAS in the environment.

Additional considerations may be given to address locations in the State that rely on private domestic wells for drinking water, especially near known or suspected sources of PFAS, such as:

a. Providing options for low-cost testing of domestic wells

b. Volunteer sampling programs

c. Providing educational information on PFAS, which could include how to sample for it

Future actions may also include developing a routine monitoring strategy based on the potential exposures identified in order to characterize the extent of PFAS in the environment and potential exposure through drinking water sources, including for disadvantaged communities. The following items are some of the initially planned actions that will support efforts to characterize the extent of PFAS contamination in Nevada:

1. Grant funding from EPA for Drinking Water & Environmental Sampling
2. Using and evaluated data developed through the UCMR 5
3. Investigating if there is grant funding to assist in risk assessment modeling related to PFAS

UCMR 5 published on December 27, 2021, requires sample collection for 30 chemical contaminants (29 PFAS and Lithium) between 2023 and 2025 using analytical methods developed by EPA and consensus organizations. All PWSs serving more than 10,000 people, all serving 3,300 to 10,000 people, and 800 representative PWSs serving fewer than 3,300 people will be monitored. UCMR 5 will provide new data that is needed to improve overall understanding of the frequency of 29 PFAS compounds that may be found in drinking water systems with corresponding levels. Currently, EPA is

responsible for all analytical costs associated with monitoring at systems serving ≤10,000 people. More information on the EPA's monitoring scope can be found at the Agency's website.

The results from the UCMR 5 sampling and monitoring strategies will be compared to the EPA's current HALs. If drinking water sources are impacted above the HALs, then additional consultation, evaluation, and testing are recommended. Further actions will be considered, but not limited to:

a. Notifications to the affected population to not drink the water

b. Treatment or alternative water supplies

c. Investigation of potential sources

d. Blending of water above the HAL with water below the HAL

e. Repeat testing of impacted water supply

Action items for PFAS exceedances, including investigative and clean-up activities, may be required in the future at and from specific sources. Currently, EPA and the State do not regulate PFAS; however, if this were to change, then future action items could include investigation of nature and extent of site-related sources (similar to procedures with other chemicals), treatment or remediation, etc. The path forward in this area is described below.

6.2 Reporting of PFAS Releases in Nevada

NDEP has an existing process for reporting of releases to the environment via the **NDEP Spill Hotline** (toll free by phone (888) 331-6337 or online at ndep.nv.gov). It is recommended to broaden the use of the spill hotline for the reporting of releases of PFAS. Consistent with AB 97, NDEP through the working group has decided to utilize the existing Spill Reporting process currently used by the agency for the reporting requirements established under AB 97 for releases of PFAS, which are as follows:

- Mandatory Reporting of the Discharge, Use, or Release of Class B Firefighting Foams (aka – AFFF) Containing PFAS
- Mandatory Reporting of Any PFAS Released to Surface Waters

In order to expand the use of the spill hotline beyond the above items it is recommended that an outreach, education and training program on the reporting of PFAS via the hotline be provided. A draft reporting guidance is included in Attachment B to this document.

6.3 PFAS Release Response

As monitoring is performed in Nevada, it is likely that response activities may be requested and or required, and it is recommended that a response process be developed.

The NDEP has not formally declared that PFAS releases are subject to environmental cleanup requirements under NAC 445A.226 to 445A.22725 (Action Levels for Contaminated Sites). At this time there are no clear reportable triggers or quantities of PFAS in the environment that must trigger corrective actions, and the regulatory landscape across state and federal governments is in flux as it relates to health-based standards and cleanup levels. However, future federal or state action in the upcoming years will likely result in modification to Nevada's soil, groundwater, and surface water response and cleanup programs. The Action Plan recommends considering the following for cleanup and response actions at this time, including triggers for changes to the regulatory framework:

- Federal action that results in the listing of any PFAS as a hazardous substance under 40 CFR Part 302 would immediately result in the application of Nevada release reporting requirements under NAC 445A.345 to NAC 445A.348 and corrective action requirements under NAC 445A.226 to 445A.22725 for that PFAS.
- If federal action to list PFAS as a CERCLA hazardous substance does not occur within a timeframe that meets Nevada's need to address impacts identified in the State, the State may pursue regulatory rulemaking to establish reporting requirements and cleanup action levels for soil and groundwater contamination.
- Federal action that results in the establishment of a Maximum Contaminant Limit for any PFAS pursuant to the Safe Drinking Water Act would immediately establish action levels and remediation standards for groundwater in the State of Nevada. Until that time, the NDEP will consider the Lifetime HALs as the appropriate groundwater screening level.
- The US Environmental Protection Agency has published Regional Screening Levels for five commonly detected PFAS (https://www.epa.gov/risk/regional-screening-levels-rsls). The NDEP Bureau of Corrective Action relies on these screening levels when making decisions about site investigation and cleanup for soil impacts.
- For releases of PFAS containing products to paved surfaces, property owners or operators should take appropriate steps to contain, treat, and properly dispose of any adsorbent material used to prevent the product from reaching soil or storm drain inlets. Documentation of the response actions taken may be submitted voluntarily to the NDEP Bureau of Corrective Action, similarly to what is done under NAC 445A.2269(3)(c) for other hazardous substances, hazardous wastes, or regulated substances released to paved surfaces.

6.4 Outreach and Communication Plan

The most effective risk communication strategies employ a combination of techniques that build trust and demonstrate a partnership with the community through clear science communication that is accessible, factual, and transparent. The dynamic considerations related to communicating PFAS challenges to concerned citizens, the regulated community, and other stakeholders are important for transparency and collaboration within the State of Nevada. Therefore, it is recommended that outreach and communication tools be developed and made available for use within the State.

Numerous agencies and other stakeholders participating in the Working Group have successful education and outreach programs related to PFAS that may help the public, community utilities, businesses, and local decision makers understand the issues and leverage available resources. Future partnering, including funding, between new and/or existing programs to share outreach and education tools about PFAS can be a mechanism to reach broader audiences and leverage resources to address PFAS. Stormwater, non-point source pollution, source water protection, corrective action, science education and public health are all programs that have active outreach components where PFAS education could be incorporated.

All PFAS updates, communications, and tools for water system operators for public notice related to this action plan are recommended to be made available via NDEP's website, http://ndep.nv.gov/water/pfas-action-plan. Example communication tools are also included as Attachment C to this document.

6.5 Analytical Methods and Procedures

Analytical methods for PFAS detection, identification, and quantitation continue to be revised as improvements are made to sample preparation and instrumentation techniques and it is recommended that the most current methods, including evaluation of appropriate reporting limits, be considered.

At present, EPA has several multi-laboratory validated methods specifically for drinking water samples. EPA Method 533 focuses on short-chain PFAS compounds including perfluorinated acids, sulfonates, fluorotelomers, and poly/perfluorinated ether carboxylic acids. EPA Method 537.1 focuses on the PFAS compounds that have the potential to contaminate drinking water that have been identified or introduced as PFOA/PFOS alternatives such as HFPO-DA (component of GenX processing aid technology). Both of these methods combined can quantify 29 unique PFAS compounds in drinking water. EPA Method 8327 is a liquid chromatography/tandem mass spectrometry method for the analysis of 24 PFAS compounds in aqueous and solid samples. Draft Method 1633 is currently a single-laboratory validated method for 40 PFAS compounds in wastewater, surface water, groundwater, soil, biosolids, sediment, landfill leachate, and fish tissue. This draft method is being developed in collaboration with EPA and the Department of Defense (DoD). A multi-laboratory validation study will be conducted by DoD with the EPA.

Other PFAS and fluorine analytical methods are in different stages of development such as the Other Test Method (OTM)-45. Draft Method 1621, which measures total adsorbable organic fluorine in aqueous samples has been released as a screening tool to identify PFAS absence and presence at the microgram per liter level. More information on all of the analytical methods is available at the Agency's website. Furthermore, practical comparisons of the available methods have been performed by the Interstate Technology and Regulatory Council's (ITRC's) PFAS team and is available in the current technical guidance document.

6.6 Treatment Technologies

Treatment technologies for PFAS-impacted matrices including soil and water are still evolving, and it is recommended that the most current technologies be considered. Remedial alternatives are being prioritized based on the overall protection of drinking water supplies, reduction of exposure to sensitive receptors such as ecological receptors and environmental resources, and reduction of source area mass.

At this point, a variety of treatment technologies are available at different stages of implementation. The field-implemented technologies that are demonstrated at full-scale for liquids are sorption technologies such as granular activated carbon and ion exchange resin. Additionally, reverse osmosis that pushes water under pressure through a semipermeable membrane has been demonstrated at full-scale for PFAS removal. Such technologies remove PFAS from water, but do not destroy PFAS; therefore, these technologies result in a waste stream of PFAS that must be properly disposed of or treated. However, the choice of removal techniques may be highly dependent upon the contaminant and its concentrations, as well the criteria to be achieved, e.g., these technologies may not be able to affordably treat to very low levels of PFAS.

The field-implemented technologies that are demonstrated at full-scale for solids are sorption followed by stabilization to reduce the potential for PFAS to leach from the material and subsequently, excavated be for disposal to permitted landfills.

Other treatment technologies are available for liquids and solids. Practical comparisons of the available technologies are found within the ITRC's PFAS Team technical guidance document. Additional studies and information are also available on the State's website.

6.7 Other Needs

Potential existing or future funding sources, State or federal, should be identified to assist private and public entities to obtain solutions to PFAS related issues, concerns, opportunities, etc.

In general, the Nevada environmental programs strive to make informed decisions using science and have relied on the federal scientific process to set regulations. The knowledge of and around PFAS continues to grow, but additional information is needed to better understand the risks posed by PFAS and to be able to take effective and appropriate actions to protect human health and the environment. Research by EPA and other organizations (EPA Increasing PFAS understanding; ITRC PFAS Fact Sheets) are helping to deepen the understanding of these chemicals so that we can continue to make appropriate decisions regarding PFAS and provide certainty to the regulated community and the public. There is an ongoing need to consider newly identified and relevant existing and future PFAS related research, data, technology, regulatory limits, and health studies as it becomes available.

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Glossary

Action level	a regulatory level of a harmful or toxic substance/activity in air, water or soil which if exceeded requires monitoring or clean-up
Biosolids	treated sewage sludge used for land application and surface disposal (EPA)
Contaminant	any physical, chemical, biological or radiological substance or matter which is added to (NAC-445A) water
Discharge	any addition of a pollutant to water (NAC-445A)
Effluent	chemical, physical, biological and other constituents which are discharged from point sources into any waters of the State. (NAC-445A)
Exposure pathway	refers to the way a person can come into contact with a hazardous substance. There are three basic exposure pathways: inhalation, ingestion, or direct contact. (EPA)
Hazardous substance	includes, without limitation, hazardous material, a regulated substance, a pollutant and a contaminant (NAC-445A)
Incineration	burning of certain types of solid, liquid, or gaseous materials; or a treatment technology (EPA)
Influent	water, waste water or other liquid flowing into a reservoir, basin or treatment plant (OECD)
Leachate	formed when rain water filters through wastes placed in a landfill. When this liquid comes in contact with buried wastes, it leaches, or draws out, chemicals or constituents from those wastes (EPA)
Non-point source pollution	pollution caused by land runoff, precipitation, atmospheric deposition, drainage, seepage or hydrologic modification (EPA)
Point source	any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. The term does not include return flows from irrigated agriculture. (NAC-445A)
Pollutant	dredged soil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal and agricultural waste discharged into water (NAC-445A)
Pollution	artificially made or artificially induced alterations of the chemical, physical, biological and radiological integrity of water (NAC-445A)

Attachments

Attachment A	Links to embedded websites, example document(s), and sources of additional tools/information
Attachment B	DRAFT Guidance for Reporting of PFAS Releases in Nevada
Attachment C	Public Notice Templates

Attachment A

Links to embedded websites, example document(s), and sources of additional tools/information

1) Occurrence of Perfluoroalkyl Carboxylates and Sulfonate in Drinking Water Utilities and Related Water from the United States. Quiñones and Snyder 2009. (https://doi.org/10.1021/es9024707)
2) Occurrence Data from the Unregulated Contaminant Monitoring Rule Number 3. USEPA 2012. (https://www.epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule#3)
3) Addressing the Impacts of PFAS in Biosolids. Sheets and Ledoux 2021. (https://www.wwdmag.com/biosolids-management/addressing-impacts-pfas-biosolids)
4) PFAS - The Environmental Council of the States. ECOS 2022 (https://www.ecos.org/pfas/)
5) U.S. State Resources about PFAS. USEPA 2022 (https://www.epa.gov/pfas/us-state-resources-about-pfas)
6) Safer States (https://www.saferstates.org/vision/)
7) PFAS Strategic Roadmap: EPA's Commitments to Action 2021-2024. USEPA 2022. (https://www.epa.gov/pfas/pfas-strategic-roadmap-epas-commitments-action-2021-2024)
8) Fifth Unregulated Contaminant Monitoring Rule. USEPA 2022 (https://www.epa.gov/dwucmr/fifth-unregulated-contaminant-monitoring-rule)
9) Regional Screening Levels. USEPA 2022 (https://www.epa.gov/risk/regional-screening-levels-rsls)
10) Nevada Division of Environmental Protection PFAS Action Plan. NDEP 2022 (http://ndep.nv.gov/water/pfas-action-plan)
11) EPA Method 533: Determination of Per- and Polyfluoroalkyl Substances in Drinking Water by Isotope Dilution Anion Exchange Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry. USEPA 2019 (https://www.epa.gov/sites/default/files/2019-12/documents/method-533-815b19020.pdf)
12) EPA Method 537.1: Determination of Selected Per- and Polyfluorinated Alkyl Substances in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS). USEPA 2022 (https://cfpub.epa.gov/si/si_public_record_Report.cfm?dirEntryId=343042&Lab=NERL)
13) EPA Draft Method 1633 for 40 PFAS Compounds. USEPA 2022 (https://www.epa.gov/cwa-methods/cwa-analytical-methods-and-polyfluorinated-alkyl-substances-pfas)
14) PFAS Analytical Methods Development and Sampling Research. USEPA 2022 (https://www.epa.gov/water-research/pfas-analytical-methods-development-and-sampling-research)
15) ITRC PFAS Technical Guidance Document. ITRC 2022 (https://pfas-1.itrcweb.org/11-sampling-and-analytical-methods/#11_2)
16) Technical Resources for Addressing Environmental Releases of Per- and Polyfluoroalkyl Substances (PFAS). ITRC 2021 (https://pfas-1.itrcweb.org/)
17) Increasing Our Understanding of the Health Risks from PFAS and How to Address Them. USEPA 2021 (https://www.epa.gov/pfas/increasing-our-understanding-health-risks-pfas-and-how-address-them)
18) Treatment of Poly- and Perfluoroalkyl Substances in U.S. Full-Scale Water Treatment Systems. Appleman et al. 2014 (http://dx.doi.org/10.1016/j.watres.2013.10.067)
19) Nanofiltration and Granular Activated Carbon Treatment of Perfluoroalkyl Acids. Appleman et al. 2013 (http://dx.doi.org/10.1016/j.jhazmat.2013.06.033)
20) Granular Activated Carbon Adsorption of Perfluoroalkyl Acids from Ground and Surface Water. Kempisty et al. 2022 (https://doi.org/10.1002/aws2.1269)

21) Granular Activated Carbon-Based Treatment and Mobility of Per-and Polyfluoroalkyl Substances in Potable Reuse for Aquifer Recharge. Gonzalez et al. 2021 (https://doi.org/10.1002/aws2.1247)
22) Removal of Perfluoroalkyl and Polyfluoroalkyl Substances in Potable Reuse Systems (https://doi.org/10.1016/j.watres.2018.07.018)
23) Perfluoroalkyl and Polyfluoroalkyl Substances. Military Health System 2019. (https://www.health.mil/Military-Health-Topics/Combat-Support/Public-Health/PFAS)
24) Per- and Polyfluoroalkyl Substances (PFAS). SERDP – ESTCP (https://www.serdp-estcp.org/Featured-Initiatives/Per-and-Polyfluoroalkyl-Substances-PFASs)
25) Department of Defense Per- and Polyfluoroalkyl Substance. DENIX (https://denix.osd.mil/dod-pfas/home/)
26) Air Force Response to PFAS. US Air Force Civil Engineer Center. (https://www.afcec.af.mil/WhatWeDo/Environment/Perfluorinated-Compounds/)
27) Air Force Administrative Record 2.3.0. US Air Force Civil Engineer Center (https://ar.afcec-cloud.af.mil/)
28) Memorandum for Nellis Air Force Base – Consumer Confidence Report (CCR). Department of the Air Force 2021 (https://www.nellis.af.mil/Portals/104/PWS%20NV0003028%202020%20CCR%20Final-508.pdf)
29) DON'S Strategic Management Response for PFAS. US Department of the Navy. (https://www.secnav.navy.mil/eie/Pages/PFAS_Home.aspx)
30) Environmental Restoration Program. US Department of the Navy (https://www.navfac.navy.mil/Business-Lines/Environmental/Products-and-Services/Environmental-Restoration/installation_map/states/nevada/)
31) Navy Consumer Confidence Report (CCR). US Department of Navy (https://www.cnic.navy.mil/Regions/cnrsw/om/environmental_support/water_quality_information
32) Army Per- and Polyfluoroalkyl Substances. DENIX (https://www.denix.osd.mil/army-pfas/home/)

Attachment B

DRAFT Guidance for Reporting of PFAS Releases in Nevada

DRAFT Guidance for Reporting of Per- and Polyfluoroalkyl Substances (PFAS) Releases in Nevada

This draft guidance for reporting was prepared in May 2022 by the Nevada Division of Environmental Protection (NDEP).

Mandatory Reporting of the Discharge, Use, or Release of Class B Firefighting Foams Containing PFAS

- Authority for mandatory reporting comes from Nevada Revised Statutes (NRS) 459.684.
- Military installations and civilian airports, under the authority of the Federal Aviation Administration, are exempt from this requirement.
- This requirement does not apply to any other class of firefighting foams/products and does not apply to any Class B foam that does not contain PFAS. Before using a Class B firefighting foam and before reporting of any discharge or release, the operator should confirm through consultation of the Safety Data Sheets (SDS) or other product labelling or documentation whether the formulation of the Class B firefighting foam contains PFAS.
- The mandatory reporting is not limited to accidental releases and includes any intentional use or discharge of Class B firefighting foams containing PFAS including during firefighting actions, operation of fire suppression systems, or testing of delivery equipment. Accidental releases of Class B firefighting foams containing PFAS must be reported for any amount and under any circumstance.
- Reports of PFAS release should include the time, date, location, and an estimate of the amount of the discharge, use, or release of the foam. If intentional, the purpose or reason for the discharge or use should be clearly stated, and if the purpose was for the testing of a fire suppression system or delivery mechanism of a mobile vehicle, the reporter must verify that the measures necessary to contain, treat, and properly dispose of the foam were present and were implemented.
- Reporters should indicate to the Spill Hotline either verbally on the phone or through selection of the appropriate field online that the report is being made in accordance with NRS 459.684 (or Assembly Bill 97), so that data specific to the discharge, use or release of Class B firefighting foams containing PFAS may be tracked.
- All firefighting training with Class B firefighting foams containing PFAS is prohibited in accordance with NRS 459.682(1)(b). Any reports received through the Spill Hotline of firefighting training with PFAS foams will be investigated as a possible misdemeanor.

Mandatory Reporting of Any PFAS Released to Surface Waters

- Authority for mandatory reporting comes from the definition of "pollutant" and "contaminant" in the release reporting regulations at Nevada Administrative Code 445A.345 to NAC 445A.348, inclusive.
- Mandatory reporting applies to any amount of any product which contains intentionally added PFAS released or discharged to surface water.
- Military installations and civilian airports are not exempt from the requirement to report releases of PFAS to surface waters.

- Any permitted discharges to surface water should be handled under permit reporting requirements and limits. Volunteer reporting to be sought where not required under permit.
- Response actions should be implemented immediately by the responsible party to mitigate uncontrolled flow of PFAS containing products.
- Regulatory follow-up from State and local officials with authority over water quality should be expected.

Strongly Encouraged Reporting for Detection of PFAS in Groundwater

- The definition of "pollutant" and "contaminant" in the release reporting regulations at NAC 445A.245 to NAC 445A.348, inclusive may support mandatory reporting of the discovery of PFAS to groundwater; however, at this time the NDEP is only strongly encouraging the reporting of PFAS discovery in groundwater.
- Action taken by the US Environmental Protection Agency (EPA) to list PFAS as a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substance would make reporting to NDEP of PFAS discoveries in groundwater mandatory rather than strongly encouraged, based on the definition of "hazardous substance" in the state's release reporting regulations.
- Reports of concentrations above EPA Lifetime Health Advisory Levels (HALs) may result in follow-up actions to prioritize the identification of sources and to provide guidance to potentially affected drinking water receptors.
- Reporting of groundwater concentrations of PFAS below EPA Lifetime HALs will still assist the NDEP to understand the prevalence of PFAS in groundwater statewide and to prioritize source identification, but the reporting party should not expect the initiation of response actions or follow-up contact.

Voluntary Reporting of Any Other PFAS Release or Discovery

- The NDEP Spill Hotline takes all calls it receives and generates a Spill Report even if the release does not appear to meet reportable triggers. Any release of PFAS to soil or paved surfaces can be reported to the Spill Hotline.
- The Spill Hotline will route any accidental releases of PFAS to the soil or paved surfaces to the Bureau of Corrective Actions, other NDEP bureaus, and local agencies for informational purposes. The Bureau of Corrective Action may work with property owners or operators on a voluntary basis to document response actions to contain, treat, and dispose of released product or contaminated material.
- Action taken by the EPA to list PFAS as a CERCLA hazardous substance would make reporting to NDEP of PFAS releases mandatory rather than voluntary, based on the definition of "hazardous substance" in the State's release reporting regulations. However, the NDEP would issue guidance on the reportable quantity of PFAS releases subject to reporting.

Use of Information Obtained Through the NDEP Spill Hotline

- Spill/Complaint Reports generated by the NDEP Spill Hotline are routed to state or local agencies that have regulatory authority to respond or follow-up on the information. For PFAS

releases, which may not have defined regulatory triggers for action, the NDEP Spill Hotline will route the report as though it were any other hazardous substance subject to regulation. Receiving agencies will make the determination whether regulatory action is authorized and appropriate.

- One of the purposes of the PFAS Action Plan is to inform policy makers about the prevalence and scope of PFAS use or impacts in the State, so the NDEP Spill Hotline will make all information about PFAS Spill Reports available to stakeholder agencies upon request and will generate summary reports that are made publicly available on the NDEP PFAS webpages.

Attachment C

Public Notice Templates

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

_____ Public Water Systems (PWS ID# NV000____) Has Levels of Perfluorooctance Sulfonic Acid (PFOS) Above A Drinking Water Advisory Limit

Our water system recently exceeded the EPA Health Advisory Limit, and as our customers, you have a right to know what happened, what you should do, and what we *[did/are doing]* to correct this situation.

While we routinely monitor for the presence of Federal and State regulated drinking water contaminants, Nevada has not yet adopted a standard, or maximum contaminant level (MCL), for PFOA.The EPA Health Advisory Limit for PFOS is 0.02 parts per trillion (ng/L) and is based on a running annual average (RAA), in which the four most recent quarters of monitoring data are averaged. On *[date],* we received notice that the sample*(s)* collected on *[date(s)]* showed that our system exceeds the PFOA advisory limit. The RAA for PFOA based on samples collected over the last year is *[level]* ng/L

What is PFOS?

Perfluorooctance sulfonic acid (PFOS) is a member of the group of chemicals called per- and polyfluoroalkyl substances (PFAS), used as a processing aid in the manufacture of fluoropolymers used in stain-resistant fabrics and other products, as well as other commercial and industrial uses, based on its resistance to harsh chemicals and high temperatures. PFOS has also been used in aqueous film-forming foams for firefighting and training, and it is found in consumer products such as stain-resistant coatings for upholstery and carpets, water-resistant outdoor clothing, and greaseproof food packaging. Major sources of PFOS in drinking water include discharge from industrial facilities where it was made or used and the release of aqueous film-forming foam. Although the use of PFOS has decreased substantially, contamination is expected to continue indefinitely because it is extremely persistent in the environment and is soluble and mobile in water.

What does this mean?

**People who drink water containing PFOS in excess of the advisory over time could experience problems with their blood serum cholesterol levels, liver, kidney, immune system, or, in males, the reproductive system. Drinking water containing PFOS in excess of the advisory over time may also increase the risk of testicular and kidney cancer. For females, drinking water containing PFOS in excess of the advisory over time may cause developmental delays in a fetus and/or an infant. Some of these developmental effects may persist through childhood.*

** For specific health information, see*
https://www.epa.gov/system/files/documents/2022-06/technical-factsheet-four-PFAS.pdf

What should I do?

- If you have specific health concerns, a severely compromised immune system, have an infant, are pregnant, or are elderly, you may be at higher risk than other individuals and should seek advice from your health care providers about drinking this water.
- You may choose to use a home water filter that is certified to reduce levels of PFOS for drinking and cooking to reduce exposure to PFOS. Home water treatment devices are available that can reduce levels of PFOS. For more specific information regarding the effectiveness of home water filters for reducing PFOS, visit the National Sanitation Foundation (NSF) International website, http://www.nsf.org/.
- Boiling your water will not remove PFOS.

For more information, see https://www.epa.gov/pfas

What is being done?
[Describe corrective action]. We anticipate resolving the problem within *[estimated time frame].*

[For community water systems, if only one portion of the service area is impacted and you were granted permission from the state to limit the distribution of the public notice, it is highly recommended to include a map of the afflicted area. The system should copy and paste a map below if it elects to include one]

OPTION: Only a portion of our service area, specifically *[AREA]* is affected by this public notice. Please see find a map illustrating the affected area *[attached/enclosed/below].*

For more information, please contact *[name of contact]* at *[phone number]* or *[mailing address]*.

> **Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.**

This notice is being sent to you by *[Public Water System].* PWS ID# NV000_____.
Date distributed: _____.

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

_____ Public Water Systems (PWS ID# NV000____) Has Levels of Perfluorooctanoic Acid (PFOA) Above A Drinking Water Advisory Limit

Our water system recently exceeded the EPA Health Advisory Limit, and as our customers, you have a right to know what happened, what you should do, and what we *[did/are doing]* to correct this situation.

While we routinely monitor for the presence of Federal and State regulated drinking water contaminants, Nevada has not yet adopted a standard, or maximum contaminant level (MCL), for PFOA.The EPA Health Advisory Limit for PFOA is 0.004 parts per trillion (ng/L) and is based on a running annual average (RAA), in which the four most recent quarters of monitoring data are averaged. On *[date],* we received notice that the sample*(s)* collected on *[date(s)]* showed that our system exceeds the PFOA advisory limit. The RAA for PFOA based on samples collected over the last year is *[level]* ng/L.

What is PFOA?

Perfluorooctanoic acid (PFOA) is a member of the group of chemicals called per- and polyfluoroalkyl substances (PFAS), used as a processing aid in the manufacture of fluoropolymers used in non-stick cookware and other products, as well as other commercial and industrial uses, based on its resistance to harsh chemicals and high temperatures. PFOA has also been used in aqueous film-forming foams for firefighting and training, and it is found in consumer products such as stain-resistant coatings for upholstery and carpets, water-resistant outdoor clothing, and greaseproof food packaging. Major sources of PFOA in drinking water include discharge from industrial facilities where it was made or used and the release of aqueous film-forming foam. Although the use of PFOA has decreased substantially, contamination is expected to continue indefinitely because it is extremely persistent in the environment and is soluble and mobile in water.

What does this mean?

**People who drink water containing PFOA in excess of the advisory over time could experience problems with their blood serum cholesterol levels, liver, kidney, immune system, or, in males, the reproductive system. Drinking water containing PFOA in excess of the advisory over time may also increase the risk of testicular and kidney cancer. For females, drinking water containing PFOA in excess of the advisory over time may cause developmental delays in a fetus and/or an infant. Some of these developmental effects may persist through childhood.*

** For specific health information, see*
https://www.epa.gov/system/files/documents/2022-06/technical-factsheet-four-PFAS.pdf

What should I do?

- If you have specific health concerns, a severely compromised immune system, have an infant, are pregnant, or are elderly, you may be at higher risk than other individuals and should seek advice from your health care providers about drinking this water.
- You may choose to use a home water filter that is certified to reduce levels of PFOA for drinking and cooking to reduce exposure to PFOA. Home water treatment devices are available that can reduce levels of PFOA. For more specific information regarding the effectiveness of home water filters for reducing PFOA, visit the National Sanitation Foundation (NSF) International website, http://www.nsf.org/.
- Boiling your water will not remove PFOA.

For more information, see https://www.epa.gov/pfas

What is being done?
[Describe corrective action]. We anticipate resolving the problem within *[estimated time frame].*

[For community water systems, if only one portion of the service area is impacted and you were granted permission from the state to limit the distribution of the public notice, it is highly recommended to include a map of the afflicted area. The system should copy and paste a map below if it elects to include one]

OPTION: Only a portion of our service area, specifically *[AREA]* is affected by this public notice. Please see find a map illustrating the affected area *[attached/enclosed/below].*

For more information, please contact *[name of contact]* at *[phone number]* or *[mailing address]*.

> **Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.**

This notice is being sent to you by *[Public Water System].* PWS ID# NV000_____.
Date distributed: _____.

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

_____ Public Water Systems (PWS ID# NV000____) Has Levels of Perfluoroctanoic Acid (PFOA) and/or Perfluorooctance Sulfonic Acid (PFOS) Above A Drinking Water Advisory Limit

Our water system recently exceeded the EPA Health Advisory Limit, and as our customers, you have a right to know what happened, what you should do, and what we *[did/are doing]* to correct this situation.

While we routinely monitor for the presence of Federal and State regulated drinking water contaminants, Nevada has not yet adopted a standard, or maximum contaminant level (MCL), for PFOA or PFOS.The EPA Health Advisory Limit for PFOS is 0.02 parts per trillion (ng/L) and for PFOA is 0.004 parts per trillion (ng/L) both are based on a running annual average (RAA), in which the four most recent quarters of monitoring data are averaged. On *[date]*, we received notice that the sample*(s)* collected on *[date(s)]* showed that our system exceeds the PFOA and/or PFOS advisory limit. The RAA for PFOA and PFOS is based on samples collected over the last year and the is currently *[level]* ng/L

What is PFOS and/or PFOA?

Perfluorooctance sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) are members of the group of chemicals called per- and polyfluoroalkyl substances (PFAS), they are used as a processing aid in the manufacture of fluoropolymers used in stain-resistant fabrics and other products, as well as other commercial and industrial uses, based on its resistance to harsh chemicals and high temperatures. PFOS and/or PFOA has also been used in aqueous film-forming foams for firefighting and training, and it is found in consumer products such as stain-resistant coatings for upholstery and carpets, water-resistant outdoor clothing, and greaseproof food packaging. Major sources of PFOS and/or PFOA in drinking water includes discharges from industrial facilities where it was made or used and the release of aqueous film-forming foam. Although the use of PFOS and/or PFOA has decreased substantially, contamination is expected to continue indefinitely because it is extremely persistent in the environment and is soluble and mobile in water.

What does this mean?

**People who drink water containing PFOS and/or PFOA in excess of the advisory over time could experience problems with their blood serum cholesterol levels, liver, kidney, immune system, or, in males, the reproductive system. Drinking water containing PFOS and/or PFOA in excess of the advisory over time may also increase the risk of testicular and kidney cancer. For females, drinking water containing PFOS and/or PFOA in excess of the advisory over time may cause developmental delays in a fetus and/or an infant. Some of these developmental effects may persist through childhood.*

** For specific health information, see*
https://www.epa.gov/system/files/documents/2022-06/technical-factsheet-four-PFAS.pdf

What should I do?

- If you have specific health concerns, a severely compromised immune system, have an infant, are pregnant, or are elderly, you may be at higher risk than other individuals and should seek advice from your health care providers about drinking this water.

- You may choose to use a home water filter that is certified to reduce levels of PFOS and/or PFOA for drinking and cooking to reduce exposure to PFOS/PFOA. Home water treatment devices are available that can reduce levels of PFOS/PFOA. For more specific information regarding the effectiveness of home water filters for reducing PFOS and/or PFOA, visit the National Sanitation Foundation (NSF) International website, http://www.nsf.org/.
- Boiling your water will not remove PFOS and/or PFOA.

For more information, see https://www.epa.gov/pfas

What is being done?

[Describe corrective action]. We anticipate resolving the problem within *[estimated time frame].*

[For community water systems, if only one portion of the service area is impacted and you were granted permission from the state to limit the distribution of the public notice, it is highly recommended to include a map of the afflicted area. The system should copy and paste a map below if it elects to include one]

OPTION: Only a portion of our service area, specifically *[AREA]* is affected by this public notice. Please see find a map illustrating the affected area *[attached/enclosed/below].*

For more information, please contact *[name of contact]* at *[phone number]* or *[mailing address]*.

> **Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.**

This notice is being sent to you by *[Public Water System].* PWS ID# NV000_____.
Date distributed: _____.

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

_____ Public Water Systems (PWS ID# NV000____) Has Levels of Perfluorobutanesulfonic Acid (PFBS) Above A Drinking Water Advisory Limit

Our water system recently exceeded the EPA Health Advisory Limit, and as our customers, you have a right to know what happened, what you should do, and what we *[did/are doing]* to correct this situation.

While we routinely monitor for the presence of Federal and State regulated drinking water contaminants, Nevada has not yet adopted a standard, or maximum contaminant level (MCL), for PFBS. EPA Health Advisory Limit for PFBS is 2000 parts per trillion (ng/L) and is based on a running annual average (RAA), in which the four most recent quarters of monitoring data are averaged. On *[date]*, we received notice that the sample*(s)* collected on *[date(s)]* showed that our system exceeds the PFBS advisory limit. The RAA for PFBS based on samples collected over the last year is *[level]* ng/L.

What is PFBS?

Perfluorobutanesulfonic Acid (PFBS) is a member of the group of chemicals called per- and polyfluoroalkyl substances (PFAS), used as a processing aid in the manufacture of fluoropolymers used in non-stick cookware and other products, as well as other commercial and industrial uses, based on its resistance to harsh chemicals and high temperatures. PFBS has been used as a replacement chemical for perfluorooctance Sulfonic acid (PFOS) which has been used in aqueous film-forming foams for firefighting and training, and it is found in consumer products such as stain-resistant coatings for upholstery and carpets, water-resistant outdoor clothing, and greaseproof food packaging. Major sources of PFBS in drinking water include discharge from industrial facilities where it was made or used and the release of aqueous film-forming foam.

What does this mean?

**People who drink water containing PFBS in excess of the advisory over time could experience problems with their thyroid, kidney, development, as well as cancer. For females, drinking water containing PFBS in excess of the advisory over time may cause developmental delays in a fetus and/or an infant. Some of these developmental effects may persist through childhood.*

** For specific health information, see*
https://www.epa.gov/system/files/documents/2022-06/technical-factsheet-four-PFAS.pdf

What should I do?

- If you have specific health concerns, a severely compromised immune system, have an infant, are pregnant, or are elderly, you may be at higher risk than other individuals and should seek advice from your health care providers about drinking this water.
- You may choose to use a home water filter that is certified to reduce levels of PFBS for drinking and cooking to reduce exposure to PFBS. For more specific information regarding the effectiveness of home water filters for reducing PFBS, visit the National Sanitation Foundation (NSF) International website, http://www.nsf.org/.
- Boiling your water will not remove PFBS.

For more information, see https://www.epa.gov/pfas

What is being done?
[Describe corrective action]. We anticipate resolving the problem within *[estimated time frame].*

[For community water systems, if only one portion of the service area is impacted and you were granted permission from the state to limit the distribution of the public notice, it is highly recommended to include a map of the afflicted area. The system should copy and paste a map below if it elects to include one]

OPTION: Only a portion of our service area, specifically *[AREA]* is affected by this public notice. Please see find a map illustrating the affected area *[attached/enclosed/below].*

For more information, please contact *[name of contact]* at *[phone number]* or *[mailing address]*.

> **Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.**

This notice is being sent to you by *[Public Water System].* PWS ID# NV000_____.
Date distributed: _____.

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

_____ Public Water Systems (PWS ID# NV000____) Has Levels of Hexafluoropropylene Oxide Dimer Acid (GENX Chemicals) Above A Drinking Water Advisory Limit

Our water system recently exceeded the EPA Health Advisory Limit, and as our customers, you have a right to know what happened, what you should do, and what we *[did/are doing]* to correct this situation.

While we routinely monitor for the presence of Federal and State regulated drinking water contaminants, Nevada has not yet adopted a standard, or maximum contaminant level (MCL), for GenX Chemicals.The EPA Health Advisory Limit for GenX Chemicals is 10 parts per trillion (ng/L) and is based on a running annual average (RAA), in which the four most recent quarters of monitoring data are averaged. On *[date]*, we received notice that the sample*(s)* collected on *[date(s)]* showed that our system exceeds the GenX Chemical advisory limit. The RAA for GenX Chemicals based on samples collected over the last year is *[level]* ng/L.

What are GenX Chemicals?

Hexafluoropropylene Oxide (HFPO) Dimer Acid and its Ammonium Salt are known as "GenX Chemicals" due to their association with the GenX processing aid technology. GenX is a trade name for processing agents used to make high thermal and chemical resistance materials within industrial processing. GenX Chemicals are used as replacements for Perfluorooctanoic Acid (PFOA) in the manufacturing of similar end products. Major sources of GenX Chemical in drinking water include discharges from industrial facilities where it was made or used and the release of aqueous film-forming foam.

What does this mean?

**People who drink water containing GenX Chemicals in excess of the advisory over time could experience problems with their liver, kidney, immune system, development (Low birth weight, etc.), as well as cancer. For females, drinking water containing GenX Chemicals in excess of the advisory over time may cause developmental delays in a fetus and/or an infant. Some of these developmental effects may persist through childhood.*

** For specific health information, see*
https://www.epa.gov/system/files/documents/2022-06/technical-factsheet-four-PFAS.pdf

What should I do?

- If you have specific health concerns, a severely compromised immune system, have an infant, are pregnant, or are elderly, you may be at higher risk than other individuals and should seek advice from your health care providers about drinking this water.
- You may choose to use a home water filter that is certified to reduce levels of GenX Chemicals for drinking and cooking to reduce exposure to GenX Chemicals. For more specific information regarding the effectiveness of home water filters for reducing GenX Chemicals, visit the National Sanitation Foundation (NSF) International website, http://www.nsf.org/.
- Boiling your water will not remove GenX Chemicals.

For more information, see https://www.epa.gov/pfas

What is being done?
[Describe corrective action]. We anticipate resolving the problem within *[estimated time frame].*

[For community water systems, if only one portion of the service area is impacted and you were granted permission from the state to limit the distribution of the public notice, it is highly recommended to include a map of the afflicted area. The system should copy and paste a map below if it elects to include one]

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For more information, please contact *[name of contact]* at *[phone number]* or *[mailing address]*.

> **Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.**

This notice is being sent to you by *[Public Water System].* PWS ID# NV000_____.
Date distributed: _____.

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

_____ Public Water Systems (PWS ID# NV000____) Has Levels of Hexafluoropropylene Oxide Dimer Acid (GENX Chemicals) and/or Perfluorobutanesulfonic Acid (PFBS) Above A Drinking Water Advisory Limit

Our water system recently exceeded the EPA Health Advisory Limit, and as our customers, you have a right to know what happened, what you should do, and what we *[did/are doing]* to correct this situation.

While we routinely monitor for the presence of Federal and State regulated drinking water contaminants, Nevada has not yet adopted a standard, or maximum contaminant level (MCL), for GenX Chemicals and/or PFBS.The EPA Health Advisory Limit for GenX Chemicals is 10 parts per trillion (ng/L) and for PFBS 2000 parts per trillion (ng/L) and is based on a running annual average (RAA), in which the four most recent quarters of monitoring data are averaged. On *[date]*, we received notice that the sample*(s)* collected on *[date(s)]* showed that our system exceeds the GenX Chemical and/or PFBS advisory limit. The RAA for GenX Chemicals and/or PFBS based on samples collected over the last year is *[level]* ng/L.

What are GenX Chemicals and PFBS?

Hexafluoropropylene Oxide (HFPO) Dimer Acid and its Ammonium Salt are known as “GenX Chemicals” due to their association with the GenX processing aid technology. GenX is a trade name for processing agents used to make high thermal and chemical resistance materials within industrial processing. GenX Chemicals are used as replacements for Perfluorooctanoic Acid (PFOA) in the manufacturing of similar end products.

Perfluorobutanesulfonic Acid (PFBS) is a member of the group of chemicals called per- and polyfluoroalkyl substances (PFAS), used as a processing aid in the manufacture of fluoropolymers used in non-stick cookware and other products, as well as other commercial and industrial uses, based on its resistance to harsh chemicals and high temperatures. PFBS has been used as a replacement chemical for perfluorooctance Sulfonic acid (PFOS) which has been used in aqueous film-forming foams for firefighting and training, and it is found in consumer products such as stain-resistant coatings for upholstery and carpets, water-resistant outdoor clothing, and greaseproof food packaging.

Major sources of GenX Chemicals and PFBS in drinking water include discharges from industrial facilities where it was made or used and the release of aqueous film-forming foam.

What does this mean?

**People who drink water containing GenX Chemicals and/or PFBS in excess of the advisory over time could experience problems with their liver, kidney, immune system, development (Low birth weight, etc.), as well as cancer. For females, drinking water containing GenX Chemicals and/or PFBS in excess of the advisory over time may cause developmental delays in a fetus and/or an infant. Some of these developmental effects may persist through childhood.*

** For specific health information, see*
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- You may choose to use a home water filter that is certified to reduce levels of GenX and PFBS for drinking and cooking to reduce exposure to GenX Chemicals and/or PFBS. For more specific information regarding the effectiveness of home water filters for reducing GenX Chemicals and/or PFBS, visit the National Sanitation Foundation (NSF) International website, http://www.nsf.org/.
- Boiling your water will not remove GenX Chemicals and/or PFBS.

For more information, see https://www.epa.gov/pfas

What is being done?

[Describe corrective action]. We anticipate resolving the problem within *[estimated time frame].*

[For community water systems, if only one portion of the service area is impacted and you were granted permission from the state to limit the distribution of the public notice, it is highly recommended to include a map of the afflicted area. The system should copy and paste a map below if it elects to include one]

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