COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION HAZARDOUS SITES CLEANUP PROGRAM Middle Spring Creek Site Southampton Townships, Cumberland and Franklin Counties, Pennsylvania ANALYSIS OF ALTERNATIVES AND PROPOSED RESPONSE

The purpose of this Analysis of Alternatives and Proposed Response document is to outline the decision-making process involved in the selection of the proposed response and to provide a description of the proposed response. This document will be included in the Administrative Record which will be compiled for this response pursuant to Section 506 of the Pennsylvania Hazardous Sites Cleanup Act (HSCA), Act of October 18, 1988, P.L. 756 No. 108, 35 P.S. § 6020.506.

The proposed response for the Middle Spring Creek Site (Site) will consist of a prompt interim response to address the threat posed by exposure of residents and businesses to water-supplies contaminated with per- and polyfluoroalkyl substances (PFAS), specifically perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), perfluorononanoic acid (PFNA), and perfluorohexanesulfonic acid (PFHxS) above established maximum contaminant levels (MCLs). This action is taken to protect the public health, safety, and welfare.

I. SITE INFORMATION

A. Site Location and Description

The Middle Spring Creek Site (Site) is located in Southampton Township, Cumberland and Franklin Counties, Pennsylvania. Middle Spring Creek runs through the city of Shippensburg. The Site is found on the United States Geological Survey 7.5-minute Shippensburg, Pennsylvania topographic map at approximately 40° 4' 12.36" north latitude and 77° 32' 20.7" west longitude. The investigation area includes, but is not limited to, properties approximately within a 0.5-mile radius of the previously stated latitude and longitude.

Middle Spring Creek is a spring-fed trout stream that has been stocked with trout in the past. A fish hatchery once operated in the vicinity of Fish Hatchery Road. The surrounding area is primarily used for agriculture with several small retail and residential locations in the vicinity.

B. Site History

In August 2023, surface water sample results were provided to the Pennsylvania Department of Environmental Protection (DEP) by Pennsylvania American Water. The notification indicated that the water in Middle Spring Creek was impacted by PFOA and PFOS detections up to 29 and 156 nanograms per liter (ng/L), respectively. Middle Spring Creek was sampled by DEP in November 2023 in some of the same areas previously sampled by Pennsylvania American Water. Concentrations of PFOS were as high as 104.6 ng/L, PFOA as high as 20.7 ng/L, perfluorobutanesulfonic acid (PFBS) as high as 6 ng/L, and PFHxS as high as 7.9 ng/L. Perfluorohexananoic acid (PFHxA) was also detected.

A second round of surface water sampling in Middle Spring Creek was conducted by DEP in May 2024. PFOS concentrations were as high as 562.4 ng/L, PFOA concentrations were as high as 89.8 ng/L, PFBS concentrations were as high as 16 ng/L, and PFHxS as high as 30 ng/L. Additional PFAS compounds were detected including perfluorononanoic acid (PFNA), perfluoroheptanoic acid (PFHpA), and PFHxA.

In August 2024, drinking water was sampled in residences in the vicinity of Fish Hatchery Road. Five residences were sampled and four residences had PFOS concentrations ranging from 9.7 ng/L to 5,943.5 ng/L, PFOA concentrations ranging from 38.2 ng/L to 1,795.3 ng/L, PFHxS concentrations ranging from 18.5 ng/L to 623.7 ng/L, PFNA concentrations ranging from 4 ng/L to 112.6 ng/L, and PFBS concentrations ranging from 3.4 ng/L to 137.8 ng/L.

On September 11, 2024, four additional residences were sampled and three were found to have PFAS contamination. The results showed PFOS concentrations as high as 1,771.9 ng/L, PFOA concentrations as high as 487.1 ng/L, PFHxS concentrations as high as 187.3 ng/L, PFNA concentrations as high as 30.6 ng/L, and PFBS concentrations as high as 38.6 ng/L.

At this time, the source and full extent and degree of contamination is not known.

On October 14, 2024, DEP began providing potable water to residents with impacted wells. DEP will continue to procure and deliver additional bottled water to meet the needs of the residents until a final response action has been implemented.

C. Release of Contaminants or Hazardous Substances - PFAS

The compounds identified above are considered "contaminants" or "hazardous substances" as those terms are defined by Section 103 of HSCA, 35 P.S. § 6021.103.

PFAS represents a large class of man-made synthetic chemicals that include over 6,000 compounds. PFAS are considered emerging contaminants as they are potentially linked to a number of adverse health effects, including high cholesterol, developmental effects including low birth weight, liver toxicity, decreased immune response, thyroid disease, kidney disease, ulcerative colitis and certain cancers, including testicular cancer and kidney cancer.

Originally created in the 1930s and 1940s, PFAS have been widely used in industrial and manufacturing applications due to their unique combination of water repellence, stain resistance, friction reduction, and heat resistance properties. PFAS are found in many industrial and consumer products such as clothing, carpeting, upholstery, food packaging, non-stick cookware, fire-fighting foam, personal care products, paints, adhesives, and metal plating coatings. Because of their chemical structure, PFAS readily dissolve in water, are very mobile, persist in the environment, and bioaccumulate in living organisms over time.

Section 4 of the Pennsylvania Safe Drinking Water Act (SDWA), 35 P.S. § 721.4, grants the Pennsylvania Environmental Quality Board (Board) the authority to adopt rules and regulations governing the provision of drinking water to the public, and section 1920-A of the

Administrative Code of 1929, 71 P.S. § 510-20, authorizes the Board to promulgate rules and regulations necessary for the performance of the work of DEP.

On April 10, 2024, the United States Environmental Protection Agency published a final National Primary Drinking Water Regulation (NPDWR) for six PFAS. This NPDWR established MCLs for regulated drinking water sources as 4 ng/L for both PFOA and PFOS, 10 ng/L for both PFHxS and PFNA, and 2,000 ng/L for PFBS. 89 Fed. Reg. 32532 (April 10, 2024). See also 40 C.F.R. § 141.61(c)(2). As of June 25, 2024, these MCLs became effective and were subsequently adopted as Pennsylvania MCLs, by reference. See 89 Fed. Reg. 32532 (April 10, 2024); 25 Pa. Code § 109.202(a)(2). Exposure to concentrations of PFOA, PFOS, PFHxS, PFNA, and PFBS above their respective MCLs poses a threat to human health when ingested in water. These concentrations have also been established as the Medium Specific Concentrations (MSCs) for PFOA, PFOS, PFHxS, PFNA, and PFBS in groundwater by DEP's Land Recycling Program. See 25 Pa. Code § 250.304(c). Pennsylvania does not currently have surface water quality criteria for PFAS compounds.

II. RESPONSE CATEGORY

DEP implemented a prompt interim response at this Site to protect public health and safety. This determination was based upon the following conditions that exist at the Site: (1) The continued release and/or presence of PFAS, specifically PFOA, PFOS, PFHxS, PFNA, and PFBS in the groundwater; and (2) The actual human exposure to PFAS via ingestion because the PFAS contaminated groundwater at the Site serves as a source of drinking water for certain residential/commercial water supplies in the vicinity.

An Interim response is defined under HSCA as a "[r]esponse which does not exceed 12 months in duration or \$2,000,000 in cost." 35 P.S. §6020.103. An interim response may exceed these limitations when there is an "immediate risk to public health, safety or welfare or the environment" among other reasons Id. Under section 505(b) of HSCA, DEP may implement an interim response, "before development of an administrative record when, upon the basis of the information available to the department at the time of the interim response, there is a reasonable basis to believe that prompt action is required to protect the public health or safety or the environment." 35 P.S. § 6020.505(b). A prompt interim response is justified in order to address the immediate human health risks posed by the PFOA, PFOS, PFHxS, PFNA, and PFBS contamination in these water supplies.

This response does not address active remediation of the groundwater contamination because plume sources and boundaries have not been identified, and in-situ treatment for PFAS is not currently available. Sampling of residential water supplies in the area of the Site will continue to determine any additional exposure to the contaminated groundwater. Further investigation and evaluation will be conducted to determine the source of the contamination, extent of contamination, and to assess if further response actions may be necessary.

III. CLEANUP STANDARDS

This response is not a final remedial response pursuant to HSCA Section 504, 35 P.S. § 6020.504, and, therefore, is not required to meet standards that apply to a final remedial response. Further investigation has been initiated to determine the source(s) and extent of the groundwater, surface water and soil contamination. Additional response actions may be needed to achieve a complete and final cleanup for the Site.

The SDWA, 35 P.S. §§ 721.1-721.17, and the Pennsylvania Drinking Water Regulations, 25 Pa. Code §§ 109.1-109.1413, promulgated thereunder provide MCLs that specify the maximum permissible levels of contaminants in finished water produced by public water systems. See 25 Pa. Code § 109.3, 109.202. MCLs are numerical limits for selected contaminants such that their presence in drinking water-supplies does not pose adverse effects on their users. 25 Pa. Code § 109.1. As noted above, the MCLs for PFOA and PFOS are 4 ng/L, PFHxS and PFNA are 10 ng/L, and PFBS are 2,000 ng/L, respectively. See 40 C.F.R. § 141.61(c)(2); 25 Pa. Code § 109.202(a)(2).

The MCLs are used to establish cleanup standards for groundwater under the Pennsylvania Land Recycling and Environmental Remediation Standards Act (herein after Act 2), 35 P.S. §§ 6026.101-6026.908, and its attendant regulations contained in 25 Pa Code §§ 250.1-250.708. Environmental cleanup or remediation standards established under Act 2 are applicable to remediation conducted under HSCA. See 35 P.S. § 6026.106(a). Specifically, Act 2 site-specific cleanup regulations provide that "[d]rinking water use of groundwater shall be made suitable by at least meeting the primary and secondary MCLs at all points of exposure." See 25 Pa. Code § 250.403(c).

IV. APPLICABLE, OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

The following standards, requirements, criteria, or limitations are legally ARARs under the circumstances presented by the Site.

Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law, that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a state Site. The "applicability" determination is a legal one and implies that the remedial action or the circumstances at the site satisfy all the jurisdictional prerequisites of a requirement.

Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that while not "applicable' to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a state site, address problems or situations sufficiently similar to those encountered and their use is well suited to the particular site.

The determination of relevant and appropriate relies on professional judgment. A requirement can be judged by comparing several factors, including the characteristics of the remedial action, the hazardous substances in question, or the physical circumstances of the site, with those addressed in the requirement. It is also helpful to look at the objective and origin of the requirement.

A requirement that is determined to be relevant and appropriate must be complied with to the same degree as if it were applicable. However, there is more discretion by DEP in this determination. It is possible for only part of a requirement to be considered relevant and appropriate, the rest being dismissed, if judged not to be relevant and appropriate in a given case.

Non-promulgated or non-regulatory documents (health advisories, guidance, proposed regulations), issued by the state or federal government, are not considered ARARs and are referred to as "to be considered" requirements or TBCs. TBCs are evaluated along with ARARs and are considered- appropriate in the absence of a specific ARAR or where ARARs are not sufficiently protective in developing cleanup goals. A TBC identified for the action must be complied with to the same degree as if it were applicable.

ARARs

Code of Federal Regulations, 40 CFR Part 141

The Pennsylvania Constitution, Article 1, § 27.

Land Recycling and Environmental Remediation Standards Act, Act of May 19, 1995, P.L. 4, No. 1995.2, 35 P.S. §§ 6026.101-6026.908.

Administration of the Land Recycling Program, 25 Pa. Code Chapter 250, Subchapter D (Sitespecific Standards).

Subchapter D – Site-specific Standard Section 250.402 – Human health and environmental protection goals Section 250.403 – Use of groundwater Section 250.404 – Pathway identification and elimination

The Pennsylvania Solid Waste Management Act, Act of July 7, 1980, P.L. 380, No. 97, as amended, 35 P.S. §§ 6018.101-6018.1003.

Residual Waste Management Regulations, 25 Pa. Code Chapters 287-299.

Pennsylvania Safe Drinking Water Act, Act of May 1, 1984, P.L. 206, 35 P.S. §§ 721.1-721.17.

Pennsylvania Drinking Water Regulations, 25 Pa. Code Chapter 109.

Section 109.201 – Authority Section 109.202 – State MCLs and treatment technique requirements Pennsylvania Hazardous Sites Cleanup Act, Act of October 18, 1988, 35 P.S. §§ 6020-101 – 6020.1305.

Pennsylvania Uniform Environmental Covenant Act, Act of December 18, 2007. 27 Pa. C.S. §§ 6501-6517.

TBCs

Guidance for Commonwealth-Funded water Supply Response Actions, November 21, 2015 (262-5800-001)

Standard Operating Procedure for the Hazardous Sites Cleanup Program, HSCA Handbook, January 2022.

V. ANALYSIS OF ALTERNATIVES

Alternative 1. No Action:

This alternative was developed as a baseline against which other remedial alternatives can be compared. This alternative involves taking no action to remove, remediate, or contain the contaminated groundwater or reduce threats to human health at the Site. Risks posed by ingestion of water from contaminated private-water supplies would remain. This alternative would not comply with ARARs for groundwater contamination. Alternative 1 is feasible and implementable. There is no cost to DEP for Alternative 1.

Alternative 2. Provision of Bottled Water and Institutional Controls:

Seven wells serving local residents have been identified as containing PFOS, PFOA, PFNA, and/or PFHxS above their respective MCLs. Currently, three households have agreed to receive potable water. Starting October 14, 2024, DEP began providing bottled water to residents. DEP will continue to provide bottled water until a final response action has been implemented.

As the investigation continues, additional properties with residential/commercial wells/springs may be identified that exceed one or more MCLs for PFAS. If such a situation occurs, DEP would also provide bottled water to each of these impacted private-well/spring owners. DEP will continue to monitor known impacted wells at least twice a year to establish contaminant trends.

Alternative 2 would reduce the risk posed by ingestion of water above the MCL. This alternative would reduce the negative health impact of using the contaminated groundwater for private water-supplies and thus provide increased protection of human health. The alternative does not eliminate all PFAS risk as the supplier of bottled water is not currently required to test for PFAS or reduce PFAS concentrations. DEP would sample and analyze the source of the bottled water once per year for PFAS.

Should this alternative be selected as a final response action, then the property owners would be responsible for the continued cost and supply of bottled water. In addition, DEP would implement activity and use limitations (AULs) either through environmental covenants or administrative orders. Environmental covenants or administrative orders would be placed on deed records that would alert new property owners, and prospective property purchasers, of the health risks for continued use of contaminated private water-supplies. Contamination would remain in the underlying aquifer and would continue to pose threats to groundwater users. This alternative would comply with the applicable requirements of the Site-specific cleanup standard under the Land Recycling and Environmental Remediation Standards Act requiring institutional controls.

The present cost of supplying bottled water under Alternative 2 for three households (14 residents is $7,000 (14 \times 250 + 3,000 + 500)$).

Alternative 2	Annual	Annual Sampling	Multiplier	Total Costs
	Water Costs	Costs		
Bottled Water	\$250 /		14 x 1 year	\$ 3,500
	resident			
Monitoring		\$1,000	3 units x 1	\$ 3,000
_			year	
Bottled Water		\$ 500	1 x 1 year	\$ 500
Supplier Analysis				

Alternative 3. Installation of Point of Entry Treatment (POET) System:

This alternative was considered and rejected as a prompt interim response for the residences since they could not be implemented in a timely manner. POET systems may be considered in future responses as the investigation continues. This alternative provides for the Department to install treatment systems on the supply line of private wells that are contaminated. The Department will provide continuing laboratory monitoring of these systems and provide maintenance of these units until a final remedial decision for the site. This is not a permanent solution and would require continued actions by the Department to monitor and operate the units. The remedy would need to be continued until the Department completes an investigation of the area to determine the possible source of contamination and final remediation alternatives. If the Department determines that this is a final response, the operation, maintenance, and monitoring of the POET system would become the responsibility of the property owner under an environmental covenant or other restrictive document. The treatment systems would effectively remove the risk posed by ingestion, inhalation, and dermal contact. This alternative would be protective of human health and the environment. Currently, there are seven residences that would need treatment. Initial installation of a treatment system is estimated to cost \$4,500 per unit. Annual maintenance on each treatment system is estimated at \$1,500. Sampling and analytical monitoring costs are estimated at \$1,000 a year per system.

VI. PROPOSED RESPONSE

DEP has selected Alternative 2 as the Prompt Interim Response for residences and businesses with private-water supplies determined to have PFOA and PFOS contamination levels greater than 4 ng/L, and PFHxS and PFNA greater than 10 ng/L and PFBS greater than 2,000 ng/L. Bottled water will be offered to those utilizing unregulated private residential water-supplies that contain contamination above the MCLs for PFAS for which an MCL exists. DEP will provide bottled water until a final response action has been implemented.

Investigation of the Site will continue to determine the source(s) of contamination, the extent of contamination, and if further response actions are necessary.

VII. DEP APPROVALS

FOR THE COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Robert M. DiGilarmo, Regional Director

12/12/2024

Date