RELATIVE RISK SITE EVALUATION

Springfield-Beckley Air National Guard Base, Ohio

Introduction

The Department of Defense (DoD) identified certain per- and polyfluoroalkyl substances (PFAS) as emerging contaminants of concern which affected installations across the Air Force. When the term "Air Force" is used in this fact sheet, it includes Air National Guard (ANG). Specifically, perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and perfluorobutanesulfonic acid (PFBS) are components of legacy Aqueous Film Forming Foam (AFFF) that the Air Force began using in the 1970s as a firefighting agent to extinguish petroleum fires. The U.S. Environmental Protection Agency (EPA) issued lifetime drinking water Health Advisories (HA) for PFOS and PFOA, and health-based regional screening levels for PFBS.

The Air Force has systematically evaluated potential AFFF releases on all Installations and former Installations. It began with the Preliminary Assessments, or PAs, that identified potential release areas. First responders, fire chiefs, and hangar staff were interviewed to determine where a release or a spill may have occurred on an Installation (for example, aircraft crash site or an accidental hangar AFFF release). Once the information in the PA was collected, we began Site Inspections, or SIs, to take soil and water samples and analyzed the media for PFAS compounds at the potential release areas. The intention of the SI was to determine if a release had occurred and to determine the impacts to soil and/or groundwater. The next step in the process is called the Relative Risk Site Evaluation, or RRSE, which is a tool used to sequence Sites/Installations to begin a Remedial Investigation, or RI. Air Force Installations are at the beginning of the more detailed investigative stage, the RI, to determine where action is needed and to identify remedial technologies.

The Springfield-Beckley Air National Guard Base (ANGB) PFAS PA and SI can be found at the Air Force Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Administrative Record (AR): https://ar.afcec-cloud.af.mil/ Scroll to the bottom of the page and click on "Continue to site", then select Air National Guard (e.g., Active, ANG, BRAC), scroll down the Installation List and click on Springfield-Beckley Municipal Airport, OH, then enter the AR Number 473544 in the "AR #" field for the PA. For the SI, enter the AR Number 593172. Then click "Search" at the bottom of the page. Click on the image of the eye to view the document.

More information on the Air Force response to PFOS and PFOA can be found at: https://www.afcec.af.mil/WhatWeDo/Environment/Perfluorinated-Compounds/

Acronyms

AFFF - Aqueous Film Forming Foam

ANG - Air National Guard

ANGB - Air National Guard Base

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act

CHF – Contaminant Hazard Factor

DoD - Department of Defense

EPA – US Environmental Protection Agency

FTA – Fire Training Area

HA – Health Advisory

MPF – Migration Pathway Factor

PA – Preliminary Assessment

PFAS - Per-and polyfluoroalkyl substances

PFBS – Perfluorobutanesulfonic acid

PFOA - Perfluorooctanoic acid

PFOS - Perfluorooctane sulfonate

PRL - Potential Release Location

RF – Receptor Factor

RI – Remedial Investigation

RRSE – Relative Risk Site Evaluation

SI – Site Inspection

RELATIVE RISK SITE EVALUATION, cont.

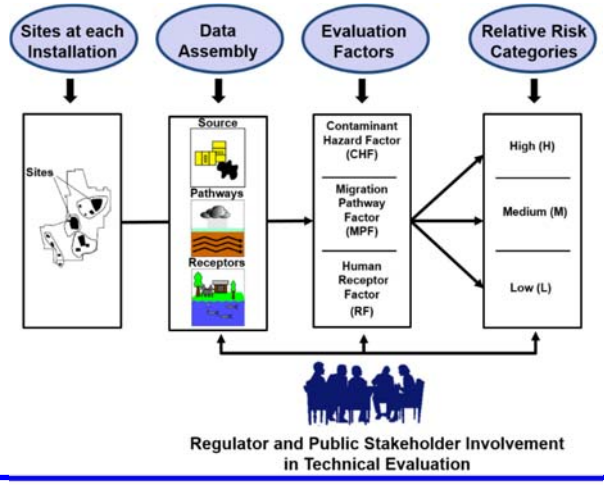
Q. What is the Relative Risk Site Evaluation (RRSE)?

A. RRSE is a methodology to sequence environmental restoration work used by the DoD. The RRSE process is used to evaluate the relative risk posed by an environmental restoration site in relation to other sites. The DoD fundamental premise in site prioritization is "worst first," meaning the DoD Component shall address sites that pose a relatively greater potential risk to public safety, human health, or the environment before sites posing a lesser risk. Relative risk is not the sole factor in determining the sequence of environmental restoration work, but it is an important consideration in the priority setting process. The methodology is described in the DoD, Relative Risk Site Evaluation Primer, Summer 1997 Revised Edition: https://denix.osd.mil/references/dod/policy-guidance/relative-risk-site-evaluation-primer/

Q. What is the RRSE framework?

A. The RRSE framework provides a DoD-wide approach for evaluating the relative risk to human health and the environment posed by contamination present at sites. The **Relative Risk Site Evaluation Concept Summary** (shown in the figure) illustrates the selection of sites, evaluation of the site data using three evaluation factors, and placement into high, medium, and low categories. The relative risk site evaluation framework is based on information fundamental to risk assessment: sources, pathways, and receptors to sequence restoration work. The RRSE is not a baseline risk assessment or health assessment in the CERCLA process. Regulators and public stakeholders in the environmental restoration process are provided the opportunity to participate in the process in accordance with the DoD Defense Environmental Restoration Program.

Relative Risk Site Evaluation Concept Summary

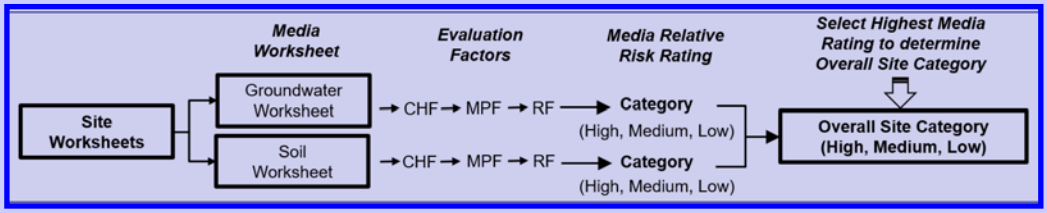


Sites at Each Installation

Q. What restoration sites are required to be evaluated in the RRSE process?

A. Restoration sites in CERCLA phases prior to remedy-in-place are evaluated in the process. Worksheets are developed for environmental media at each site. For consistency across all the Installations, only surface soil (0-1 foot deep) and groundwater media were evaluated in the RRSE.

The figure shows the process for a media to be evaluated using the contaminant hazard factor (CHF), the migration pathway factor (MPF), and the receptor factor (RF). Each media is scored to obtain a relative risk rating of High, Medium, or Low. The highest media rating determines the Overall Site Category.



Q. How is the Contaminant Hazard Factor (CHF) determined?

A. The **CHF** is determined by dividing the maximum level for a contaminant at each site by the approved screening values (i.e., risk-based comparison values). Contaminant concentration ratios are totaled to arrive at a **CHF.** A CHF sum of greater than 100 earns a **Significant (High)** ranking. **Moderate (Medium)** is when the total is 2 to 100. **Minimal (Low)** is when a CHF is less than two.

FOR MORE INFORMATION

Air Force Civil Engineer Center
Environmental Restoration Program
www.afcec.af.mil

AFCEC CERCLA
Administrative Record (AR)
https://ar.afcec-cloud.af.mil/

POINT OF CONTACT
Troy Sanders NGB/A4VR
(240) 612-8506
troy.sanders.3.ctr@us.af.mil

Q. How is the Migration Pathway Factor (MPF) determined?

A. The movement of contamination at a site is evaluated and assigned a **MPF** rating.

Ratings for MPFs are designated as: **evident**, **potential**, or **confined** (for **High, Medium, and Low**). **Evident** exposure means the contamination is at a point where exposure to humans or the environment can occur, such as at a drinking water well. **Potential** ratings are given to sites where exposure may happen. A **confined** rating is given to sites where a low possibility for exposure may occur.

Q. How is the Receptor Factor (RF) determined?

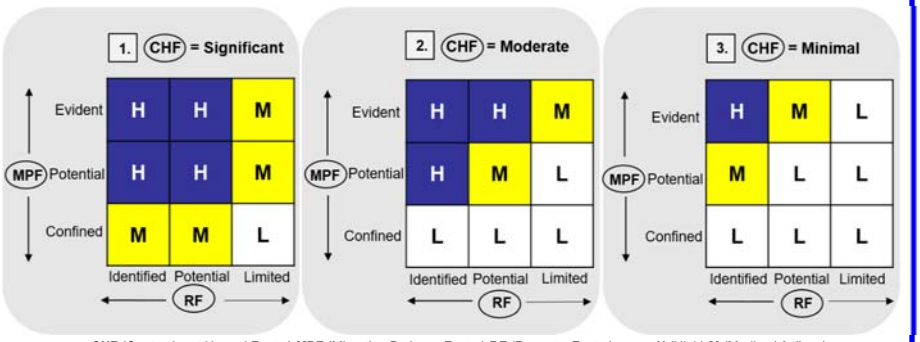
A. The **RF** is determined by a receptor's, such as humans, potential to come into contact with contaminated media. **RFs** are designated as: identified, potential, or limited **(High, Medium, and Low). Identified** rating is given when receptors are in contact or threat of contact with contaminated media. **Potential** is given when receptor may contact contaminated media. **Limited** is given when there is little or no contact with contaminated media.

RELATIVE RISK SITE EVALUTION, cont.

Media Relative Risk Rating

Q. How is the media relative risk rating determined?
A. Use the chart to determine the relative risk rating for each media evaluated. Start by choosing the **CHF** result of the evaluation. If the **CHF** is **Significant**, use **box 1.**; if **Moderate**, use **box 2.**; if **Minimal**, use **box 3.** Then find the **MPF** and **RF** results and move to the square where the results meet. That square indicates the media relative risk rating. For example, if the **CHF** is **Significant (go to box 1.)**, the **MPF** is **Potential** and the **RF** is **Identified**, then the rating is High (**H**).

Relative Risk Site Evaluation Matrix



CHF (Contaminant Hazard Factor) **MPF** (Migration Pathway Factor) **RF** (Receptor Factor) **H** (High) **M** (Medium) **L** (Low)

Overall Site Category

Q. How do I determine the Overall Site Category?
A. The highest relative risk media rating becomes the **Overall Site Category** for the site. For example, if a site has a groundwater relative risk rating of **High**, and soil relative risk rating of **Low**, then the Overall Site Category rating for the site is **High**.

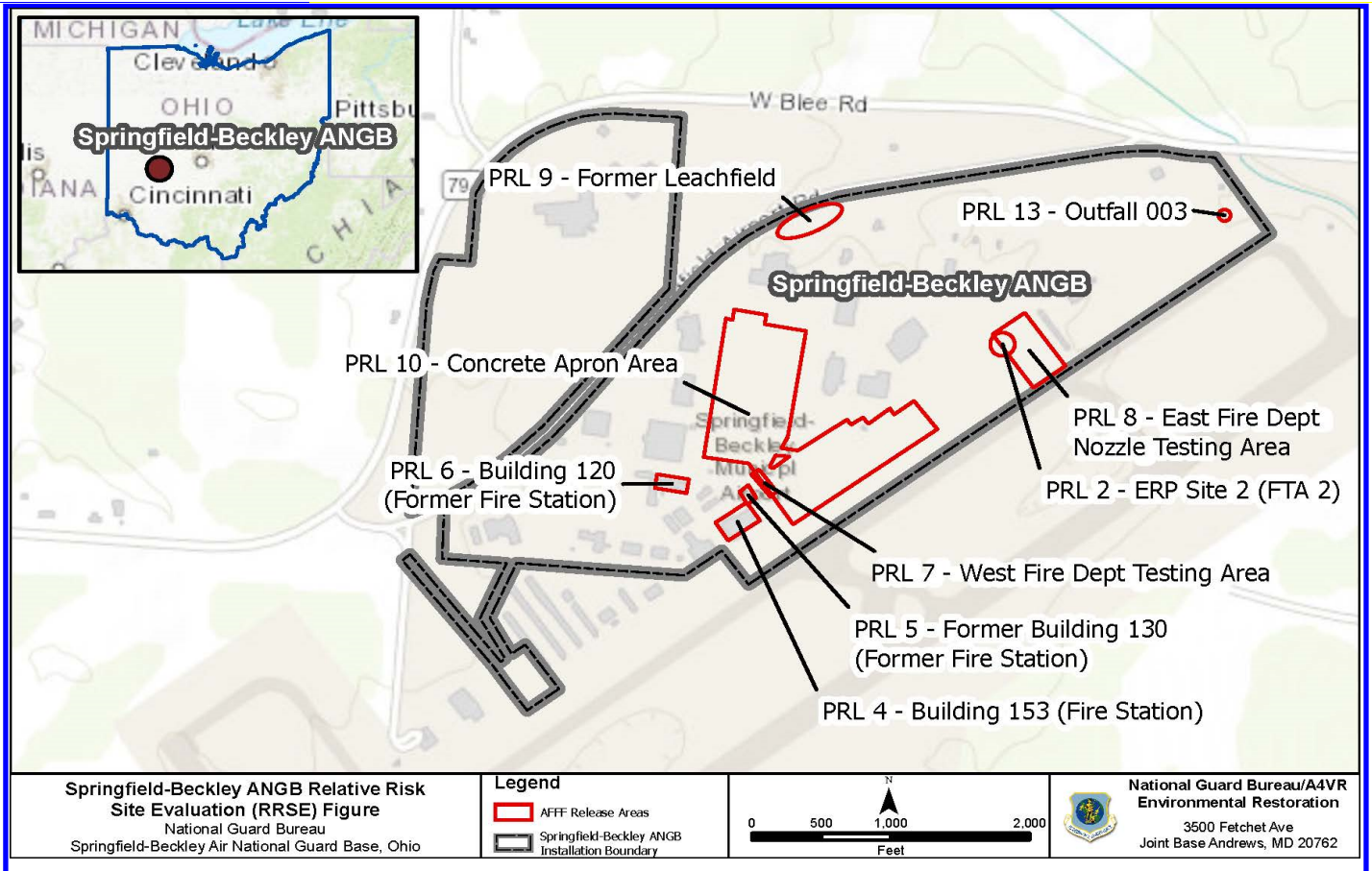
Regulatory and Stakeholder Involvement

Q. **How do I participate as Stakeholder?**

A. To offer opportunity to participate in RRSE, the Air Force announces a public comment period in your local newspaper. There is also opportunity to participate during installation Restoration Advisory Committees where active. Installation Restoration Advisory Committee meetings are also announced in your local newspaper.

Relative Risk Site Evaluation Summary Springfield-Beckley ANGB, OH

Overall Site Category	Site Name (Sites are shown on the map below and RRSE Worksheets are attached)
HIGH	PRL 4, PRL 5, PRL 6, PRL 7, PRL 8, PRL 10, PRL 13
MEDIUM	PRL 2, PRL 9
LOW	



AFFF Area is another term for Potential Release Location (PRL).

Site Background Information			
Installation:	Springfield-Beckley ANGB	**Date:**	10/5/2021
Location (State):	Ohio	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	Environmental Restoration Program Site 2/Fire Training Area 2 - PRL 2	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Troy Sanders	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: MEDIUM			

Site Summary	
Brief Site Description:	During a 2010 preliminary assessment (PA)/site investigation (SI), an apparent new fire training area (FTA) (FTA AT014) was observed north of Building 383. The FTA was located over concrete, which was in good condition. However, there was no berm to keep the potential contaminants from running off the concrete, and the FTA debris was located within 6 inches of the edge of the concrete and the surrounding gravel. In addition, a trailer was located near the FTA debris. It appears that the trailer may have also been used for FTA exercises. According to interviews with the fire chief, this area was used only once on a weekend in the summer of 2010 for firefighting training. A semi-trailer, which was on loan from the City of Springfield's Fire Department for a weekend, was placed on the concrete pad. Wooden pallets were placed inside the trailer and set on fire and the doors closed. The firefighters then entered the trailer to extinguish the fire with water only. The trailer remained onsite for no more than one week before being returned to the City's Fire Department.
Brief Description of Pathways:	The bedrock and unconsolidated formations underlying Springfield-Beckley Air National Guard Base (ANGB) are capable of groundwater production; though the unconsolidated formation is not used as a potable water source. The shallow groundwater depth at Springfield-Beckley ANGB ranges from approximately 1 to 25 foot (ft.) below ground surface (bgs) but is typically shallow (less than 5 ft. bgs). Groundwater production sourced from the bedrock formation for residential water wells are typically installed at approximately 150 ft. below ground surface (bgs) and municipal water supply wells are typically installed at depths of approximately 100 ft. bgs. Bedrock aquifers are reported to be semi-confined with hydraulic connection to the shallow groundwater system. The hydraulic gradient varies across the site, but generally trends north or northeast. The surface cover at PRL 2 is approximately half pavement and half vegetation with some surface soil exposed.
Brief Description of Receptors:	Potable water for residents within 1 mile of Springfield-Beckley ANGB is either provided by the City of Springfield or obtained from bedrock wells. Ten major production wells for municipal water supply in the area are located north (downgradient) of the City of Springfield at depths of approximately 100 ft. bgs. The SI Report indicates that 101 water wells are located within a 2-mile radius of the Base. Of those 101 reported wells, 77 appear to be private wells utilized for domestic use. No public water supply wells were identified within 1 mile of the Base. In late 2016 and early 2017, the Ohio Environmental Protection Agency, in coordination with the Clark County Health District and the Ohio Adjutant General's Department, sampled nine off-Base domestic drinking water wells believed most likely to be impacted by PFOS and PFOA releases from Springfield-Beckley ANGB. All results were non-detect for PFOS and PFOA. Receptors would include military and civilian personnel since the PRL is within the base boundaries. There are no residences nearby. PFAS including PFOA, PFOS, and PFBS have been detected at multiple Base wells at varying concentrations.

Groundwater Worksheet

Installation: Springfield-Beckley ANGB

Site ID: PRL 2 **AFFF Release Area #:** AFFF 2

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFBS	0.45	0.602	0.7

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	0.7
CHF > 100	H (High)	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CHF Value		CHF VALUE	L

Migratory Pathway Factor

Evident	Analytical data or direct observation indicates that contamination in the groundwater has moved to a point of exposure (e.g., well)	
Potential	Contamination in the groundwater has moved beyond the source or insufficient information available to make a determination of Evident or Confined	M
Confined	Analytical data or direct observation indicates that the potential for contaminant migration from the source via groundwater is limited (possibly due to geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M

Receptor Factor

Identified	Impacted drinking water well with detected contaminants or existing downgradient water supply well within 4 miles and groundwater is current source of drinking water (EPA Class I or IIA groundwater)	H
Potential	Existing downgradient drinking water well beyond 4 miles with no contaminant detection(s) or no known drinking water wells downgradient and groundwater is currently or potentially usable for drinking water (i.e., EPA Class I or II groundwater) or other beneficial use (e.g., agricultural)	
Limited	No known water supply wells downgradient and groundwater is not considered potential drinking water source and is of limited beneficial use (Class III)	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	H
	Groundwater Category	**MEDIUM**

Soil Worksheet

Installation: Springfield-Beckley ANGB

Site ID: PRL 2 **AFFF Release Area #:** AFFF 2

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.21	0.126	1.7
PFOA	0.022	0.126	0.2
PFBS	0.0043	1.9	0.0
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**1.8**
CHF > 100	**H (High)**		
100 > CHF > 2	**M (Medium)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**L**

Migratory Pathway Factor		
Evident	Analytical data or observable evidence that contamination is present at a point of exposure	H
Potential	Contamination has moved beyond the source, could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined	
Confined	Low possibility for contamination to be present at or migrate to a point of exposure	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	H
Receptor Factor		
Identified	Receptors identified that have access to contaminated soil	
Potential	Potential for receptors to have access to contaminated soil	M
Limited	No potential for receptors to have access to contaminated soil	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M
	Soil Category	**MEDIUM**

Site Background Information			
Installation:	Springfield-Beckley ANGB	**Date:**	10/5/2021
Location (State):	Ohio	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	Building 153 - Fire Station - PRL 4	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Troy Sanders	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	Building 153, the Fire Station, was constructed in 2005 for the Fire Department. After the last aircraft left the Base in September 2011, the Fire Department shipped their fleet of fire fighting vehicles with aqueous film forming foam (AFFF) to a Base in North Dakota. Documentation indicating the Base and quantities shipped was not available. Refractometer tests on AFFF were performed within the vehicle bay area of this building from approximately 2005 to 2007. After 2011, water-only equipment testing was performed in the concrete pavement on the airfield side of the Fire Station. Fire response vehicles with AFFF were kept in this building until 2011, where vehicles were also washed. All current fire response vehicles contain water only. At the time of the 2015 BB&E PA site visit, one 55-gal drum of AFFF, as well as five 5-gal buckets of AFFF, were stored at the Fire Station awaiting off-site disposal. Floor drains in the bay area of the building are connected to the sanitary sewer system via an oil/water separator (OWS). Base personnel were unaware of any releases of AFFF at this building. The monitoring well used to evaluate groundwater downgradient of this PRL was co-located/associated with PRL 5.
Brief Description of Pathways:	The bedrock and unconsolidated formations underlying Springfield-Beckley ANGB are capable of groundwater production; though the unconsolidated formation is not used as a potable water source. The shallow groundwater depth at Springfield-Beckley ANGB ranges from approximately 1 to 25 feet (ft) below ground surface (bgs) but is typically shallow (less than 5 ft. bgs). Groundwater production sourced from the bedrock formation for residential water wells are typically installed at approximately 150 ft. bgs and municipal water supply wells are typically installed at depths of approximately 100 ft. bgs. Bedrock aquifers are reported to be semi-confined with hydraulic connection to the shallow groundwater system. The hydraulic gradient varies across the site, but generally trends north or northeast. The surface cover at PRL 4 is mostly covered by the building. However, the building is surrounded by landscaped areas, which is where the soil samples were collected.
Brief Description of Receptors:	Potable water for residents within 1 mile of Springfield-Beckley ANGB is either provided by the City of Springfield or obtained from bedrock wells. Ten major production wells for municipal water supply in the area are located north (downgradient) of the City of Springfield at depths of approximately 100 ft. bgs. The SI Report indicates that 101 water wells are located within a 2-mile radius of the Base. Of those 101 reported wells, 77 appear to be private wells utilized for domestic use. No public water supply wells were identified within 1 mile of the Base. In late 2016 and early 2017, the Ohio Environmental Protection Agency, in coordination with the Clark County Health District and the Ohio Adjutant General's Department, sampled nine off-Base domestic drinking water wells believed most likely to be impacted by PFOS and PFOA releases from Springfield-Beckley ANGB. All results were non-detect for PFOS and PFOA. Receptors would include military and civilian personnel since the PRL is within the base boundaries. There are no residences nearby. PFAS including PFOA, PFOS, and PFBS have been detected at multiple Base wells at varying concentrations

Soil Worksheet

Installation: Springfield-Beckley ANGB

Site ID: PRL 4 **AFFF Release Area #:** AFFF 4

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.3	0.126	2.4
PFOA	0.0062	0.126	0.0
PFBS	0.00041	1.9	0.0
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**2.4**
CHF > 100	**H (High)**		
100 > CHF > 2	**M (Medium)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**M**

Migratory Pathway Factor		
Evident	Analytical data or observable evidence that contamination is present at a point of exposure	H
Potential	Contamination has moved beyond the source, could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined	
Confined	Low possibility for contamination to be present at or migrate to a point of exposure	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	H
Receptor Factor		
Identified	Receptors identified that have access to contaminated soil	
Potential	Potential for receptors to have access to contaminated soil	M
Limited	No potential for receptors to have access to contaminated soil	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M
	Soil Category	**HIGH**

Groundwater Worksheet

Installation: Springfield-Beckly ANGB

Site ID: PRL 4 **AFFF Release Area #:** AFFF 4

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOA	0.17	0.04	4.3
PFBS	0.21	0.602	0.3
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**4.6**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**M**

Migratory Pathway Factor

Evident	Analytical data or direct observation indicates that contamination in the groundwater has moved to a point of exposure (e.g., well)	
Potential	Contamination in the groundwater has moved beyond the source or insufficient information available to make a determination of Evident or Confined	M
Confined	Analytical data or direct observation indicates that the potential for contaminant migration from the source via groundwater is limited (possibly due to geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M

Receptor Factor

Identified	Impacted drinking water well with detected contaminants or existing downgradient water supply well within 4 miles and groundwater is current source of drinking water (EPA Class I or IIA groundwater)	H
Potential	Existing downgradient drinking water well beyond 4 miles with no contaminant detection(s) or no known drinking water wells downgradient and groundwater is currently or potentially usable for drinking water (i.e., EPA Class I or II groundwater) or other beneficial use (e.g., agricultural)	
Limited	No known water supply wells downgradient and groundwater is not considered potential drinking water source and is of limited beneficial use (Class III)	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	H
	Groundwater Category	**HIGH**

Site Background Information			
Installation:	Springfield-Beckley ANGB	**Date:**	10/5/2021
Location (State):	Ohio	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	Former Building 130 - Former Fire Station - PRL 5	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Troy Sanders	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	Former Building 130 was constructed in 1977 and demolished in the mid-2000s. It was used for the Fire Department from 1977 until 2005, when Building 153 – Fire Station (PRL 4) was constructed. Records of vehicle storage and AFFF storage were unavailable at the time of the 2015 BB&E PA site visit. During the time the Fire Department used this building, nozzle testing was performed on an asphalt area to the northeast of the building. In addition, refractometer tests on AFFF were performed within the vehicle bay area of this building from approximately 2004 to 2007.
Brief Description of Pathways:	The bedrock and unconsolidated formations underlying Springfield-Beckley ANGB are capable of groundwater production; though the unconsolidated formation is not used as a potable water source. The shallow groundwater depth at Springfield-Beckley ANGB ranges from approximately 1 to 25 ft. bgs but is typically shallow (less than 5 ft. bgs). Groundwater production sourced from the bedrock formation for residential water wells are typically installed at approximately 150 ft. below ground surface (bgs) and municipal water supply wells are typically installed at depths of approximately 100 ft. bgs. Bedrock aquifers are reported to be semi-confined with hydraulic connection to the shallow groundwater system. The hydraulic gradient varies across the site, but generally trends north or northeast. The surface cover at PRL 5 is primarily landscaped areas with some pavement present.
Brief Description of Receptors:	Potable water for residents within 1 mile of Springfield-Beckley ANGB is either provided by the City of Springfield or obtained from bedrock wells. Ten major production wells for municipal water supply in the area are located north (downgradient) of the City of Springfield at depths of approximately 100 ft. bgs. The SI Report indicates that 101 water wells are located within a 2-mile radius of the Base. Of those 101 reported wells, 77 appear to be private wells utilized for domestic use. No public water supply wells were identified within 1 mile of the Base. In late 2016 and early 2017, the Ohio Environmental Protection Agency, in coordination with the Clark County Health District and the Ohio Adjutant General's Department, sampled nine off-Base domestic drinking water wells believed most likely to be impacted by PFOS and PFOA releases from Springfield-Beckley ANGB. All results were non-detect for PFOS and PFOA. Receptors would include military and civilian personnel since the PRL is within the base boundaries. There are no residences nearby. PFAS including PFOA, PFOS, and PFBS have been detected at multiple Base wells at varying concentrations.

Groundwater Worksheet

Installation: Springfield-Beckley ANGB

Site ID: PRL 5 **AFFF Release Area #:** AFFF 5

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOA	0.17	0.04	4.3
PFBS	0.21	0.602	0.3
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**4.6**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**M**

Migratory Pathway Factor

Evident	Analytical data or direct observation indicates that contamination in the groundwater has moved to a point of exposure (e.g., well)	
Potential	Contamination in the groundwater has moved beyond the source or insufficient information available to make a determination of Evident or Confined	M
Confined	Analytical data or direct observation indicates that the potential for contaminant migration from the source via groundwater is limited (possibly due to geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M

Receptor Factor

Identified	Impacted drinking water well with detected contaminants or existing downgradient water supply well within 4 miles and groundwater is current source of drinking water (EPA Class I or IIA groundwater)	H
Potential	Existing downgradient drinking water well beyond 4 miles with no contaminant detection(s) or no known drinking water wells downgradient and groundwater is currently or potentially usable for drinking water (i.e., EPA Class I or II groundwater) or other beneficial use (e.g., agricultural)	
Limited	No known water supply wells downgradient and groundwater is not considered potential drinking water source and is of limited beneficial use (Class III)	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	H
	Groundwater Category	**HIGH**

Soil Worksheet

Installation: Springfield-Beckley ANGB

Site ID: PRL 5 **AFFF Release Area #:** AFFF 5

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.14	0.126	1.1
PFOA	0.0051	0.126	0.0
PFBS	0.000088	1.9	0.0
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**1.2**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**L**

Migratory Pathway Factor		
Evident	Analytical data or observable evidence that contamination is present at a point of exposure	H
Potential	Contamination has moved beyond the source, could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined	
Confined	Low possibility for contamination to be present at or migrate to a point of exposure	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	H
Receptor Factor		
Identified	Receptors identified that have access to contaminated soil	
Potential	Potential for receptors to have access to contaminated soil	M
Limited	No potential for receptors to have access to contaminated soil	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M
	Soil Category	**MEDIUM**

Site Background Information			
Installation:	Springfield-Beckley ANGB	**Date:**	10/5/2021
Location (State):	Ohio	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	Building 120 - Former Fire Station - PRL 6	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Troy Sanders	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	Building 120 was constructed in 1963 and is currently vacant. Base personnel reported anecdotal information that this building was once used as a fire station prior to Building 130's construction in 1977, but it is uncertain.
Brief Description of Pathways:	The bedrock and unconsolidated formations underlying Springfield-Beckley ANGB are capable of groundwater production; though the unconsolidated formation is not used as a potable water source. The shallow groundwater depth at Springfield-Beckley ANGB ranges from approximately 1 to 25 ft. bgs but is typically shallow (less than 5 ft. bgs). Groundwater production sourced from the bedrock formation for residential water wells are typically installed at approximately 150 ft. below ground surface (bgs) and municipal water supply wells are typically installed at depths of approximately 100 ft. bgs. Bedrock aquifers are reported to be semi-confined with hydraulic connection to the shallow groundwater system. The hydraulic gradient varies across the site, but generally trends north or northeast. The surface cover at PRL 6 is mostly covered by the building and surrounded by pavement. There are small landscaped areas on the north and east side of the building where the soil samples were collected.
Brief Description of Receptors:	Potable water for residents within 1 mile of Springfield-Beckley ANGB is either provided by the City of Springfield or obtained from bedrock wells. Ten major production wells for municipal water supply in the area are located north (downgradient) of the City of Springfield at depths of approximately 100 ft. bgs. The SI Report indicates that 101 water wells are located within a 2-mile radius of the Base. Of those 101 reported wells, 77 appear to be private wells utilized for domestic use. No public water supply wells were identified within 1 mile of the Base. In late 2016 and early 2017, the Ohio Environmental Protection Agency, in coordination with the Clark County Health District and the Ohio Adjutant General's Department, sampled nine off-Base domestic drinking water wells believed most likely to be impacted by PFOS and PFOA releases from Springfield-Beckley ANGB. All results were non-detect for PFOS and PFOA. Receptors would include military and civilian personnel since the PRL is within the base boundaries. There are no residences nearby. PFAS including PFOA, PFOS, and PFBS have been detected at multiple Base wells at varying concentrations

Groundwater Worksheet

Installation: Springfield-Beckley ANGB

Site ID: PRL 6 **AFFF Release Area #:** AFFF 6

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOA	4.8	0.04	120.0
PFBS	0.2	0.602	0.3
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**120.3**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**H**

Migratory Pathway Factor		
Evident	Analytical data or direct observation indicates that contamination in the groundwater has moved to a point of exposure (e.g., well)	
Potential	Contamination in the groundwater has moved beyond the source or insufficient information available to make a determination of Evident or Confined	M
Confined	Analytical data or direct observation indicates that the potential for contaminant migration from the source via groundwater is limited (possibly due to geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M
Receptor Factor		
Identified	Impacted drinking water well with detected contaminants or existing downgradient water supply well within 4 miles and groundwater is current source of drinking water (EPA Class I or IIA groundwater)	H
Potential	Existing downgradient drinking water well beyond 4 miles with no contaminant detection(s) or no known drinking water wells downgradient and groundwater is currently or potentially usable for drinking water (i.e., EPA Class I or II groundwater) or other beneficial use (e.g., agricultural)	
Limited	No known water supply wells downgradient and groundwater is not considered potential drinking water source and is of limited beneficial use (Class III)	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	H
	Groundwater Category	**HIGH**

Soil Worksheet

Installation: Springfield-Beckley ANGB

Site ID: PRL 6 **AFFF Release Area #:** AFFF 6

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.36	0.126	2.9
PFOA	0.12	0.126	1.0
PFBS	0.0032	1.9	0.0
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**3.8**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**M**

Migratory Pathway Factor		
Evident	Analytical data or observable evidence that contamination is present at a point of exposure	H
Potential	Contamination has moved beyond the source, could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined	
Confined	Low possibility for contamination to be present at or migrate to a point of exposure	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	H

Receptor Factor		
Identified	Receptors identified that have access to contaminated soil	
Potential	Potential for receptors to have access to contaminated soil	M
Limited	No potential for receptors to have access to contaminated soil	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M
	Soil Category	**HIGH**

Site Background Information			
Installation:	Springfield-Beckley ANGB	**Date:**	10/5/2021
Location (State):	Ohio	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	West FD Nozzle Testing Area - PRL 7	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Troy Sanders	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	The West FD Nozzle Testing Area - PRL 7 is an asphalt area, located northeast of Former Building 130 – Former Fire Station (PRL 5). This PRL was used for annual Fire Department nozzle testing with AFFF from approximately the mid-1970s through 2004. The quantities of AFFF used are unknown. The foam was allowed to naturally dissipate after the tests were performed. The monitoring well used to evaluate groundwater downgradient of this PRL was co-located/associated with PRL 10.
Brief Description of Pathways:	The bedrock and unconsolidated formations underlying Springfield-Beckley ANGB are capable of groundwater production; though the unconsolidated formation is not used as a potable water source. The shallow groundwater depth at Springfield-Beckley ANGB ranges from approximately 1 to 25 ft. bgs but is typically shallow (less than 5 ft. bgs). Groundwater production sourced from the bedrock formation for residential water wells are typically installed at approximately 150 ft. below ground surface (bgs) and municipal water supply wells are typically installed at depths of approximately 100 ft. bgs. Bedrock aquifers are reported to be semi-confined with hydraulic connection to the shallow groundwater system. The hydraulic gradient varies across the site, but generally trends north or northeast. The surface cover at PRL 7 is mostly concrete. However, the soil samples were collected from grassy areas southwest and northeast of the concrete.
Brief Description of Receptors:	Potable water for residents within 1 mile of Springfield-Beckley ANGB is either provided by the City of Springfield or obtained from bedrock wells. Ten major production wells for municipal water supply in the area are located north (downgradient) of the City of Springfield at depths of approximately 100 ft. bgs. The SI Report indicates that 101 water wells are located within a 2-mile radius of the Base. Of those 101 reported wells, 77 appear to be private wells utilized for domestic use. No public water supply wells were identified within 1 mile of the Base. In late 2016 and early 2017, the Ohio Environmental Protection Agency, in coordination with the Clark County Health District and the Ohio Adjutant General's Department, sampled nine off-Base domestic drinking water wells believed most likely to be impacted by PFOS and PFOA releases from Springfield-Beckley ANGB. All results were non-detect for PFOS and PFOA. Receptors would include military and civilian personnel since the PRL is within the base boundaries. There are no residences nearby. PFAS including PFOA, PFOS, and PFBS have been detected at multiple Base wells at varying concentrations

Groundwater Worksheet

Installation: Springfield-Beckly ANGB

Site ID: PRL 7 **AFFF Release Area #:** AFFF 7

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOS	0.083	0.04	2.1
PFOA	0.043	0.04	1.1
PFBS	0.049	0.602	0.1

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	3.3
CHF > 100	H (High)	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CHF Value		CHF VALUE	M

Migratory Pathway Factor

Evident	Analytical data or direct observation indicates that contamination in the groundwater has moved to a point of exposure (e.g., well)	
Potential	Contamination in the groundwater has moved beyond the source or insufficient information available to make a determination of Evident or Confined	M
Confined	Analytical data or direct observation indicates that the potential for contaminant migration from the source via groundwater is limited (possibly due to geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M

Receptor Factor

Identified	Impacted drinking water well with detected contaminants or existing downgradient water supply well within 4 miles and groundwater is current source of drinking water (EPA Class I or IIA groundwater)	H
Potential	Existing downgradient drinking water well beyond 4 miles with no contaminant detection(s) or no known drinking water wells downgradient and groundwater is currently or potentially usable for drinking water (i.e., EPA Class I or II groundwater) or other beneficial use (e.g., agricultural)	
Limited	No known water supply wells downgradient and groundwater is not considered potential drinking water source and is of limited beneficial use (Class III)	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	H
	Groundwater Category	**HIGH**

Soil Worksheet

Installation: Springfield-Beckley ANGB

Site ID: PRL 7 **AFFF Release Area #:** AFFF 7

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.25	0.126	2.0
PFOA	0.0044	0.126	0.0
PFBS	0.00024	1.9	0.0
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**2.0**
CHF > 100	**H (High)**		
100 > CHF > 2	**M (Medium)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**M**

Migratory Pathway Factor		
Evident	Analytical data or observable evidence that contamination is present at a point of exposure	H
Potential	Contamination has moved beyond the source, could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined	
Confined	Low possibility for contamination to be present at or migrate to a point of exposure	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	H
Receptor Factor		
Identified	Receptors identified that have access to contaminated soil	
Potential	Potential for receptors to have access to contaminated soil	M
Limited	No potential for receptors to have access to contaminated soil	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M
	Soil Category	**HIGH**

Site Background Information			
Installation:	Springfield-Beckley ANGB	**Date:**	10/5/2021
Location (State):	Ohio	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	East FD Nozzle Testing Area - PRL 8	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Troy Sanders	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	The East FD Nozzle Testing Area is located on the Tiger Ramp, a concrete ramp in the eastern portion of the Base. This area overlaps Former ERP Site 2 (FTA 2 [PRL 2]). Testing was performed in this area with AFFF from approximately 2007 through 2011 in accordance with an agreement made with the Base Civil Engineering Department, which was that testing could only occur on hot, dry days. The foam was allowed to naturally dissipate after the tests were performed. The quantities of AFFF used are unknown. After 2011, these equipment tests were conducted with water only on the concrete pavement by Building 153 – Fire Station (PRL 4). The monitoring well used to evaluate groundwater downgradient of this PRL was co-located/associated with PRL 2.
Brief Description of Pathways:	The bedrock and unconsolidated formations underlying Springfield-Beckley ANGB are capable of groundwater production; though the unconsolidated formation is not used as a potable water source. The shallow groundwater depth at Springfield-Beckley ANGB ranges from approximately 1 to 25 ft. bgs but is typically shallow (less than 5 ft. bgs). Groundwater production sourced from the bedrock formation for residential water wells are typically installed at approximately 150 ft. below ground surface (bgs) and municipal water supply wells are typically installed at depths of approximately 100 ft. bgs. Bedrock aquifers are reported to be semi-confined with hydraulic connection to the shallow groundwater system. The hydraulic gradient varies across the site, but generally trends north or northeast. The surface cover at PRL 8 is pavement. However, the PRL is surrounded by grassy areas, which are where the soil samples were collected.
Brief Description of Receptors:	Potable water for residents within 1 mile of Springfield-Beckley ANGB is either provided by the City of Springfield or obtained from bedrock wells. Ten major production wells for municipal water supply in the area are located north (downgradient) of the City of Springfield at depths of approximately 100 ft. bgs. The SI Report indicates that 101 water wells are located within a 2-mile radius of the Base. Of those 101 reported wells, 77 appear to be private wells utilized for domestic use. No public water supply wells were identified within 1 mile of the Base. In late 2016 and early 2017, the Ohio Environmental Protection Agency, in coordination with the Clark County Health District and the Ohio Adjutant General's Department, sampled nine off-Base domestic drinking water wells believed most likely to be impacted by PFOS and PFOA releases from Springfield-Beckley ANGB. All results were non-detect for PFOS and PFOA. Receptors would include military and civilian personnel since the PRL is within the base boundaries. There are no residences nearby. PFAS including PFOA, PFOS, and PFBS have been detected at multiple Base wells at varying concentrations

Groundwater Worksheet

Installation: Springfield-Beckly ANGB

Site ID: PRL 8 **AFFF Release Area #:** AFFF 8

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFBS	0.45	0.602	0.7

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	0.7
CHF > 100	H (High)	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CHF Value		CHF VALUE	L

Migratory Pathway Factor

Evident	Analytical data or direct observation indicates that contamination in the groundwater has moved to a point of exposure (e.g., well)	
Potential	Contamination in the groundwater has moved beyond the source or insufficient information available to make a determination of Evident or Confined	M
Confined	Analytical data or direct observation indicates that the potential for contaminant migration from the source via groundwater is limited (possibly due to geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M

Receptor Factor

Identified	Impacted drinking water well with detected contaminants or existing downgradient water supply well within 4 miles and groundwater is current source of drinking water (EPA Class I or IIA groundwater)	H
Potential	Existing downgradient drinking water well beyond 4 miles with no contaminant detection(s) or no known drinking water wells downgradient and groundwater is currently or potentially usable for drinking water (i.e., EPA Class I or II groundwater) or other beneficial use (e.g., agricultural)	
Limited	No known water supply wells downgradient and groundwater is not considered potential drinking water source and is of limited beneficial use (Class III)	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	H
	Groundwater Category	**MEDIUM**

Soil Worksheet

Installation: Springfield-Beckley ANGB

Site ID: PRL 8 **AFFF Release Area #:** AFFF 8

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.5	0.126	4.0
PFOA	0.011	0.126	0.1
PFBS	0.00037	1.9	0.0
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**4.1**
CHF > 100	**H (High)**		
100 > CHF > 2	**M (Medium)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**M**

Migratory Pathway Factor		
Evident	Analytical data or observable evidence that contamination is present at a point of exposure	H
Potential	Contamination has moved beyond the source, could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined	
Confined	Low possibility for contamination to be present at or migrate to a point of exposure	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	H
Receptor Factor		
Identified	Receptors identified that have access to contaminated soil	
Potential	Potential for receptors to have access to contaminated soil	M
Limited	No potential for receptors to have access to contaminated soil	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M
	Soil Category	**HIGH**

Site Background Information			
Installation:	Springfield-Beckley ANGB	**Date:**	10/5/2021
Location (State):	Ohio	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	Former Leachfield - PRL 9	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Troy Sanders	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: MEDIUM			

Site Summary	
Brief Site Description:	From 1950 to 1988, the Base sanitary sewer collection system incorporated OWSs at several buildings, including the Fire Station (presumably both Building 120 [PRL 6] and Building 130 [PRL 5]). These OWSs were connected to the sewer system, which drained into a septic tank and associated leachfield. The Base converted to a municipal sewer system in 1988, at which time the leachfield was abandoned in place. Assuming AFFF entered some of these OWSs, this area, located in the northwestern portion of the Base, may have received AFFF. Building 150 was constructed in a portion of this area in 2000. During the Leidos SI site visit, Base personnel indicated that a geothermal system is currently installed in the vicinity of the former leachfield.
Brief Description of Pathways:	The bedrock and unconsolidated formations underlying Springfield-Beckley ANGB are capable of groundwater production; though the unconsolidated formation is not used as a potable water source. The shallow groundwater depth at Springfield-Beckley ANGB ranges from approximately 1 to 25 ft. bgs but is typically shallow (less than 5 ft. bgs). Groundwater production sourced from the bedrock formation for residential water wells are typically installed at approximately 150 ft. below ground surface (bgs) and municipal water supply wells are typically installed at depths of approximately 100 ft. bgs. Bedrock aquifers are reported to be semi-confined with hydraulic connection to the shallow groundwater system. The hydraulic gradient varies across the site, but generally trends north or northeast. PRL 9 is a grassy area located along the base boundary.
Brief Description of Receptors:	Potable water for residents within 1 mile of Springfield-Beckley ANGB is either provided by the City of Springfield or obtained from bedrock wells. Ten major production wells for municipal water supply in the area are located north (downgradient) of the City of Springfield at depths of approximately 100 ft. bgs. The SI Report indicates that 101 water wells are located within a 2-mile radius of the Base. Of those 101 reported wells, 77 appear to be private wells utilized for domestic use. No public water supply wells were identified within 1 mile of the Base. In late 2016 and early 2017, the Ohio Environmental Protection Agency, in coordination with the Clark County Health District and the Ohio Adjutant General's Department, sampled nine off-Base domestic drinking water wells believed most likely to be impacted by PFOS and PFOA releases from Springfield-Beckley ANGB. All results were non-detect for PFOS and PFOA. Receptors would include military and civilian personnel since the PRL is within the base boundaries. There are no residences nearby. PFAS including PFOA, PFOS, and PFBS have been detected at multiple Base wells at varying concentrations

Groundwater Worksheet

Installation: Springfield-Beckley ANGB

Site ID: PRL 9 **AFFF Release Area #:** AFFF 9

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOA	0.044	0.04	1.1
PFBS	0.0078	0.602	0.0
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**1.1**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**L**

Migratory Pathway Factor

Evident	Analytical data or direct observation indicates that contamination in the groundwater has moved to a point of exposure (e.g., well)	
Potential	Contamination in the groundwater has moved beyond the source or insufficient information available to make a determination of Evident or Confined	M
Confined	Analytical data or direct observation indicates that the potential for contaminant migration from the source via groundwater is limited (possibly due to geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M

Receptor Factor

Identified	Impacted drinking water well with detected contaminants or existing downgradient water supply well within 4 miles and groundwater is current source of drinking water (EPA Class I or IIA groundwater)	H
Potential	Existing downgradient drinking water well beyond 4 miles with no contaminant detection(s) or no known drinking water wells downgradient and groundwater is currently or potentially usable for drinking water (i.e., EPA Class I or II groundwater) or other beneficial use (e.g., agricultural)	
Limited	No known water supply wells downgradient and groundwater is not considered potential drinking water source and is of limited beneficial use (Class III)	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	H
	Groundwater Category	**MEDIUM**

Soil Worksheet

Installation: Springfield-Beckley ANGB

Site ID: PRL 9 **AFFF Release Area #:** AFFF 9

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.012	0.126	0.1
PFOA	0.0028	0.126	0.0

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	0.1
CHF > 100	H (High)		
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CHF Value		CHF VALUE	L

$$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$$

Migratory Pathway Factor		
Evident	Analytical data or observable evidence that contamination is present at a point of exposure	
Potential	Contamination has moved beyond the source, could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined	M
Confined	Low possibility for contamination to be present at or migrate to a point of exposure	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M

Receptor Factor		
Identified	Receptors identified that have access to contaminated soil	
Potential	Potential for receptors to have access to contaminated soil	M
Limited	No potential for receptors to have access to contaminated soil	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M
	Soil Category	**LOW**

Site Background Information			
Installation:	Springfield-Beckley ANGB	**Date:**	10/5/2021
Location (State):	Ohio	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	Concrete Apron Area - PRL 10	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Troy Sanders	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	Although there are no records of AFFF usage on the concrete apron and ramp area in the central portion of the Base, the area could potentially have been impacted by AFFF if used on parked aircraft. Stormwater in this area is routed to Stormwater Outfall 002 through stormwater catch basins.
Brief Description of Pathways:	The bedrock and unconsolidated formations underlying Springfield-Beckley ANGB are capable of groundwater production; though the unconsolidated formation is not used as a potable water source. The shallow groundwater depth at Springfield-Beckley ANGB ranges from approximately 1 to 25 ft. bgs but is typically shallow (less than 5 ft. bgs). Groundwater production sourced from the bedrock formation for residential water wells are typically installed at approximately 150 ft. below ground surface (bgs) and municipal water supply wells are typically installed at depths of approximately 100 ft. bgs. Bedrock aquifers are reported to be semi-confined with hydraulic connection to the shallow groundwater system. The hydraulic gradient varies across the site, but generally trends north or northeast. The surface cover at PRL 10 is concrete. However, the PRL is surrounded by grassy/landscaped areas where the soil samples were collected.
Brief Description of Receptors:	Potable water for residents within 1 mile of Springfield-Beckley ANGB is either provided by the City of Springfield or obtained from bedrock wells. Ten major production wells for municipal water supply in the area are located north (downgradient) of the City of Springfield at depths of approximately 100 ft. bgs. The SI Report indicates that 101 water wells are located within a 2-mile radius of the Base. Of those 101 reported wells, 77 appear to be private wells utilized for domestic use. No public water supply wells were identified within 1 mile of the Base. In late 2016 and early 2017, the Ohio Environmental Protection Agency, in coordination with the Clark County Health District and the Ohio Adjutant General's Department, sampled nine off-Base domestic drinking water wells believed most likely to be impacted by PFOS and PFOA releases from Springfield-Beckley ANGB. All results were non-detect for PFOS and PFOA. Receptors would include military and civilian personnel since the PRL is within the base boundaries. There are no residences nearby. PFAS including PFOA, PFOS, and PFBS have been detected at multiple Base wells at varying concentrations

Groundwater Worksheet

Installation: Springfield-Beckley ANGB

Site ID: PRL 10 **AFFF Release Area #:** AFFF 10

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOS	0.083	0.04	2.1
PFOA	0.043	0.04	1.1
PFBS	0.049	0.602	0.1

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	3.2
CHF > 100	H (High)	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CHF Value		CHF VALUE	M

Migratory Pathway Factor

Evident	Analytical data or direct observation indicates that contamination in the groundwater has moved to a point of exposure (e.g., well)	
Potential	Contamination in the groundwater has moved beyond the source or insufficient information available to make a determination of Evident or Confined	M
Confined	Analytical data or direct observation indicates that the potential for contaminant migration from the source via groundwater is limited (possibly due to geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M

Receptor Factor

Identified	Impacted drinking water well with detected contaminants or existing downgradient water supply well within 4 miles and groundwater is current source of drinking water (EPA Class I or IIA groundwater)	H
Potential	Existing downgradient drinking water well beyond 4 miles with no contaminant detection(s) or no known drinking water wells downgradient and groundwater is currently or potentially usable for drinking water (i.e., EPA Class I or II groundwater) or other beneficial use (e.g., agricultural)	
Limited	No known water supply wells downgradient and groundwater is not considered potential drinking water source and is of limited beneficial use (Class III)	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	H
	Groundwater Category	**HIGH**

Soil Worksheet

Installation: Springfield-Beckley ANGB

Site ID: PRL 10 **AFFF Release Area #:** AFFF 10

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.019	0.126	0.2
PFOA	0.0004	0.126	0.0

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	0.2
CHF > 100	H (High)		
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CHF Value		CHF VALUE	L

$$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$$

Migratory Pathway Factor		
Evident	Analytical data or observable evidence that contamination is present at a point of exposure	
Potential	Contamination has moved beyond the source, could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined	M
Confined	Low possibility for contamination to be present at or migrate to a point of exposure	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M

Receptor Factor		
Identified	Receptors identified that have access to contaminated soil	
Potential	Potential for receptors to have access to contaminated soil	M
Limited	No potential for receptors to have access to contaminated soil	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M
	Soil Category	**LOW**

Site Background Information			
Installation:	Springfield-Beckley ANGB	**Date:**	10/5/2021
Location (State):	Ohio	**Media Evaluated:**	Groundwater
Site Name and ID:	Stormwater Outfall 003 - PRL 13	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Troy Sanders	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	The northeast portion of the Base drains northward into Mill Creek via the Eastern Detention Pond, which collects runoff from ERP Site 2 – FTA 2 (PRL 2) and the East Fire Department Nozzle Testing Area (PRL 8). Once runoff is discharged through this outfall off-Base, flow travels northeast through a series of drainage ditches, which discharge to Mill Creek. No soil samples were collected.
Brief Description of Pathways:	The bedrock and unconsolidated formations underlying Springfield-Beckley ANGB are capable of groundwater production; though the unconsolidated formation is not used as a potable water source. The shallow groundwater depth at Springfield-Beckley ANGB ranges from approximately 1 to 25 ft. bgs but is typically shallow (less than 5 ft. bgs). Groundwater production sourced from the bedrock formation for residential water wells are typically installed at approximately 150 ft. below ground surface (bgs) and municipal water supply wells are typically installed at depths of approximately 100 ft. bgs. Bedrock aquifers are reported to be semi-confined with hydraulic connection to the shallow groundwater system. The hydraulic gradient varies across the site, but generally trends north or northeast. The surface cover at PRL13 is grassy.
Brief Description of Receptors:	Potable water for residents within 1 mile of Springfield-Beckley ANGB is either provided by the City of Springfield or obtained from bedrock wells. Ten major production wells for municipal water supply in the area are located north (downgradient) of the City of Springfield at depths of approximately 100 ft. bgs. The SI Report indicates that 101 water wells are located within a 2-mile radius of the Base. Of those 101 reported wells, 77 appear to be private wells utilized for domestic use. No public water supply wells were identified within 1 mile of the Base. In late 2016 and early 2017, the Ohio Environmental Protection Agency, in coordination with the Clark County Health District and the Ohio Adjutant General's Department, sampled nine off-Base domestic drinking water wells believed most likely to be impacted by PFOS and PFOA releases from Springfield-Beckley ANGB. All results were non-detect for PFOS and PFOA. Receptors would include military and civilian personnel since the PRL is within the base boundaries. There are no residences nearby. PFAS including PFOA, PFOS, and PFBS have been detected at multiple Base wells at varying concentrations

Groundwater Worksheet

Installation: Springfield-Beckley ANGB

Site ID: PRL 13 **AFFF Release Area #:** AFFF 13

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOS	2.4	0.04	60.0
PFOA	0.27	0.04	6.8
PFBS	0.11	0.602	0.2

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	66.9
CHF > 100	H (High)	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CHF Value		CHF VALUE	M

Migratory Pathway Factor

Evident	Analytical data or direct observation indicates that contamination in the groundwater has moved to a point of exposure (e.g., well)	
Potential	Contamination in the groundwater has moved beyond the source or insufficient information available to make a determination of Evident or Confined	M
Confined	Analytical data or direct observation indicates that the potential for contaminant migration from the source via groundwater is limited (possibly due to geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M

Receptor Factor

Identified	Impacted drinking water well with detected contaminants or existing downgradient water supply well within 4 miles and groundwater is current source of drinking water (EPA Class I or IIA groundwater)	H
Potential	Existing downgradient drinking water well beyond 4 miles with no contaminant detection(s) or no known drinking water wells downgradient and groundwater is currently or potentially usable for drinking water (i.e., EPA Class I or II groundwater) or other beneficial use (e.g., agricultural)	
Limited	No known water supply wells downgradient and groundwater is not considered potential drinking water source and is of limited beneficial use (Class III)	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	H
	Groundwater Category	**HIGH**