COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ENVIRONMENTAL CLEANUP & BROWNFIELDS

April 26, 2023

(484) 250-5960

Subject: Analysis of Alternatives and Proposed Response
Boyertown Landfill Site
Douglass Township, Montgomery County

To: Patrick L. Patterson, Regional Director
Pennsylvania Department of Environmental Protection
Southeast Regional Office

From: Timothy Cherry, Solid Waste Supervisor
Hazardous Sites Cleanup Program
Southeast Regional Office

Attached is the Analysis of Alternatives and Proposed Response for the Boyertown Landfill Site.

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Environmental Cleanup & Brownfields
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Ragesh R Patel Digitally signed by Ragesh R Patel Date: 2023.05.05 09:24:27 -04'00'

_____ Concur _____ Date

_____ Do not Concur _____ Date

Bonnie McClennen, Manager
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Bonnie McClennen Digitally signed by Bonnie McClennen Date: 2023.04.26 09:23:47 -04'00'

_____ Concur _____ Date

_____ Do not Concur _____ Date

COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Protection
Hazardous Sites Cleanup Program

Boyertown Landfill Site
Douglass Township, Montgomery County

Prompt Interim Response

ANALYSIS OF ALTERNATIVES AND PROPOSED RESPONSE

The purpose of this Analysis of Alternatives and Proposed Response document issued under the Pennsylvania Hazardous Sites Cleanup Act, Act of October 18, 1988, P.L. 756, *as amended*, 35 P.S. § 6020.101-6020.1305 ("HSCA"), 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 HSCA, 35 P.S. § 6020.506.

The Pennsylvania Department of Environmental Protection ("DEP") is proposing a Prompt Interim Response to alleviate the threat to public health and safety posed by the release of per- and polyfluoroalkyl substances ("PFAS") at the Boyertown Landfill HSCA Site ("Site") in Douglass Township. Several PFAS have been detected in landfill leachate, drinking water, groundwater, and surface water at the Site. To date, one PFAS, perfluorooctanoic acid ("PFOA"), has been detected in potable wells at a concentration exceeding Pennsylvania's Maximum Contaminant Level ("PA MCL") promulgated pursuant to the Pennsylvania Safe Drinking Water Act on January 14, 2023[1].

This proposed response involves the installation and maintenance of point-of-entry treatment systems ("POET systems") to alleviate the threat to people posed by PFAS-contaminated groundwater used for potable purposes that exceed PA MCLs for PFOA and/or perfluorooctanesulfonic acid ("PFOS") as well as any future federal[2] or Pennsylvania Maximum Contaminant Levels for PFAS that may be promulgated pursuant to the federal or Pennsylvania Safe Drinking Water Acts ("drinking water standards"). Bottled drinking water is being provided to impacted property owners until installation of the POET systems is completed. DEP would continue to sample and maintain the POET systems while it further evaluates drinking water and the optimal long-term response(s) to ensure potable wells at the Site meet the drinking water standards ("drinking water investigation").

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[1] See 25 Pa. Code Chapter 109, the Safe Drinking Water MCL Rule [55 PaB.333]
[2] The United States Environmental Protection Agency ("USEPA") is in the process of developing MCLs for PFOA and PFOS under the federal Safe Drinking Water Act (42 U.S.C. §300f et seq.)

I. SITE INFORMATION

A. Site Location and Description

The Site is compromised of the Boyertown Sanitary Disposal Landfill ("Landfill") located at 300 Merkel Road, Douglass Township, Montgomery County, and the surrounding area, which consists of residential properties, an apartment complex, a few commercial properties, as well as agricultural land.

The Landfill covers approximately thirty (30) acres and includes a leachate treatment system and leachate and stormwater lagoons. A residential development on the southern boundary of the landfill is served by public water, while properties to the north, east, and west of the Landfill rely on potable wells.

B. Site History

The Landfill received municipal, residual, and hazardous wastes from the 1960s until 1985. DEP, then the Department of Environmental Resources, denied an expansion request by the Landfill, and the Landfill ceased lawful operations. The Landfill was capped with a combination of low-permeability clay and two feet of soil in 1987. The Landfill owner was required to perform operations and maintenance of the Landfill pursuant to the regulations of the Pennsylvania Solid Waste Management Act, Act of July 7, 1980, P.L. 380, as amended, 35 P.S. §§ 6018.101 -6018.1003 ("SWMA").

Between 2001 and 2015, DEP performed several activities to address inadequate operations and maintenance ("O&M") and acute issues at the Landfill, including sampling of the Landfill's monitoring wells and the 2003 installation of a leachate/landfill gas interception trench along the southern boundary of the Landfill to reduce the presence of leachate outside the southern boundary of the Landfill.

To ensure future adequacy of the performance of O&M at the Landfill, in 2012 DEP issued notice letters to Potentially Responsible Parties ("PRPs") based on available records. In 2014, a PRP Group, the Boyertown Sanitary Landfill Site Coalition ("Coalition"), consisting of 20 of the largest contributors of waste to the landfill, was established. Starting in 2015, the Coalition's consultant began sampling the Site's monitoring wells and added several additional monitoring wells on and in the vicinity of the Site. In 2017, the Coalition's consultant prepared a report outlining needed repairs at the Site.

In May 2019, DEP sampled the Landfill's leachate at the Site for PFAS. The sample results indicated that PFAS was present, and the combined concentrations of PFOA and PFOS exceeded the 2016 United States Environmental Protection Agency lifetime Health Advisory Levels ("2016 USEPA HALs") for PFOA and PFOS in the raw leachate, the raw leachate lagoon, the treated leachate lagoons, and in water seeping from the Site into Minister Creek. These exceedances led DEP to sample more than thirty (30) potable wells located at or near the Site in 2019 and 2020. Only the Landfill's potable well exceeded the 2016 USEPA HALs. In 2020 and 2022, DEP sampled monitoring wells at the Site, and the results indicated that PFOA and PFOS were present in groundwater above the 2016 USEPA HALs.

In November 2022, DEP began providing bottled water as an interim measure to homes at the Site where concentrations of PFOA and/or PFOS exceeded the then draft final PA MCLs. To date, six (6) residential properties have exceeded the PA MCLs.

C. Release of Hazardous Substances and Contaminants

PFAS are a large class of human made fluorinated chemicals, widely used in consumer and industrial products, including stain-resistant carpeting and food packaging. PFAS are reasonably assumed to have been disposed of at the Landfill during its period of operation. They do not occur naturally in the environment. Several PFAS, including PFOA and PFOS, are "contaminants," as that term is defined in Section 103 of the HSCA, 35 P.S. § 6020.103.[3] The presence of these in groundwater constitutes a "release" and "threatened release" of contaminants at the Site, as those terms are defined in Section 103 of HSCA, 35 P.S. § 6020.103, and/or used in Section 505 of HSCA, 35 P.S. § 6020.505, which presents a substantial danger to the public health or safety and/or the environment.

According to Pennsylvania's January 14, 2023 Notice in the *Pennsylvania Bulletin* regarding the Safe Drinking Water PFAS MCL Rule, "PFAS are considered emerging contaminants because research is ongoing to better understand the potential impacts PFAS pose to human and animal health and the environment. PFAS 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."

II. RESPONSE CATEGORY

DEP proposes a Prompt Interim Response at this Site to protect public health and safety. DEP has the authority to conduct an Interim Response as defined in Section 103 of HSCA, 35 P.S. § 6020.103, to alleviate the threat to public health and safety caused by PFAS exceeding drinking water standards in potable wells. Several potable wells that have exceedances of the drinking water standards are currently receiving bottled water, and the time and cost to install the POET systems would be less than the time and costs it would take to develop and close an Administrative Record. The proposed response will cost less than $2,000,000 but will continue for the duration of DEP's drinking water investigation of the Site.

Pursuant to Section 103 of HSCA[4] an interim response may exceed the twelve-month limitation only where one of the following applies:

(1) Continued response actions are immediately required to prevent, limit or mitigate an emergency.
(2) There is an immediate risk to public health, safety or welfare or the environment.
(3) Assistance will not otherwise be provided on a timely basis.

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[3] In September 2022, EPA proposed to designate PFOA and PFOS as hazardous substances pursuant to the Federal Superfund Act, officially titled the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), 42 U.S.C. § 9601 et seq.
[4] See Section 103 of HSCA, 35 P.S. § 6020.103

(4) Continued response action is otherwise appropriate and consistent with a future remedial response to be taken.

DEP has determined that there is an immediate risk to public health, safety or welfare or the environment and continued response action is otherwise appropriate to be taken by the DEP or other potentially responsible parties.

III. CLEANUP STANDARDS

This proposed response is not a final remedial response as that term is used in Section 504 of HSCA, 35 P.S. 6020.504, and therefore is not required to meet the cleanup standards which apply to final remedial responses. Additional response actions may be proposed by DEP or other responsible parties to address conditions at the Site.

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

The table in Appendix A lists the standards, requirements, criteria, or limitations that are legally applicable, or relevant and appropriate under the circumstances presented by this 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 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. Consideration is given to 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 which may include health advisories, guidance documents, and 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.

V. ANALYSIS OF ALTERNATIVES

In order to achieve the objective of eliminating the threats posed by PFAS exceeding the drinking water standards, DEP considered the following potential alternatives:

1. No Action.
2. Continued Delivery of Bottled Water.
3. Installation and Maintenance of POET systems.

ALTERNATIVE 1: No Action

Description of the Alternative
No action is a baseline alternative, to which all other alternatives are compared. DEP would take no further action at the Site, including discontinuation of the delivery of bottled water. This alternative would not eliminate the threats to the public health and safety due to the continued exposure of PFAS in potable wells. This alternative would be feasible and implementable because no action is being taken but would not be effective in addressing the health threats to the public and does not offer a permanent solution.

Compliance with ARARs
This alternative would not comply with ARARs. People would be exposed to concentrations of PFAS that exceed the drinking water standards.

Cost Effectiveness:
There is no cost associated with this alternative.

ALTERNATIVE 2: Continued Delivery of Bottled Water

Description of the Alternative
DEP would continue to supply bottled water to properties exceeding PA MCLs for PFOA and/or PFOS for the duration of DEP's ongoing drinking water investigation. DEP would also continue to sample residential properties in the surrounding area during its ongoing investigation of the drinking water. If necessary, bottled water would be provided to any additional residence with concentrations of PFOA and/or PFOS exceeding PA MCLs.

This alternative would be protective of human health so long as residents use bottled water for drinking and cooking. This alternative is feasible and largely implementable but would present an inconvenience to the residents because of scheduling, and the need for residents to lift, store, and move cases of water. The implementability of this alternative would be limited during adverse weather events, logistical constraints caused by supply-chain distributions, and other

unforeseeable disruptions in service. This alternative would not be protective against incidental ingestion of the untreated water supply. This alternative is not a permanent solution.

Compliance with ARARs
This alternative would comply with ARARs because the bottled water that DEP uses to supply affected residential properties does not contain PFAS above the drinking water standards.

Cost Effectiveness
The costs for each property exceeding the drinking water standards is broken-down as follows:

1) Approximately $1,800 annually for bottled water deliveries.
2) Approximately $400 for annual sampling to monitor PFAS concentrations, to determine if concentrations continue to exceed the drinking water standards.

Assuming six (6) impacted properties, the Site-wide costs for Alternative 2 for three (3) years are:

Year 1: $13,200
Year 2: $13,200
Year 3: $13,200

Alternative 2 is considered a cost-effective alternative.

ALTERNATIVE 3: Installation and Maintenance of POET Systems

Description of the Alternative
DEP would install, at DEP's expense, POET systems that would remove the PFAS to achieve the drinking water standards before the water entered a building's distribution system. This would ensure all points of use with contaminated groundwater would be treated, preventing accidental exposure. The POET systems are conceptualized as dual canister granulated activated carbon filtration systems with sample ports allowing for pre, mid, and post POET system sampling. During the implementation of the response, the design and components of POET systems may be changed to meet the specific requirements of individual locations.

For the duration of DEP's drinking water investigation, DEP would:

1) Sample to ensure the POET systems are functioning properly;
2) Perform maintenance of the POET systems, as necessary;
3) Continue to supply bottled water until sample results demonstrate that each POET system is reducing PFAS concentrations below the drinking water standards;
4) Install additional POET systems, as necessary, on any additional homes that are found to exceed the drinking water standards.

This alternative would effectively eliminate the ingestion pathways of PFAS exceeding drinking water standards in groundwater used for potable purposes. This alternative also allows DEP to quickly expand and implement this response should additional properties be identified as having exceedances of the drinking water standards during DEP's drinking water investigation.

Compliance with ARARs
This alternative would comply with ARARs. DEP would ensure that the POET system components would comply with material standards incorporated in regulations issued pursuant to the federal Safe Drinking Water Act and the Pennsylvania Safe Drinking Water Act. Although drinking water quality in private wells is not regulated by the federal Safe Drinking Water Act or the Pennsylvania Safe Drinking Water Act, the drinking water standards are relevant and appropriate criteria for the assessment of drinking water quality at the Site.

Cost Effectiveness
The costs for each property exceeding the drinking water standards is broken-down as follows:

1) Approximately $4,000 for the purchase and installation of each POET system.
2) Approximately $1,000 per performance sampling event (proposed as: immediately after POET system installation, 6-month after POET system installation, and annual sampling thereafter).
3) Approximately $200 for maintenance annually.

Assuming 6 impacted properties, the Site-wide costs for Alternative 3 for three (3) years are:

Year 1: $37,200
Year 2: $7,200
Year 3: $7,200

Alternative 3 is considered a cost-effective alternative.

VI. PROPOSED RESPONSE

DEP has determined, based upon the information contained in this document, that a Prompt Interim Response is justified at the Site in accordance with Section 505(b) of the HSCA, 35 P.S. § 6020.505(b). DEP proposes the selection of Alternative 3: Installation and Maintenance of POET Systems because it will provide for a protective, timely, and cost-effective response for the long term. The proposed response, Alternative 3, affords substantially more protection to human health than Alternatives 1 and 2, because it eliminates exposure to the PFAS in groundwater. The proposed response abates the threat to human health from ingestion of water containing PFOA and PFOS above the drinking water standards while allowing for the continued drinking water investigation of the Site. The proposed alternative will comply with ARARs. The proposed response provides flexibility so that additional systems may be installed if subsequent sampling identifies properties where concentrations of PFOS and PFOA in residential privately owned potable wells exceed the drinking water standards. DEP will continue to monitor the performance of the POET systems at the residential properties where the systems are installed as part of its ongoing investigation of the Site, with long-term operation and maintenance costs of Alternative 3 being significantly lower than the costs of Alternative 2.

VII. DEP APPROVALS

FOR THE COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Patrick L. Patterson, Regional Director
Southeast Regional Office

5-9-23
Date

APPENDIX A: ARARS TABLE

Boyertown Landfill Site
Appendix A: ARARs Table

ARARs	Citation/ Reference	Description	Chemical	Action	Status	Applicability to Proposed Remedial Actions
Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA")	42 U.S. Code § 9601 *et seq.*	The Federal Superfund program, administered by the US EPA, is designed to investigate and clean-up sites contaminated with hazardous substances	X		Relevant & Appropriate	Provides definitions of contaminant and pollutant as referenced in HSCA Section 103.
Hazardous Sites Cleanup Act (Act 108)	35 P.S. § 6020.101 *et seq.*	Provides means for funding and enforcement at response and remediation cleanups.	X	X	Applicable	An Interim Response action is being proposed in accordance with HSCA. Defines contaminant.
Guidance for Commonwealth-Funded Water Supply Response Actions, November 21, 2015.	Document Number: 262-5800-001.	Outlines implementation of Commonwealth-funded water supply responses, including procedures for providing temporary or permanent response actions for impacted private water supplies.		X	TBC	• Explains operation and maintenance duties of response actions, including the appropriate parties that should conduct such activities.
PA Safe Drinking Water Act, Act of May 1, 1984, P.L. 206	35 P.S. § 721.1 *et seq.*	Sets forth drinking water quality standards at least as stringent as federal standards: Maximum Contaminant Levels ("MCLs").	X		Relevant & Appropriate	Residential wells are impacted above MCLs. Post treatment samples will achieve MCLs.
Safe Drinking Water, Chapter 109	25 Pa. Code § 109 *et seq.*					
Environmental Accreditation Act 90 of 2002	27 Pa. C.S. §§ 4101-4113	Establishes PA's Laboratory accreditation program	X		Applicable	Facilities that test or analyze environmental samples will need to be accredited.
Environmental Laboratory Accreditation	25 Pa. Code Chapter 252					