RELATIVE RISK SITE EVALUATION

Abraham Lincoln Springfield (Capital) Air National Guard Base, Illinois

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. 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 Abraham Lincoln Springfield Air National Guard Base (ANGB) PFAS PA and SI can be found at the Air Force 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, scroll down the Installation List and click on A Lincoln Springfield (Capital), IL, then enter the AR Number 469946 in the “AR #” field for the PA. For the SI, enter the AR Number 605540, 605541, and 605542. Then click “Search” at the bottom of the page. Click on 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

AST – Aboveground Storage Tank

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

PFOS - Perfluorooctane sulfonate

PFOA - Perfluorooctanoic acid

PRL - Potential Release Location

RCRA – Resource Conservation and Recovery Act

RF – Receptor Factor

RI – Remedial Investigation

RRSE – Relative Risk Site Evaluation

SI – Site Inspection

SWMU – Solid Waste Management Unit

RELATIVE RISK SITE EVALUATION, cont.

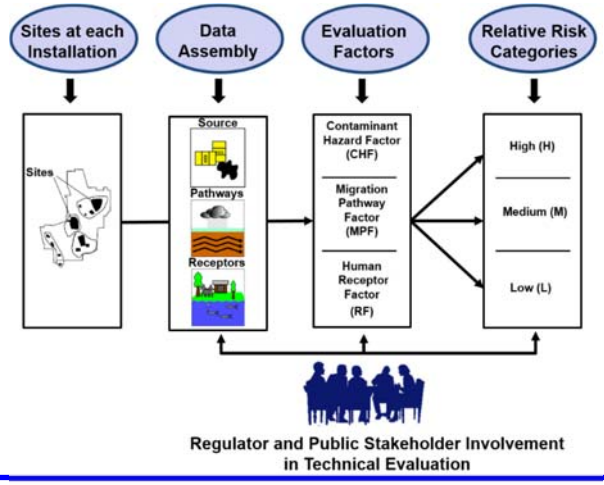
Q. What is the Relative Risk Site Evaluation (RRSE)?

A. RRSE is a methodology to sequence environmental restoration work used by the Department of Defense (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 Comprehensive Environmental Response, Compensation, and Liability Act (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

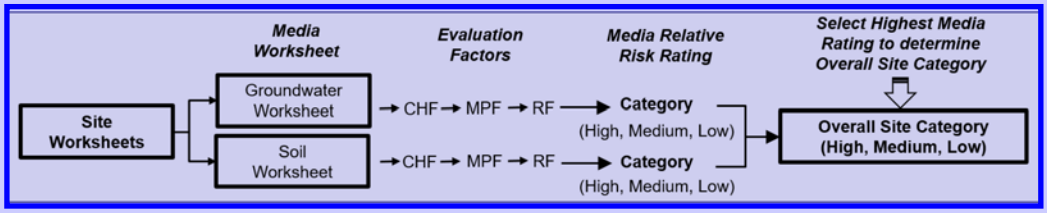


Sites at Each Installation

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 Contaminant Hazard Factor (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 **Contaminant Hazard Factor (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/

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

A. The movement of contamination at a site is evaluated and assigned a **Migration Pathway Factor (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.

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

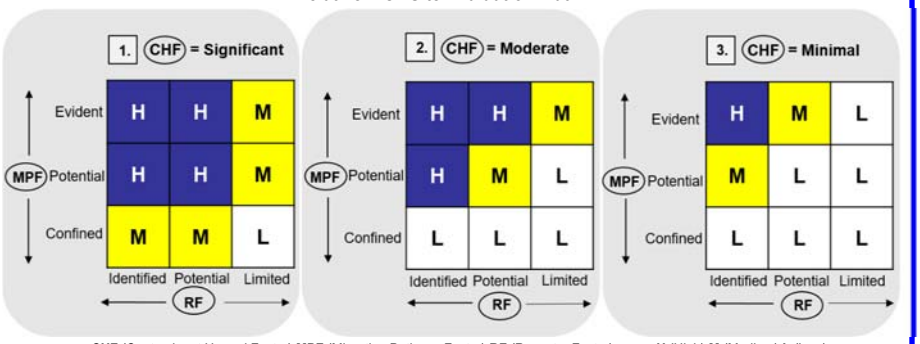
A. The **Receptor Factor (RF)** is determined by a receptor's, such as humans, potential to come into contact with contaminated media. **RFs** are designated as: identified, potential, or limited **(High, Medium, and Low). Identified** rating is given when receptors are in contact or threat of contact 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**.

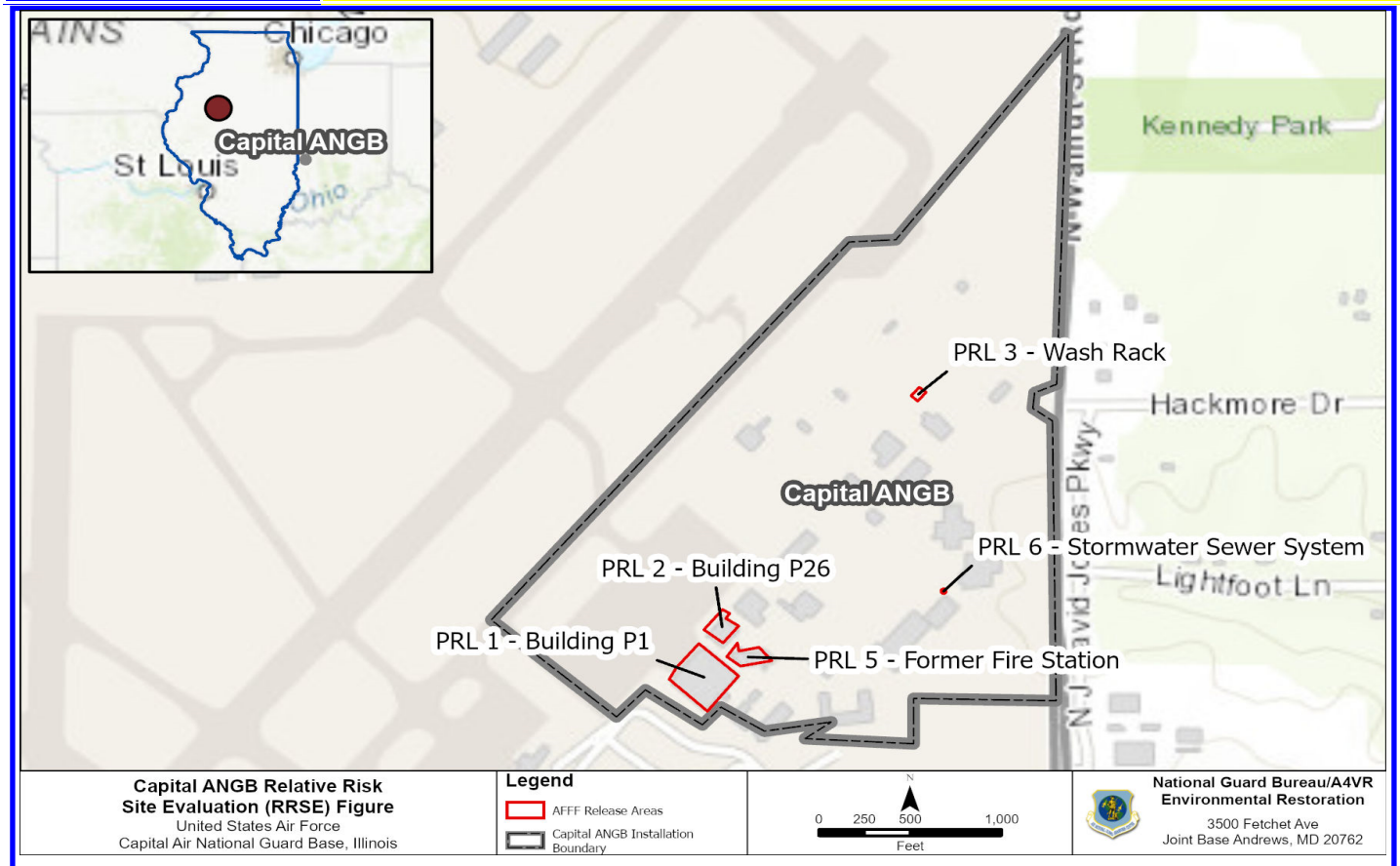
Regulatory and Stakeholder Involvement

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 Capital ANGB, IL

Overall Site Category	Site Name (Sites are shown on the map below and RRSE Worksheets are attached)
HIGH	PRL 1, PRL 2, PRL 3, PRL 5, and PRL 6
MEDIUM	None
LOW	None



Notes:
Aqueous Film Forming Foam (AFFF) Area is another term for Potential Release Location (PRL).

Site Background Information			
Installation:	Capital Air National Guard Base (ANGB)	**Date:**	9/9/2021
Location (State):	Illinois	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	Building P1 - PRL 1	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Macrina Xavier	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	Building P1 is the main hangar and previously used an AFFF Fire Suppression System (FSS) which was tested every two years. Building P1 is identified in the Site Inspection (SI) report as Potential Release Location (PRL) 1. Testing involved the automatic activation of the FSS to verify that foam would disperse. Upon visual verification of foam release, the system would be shut down. Foam would flow to the trench drains located within Bldg. P1 which discharge to sanitary via an oil-water separator (OWS). Occasionally a vacuum truck was used to remove the foam during system testing. The AFFF was then drained from the vacuum truck at the Wash Rack (PRL 3). Base personnel noted that when the system was tested, occasionally the AFFF flowed outside the building. In the mid-1990s a small amount of AFFF was rinsed into the stormwater sewer (PRL 6), and subsequently foam was found in Lightfoot Creek (no release report was available). The AFFF FSS was removed from the building in approximately 2011. The AFFF tank was also removed.
Brief Description of Pathways:	Surface soil at Capital ANGB is present as maintained grass surrounding buildings and adjacent to paved areas. Surface runoff at Capital ANGB is collected in a series of storm drains, open ditches, and drainage swales. This runoff joins the airport's storm drain system and the outfall (outside of Base boundary) flows into Lightfoot Creek. No surface water features are present within the current Base boundary. Groundwater flow in the shallow, unconfined aquifer is generally to the southeast. Depth to groundwater ranged from 4.5 to 11 ft. below ground surface (bgs) during the SI. Regional groundwater is generally unconfined and heterogeneous, with highly variable water chemistry and flow. Drinking water is withdrawn from Lake Springfield, located approximately 5 miles southeast of Capital, and supplied to the Base by City Water, Light, and Power.
Brief Description of Receptors:	Activities at the Base have been typical of those at most airports and military air bases, including fueling and maintenance operations. These activities are consistent with industrial/commercial receptor scenarios. A well inventory conducted for the PA shows 55 wells within a one-mile radius of the Capital ANGB. Four of these wells are engineering test wells and 17 are monitoring wells. The remaining 34 wells appear to be private wells utilized for agricultural or domestic use. Within one mile downgradient of the base (southeast), multiple private wells and no public water supply system wells were identified. PFAS including PFOA, PFOS, and PFBS have been detected at multiple on-site monitoring wells at varying concentrations.

Groundwater Worksheet

Installation: Capital ANGB

Site ID: PRL 1 **AFFF Release Area #:** AFFF 1

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOS	0.414	0.04	10.4
PFOA	0.156	0.04	3.9
PFBS	0.107	0.602	0.2

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	14.4
CHF > 100	H (High)		
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		

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

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: Capital ANGB

Site ID: PRL 1 **AFFF Release Area #:** AFFF 1

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.0226	0.126	0.2
PFOA	0.00271	0.126	0.0
PFBS	0.000503	1.9	0.0

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	0.2
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	
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:	Capital ANGB	**Date:**	9/9/2021
Location (State):	Illinois	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	Building P26 - PRL 2	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Macrina Xavier	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	Building P26 was previously used as a maintenance hangar and had an AFFF Fire Suppression System (FSS) which was tested every two years. Building P26 is identified in the SI report as PRL 2. Foam would flow to the trench drains located within Building P26 and discharge to sanitary via an OWS. Base personnel noted that when the system was tested, occasionally the AFFF flowed outside the building. The system and tank was removed from the building in approximately 2018. The Former Fire Station (Bldg. P4), constructed in 1951 and demolished in 1987, was located at the current location of Building P26. AFFF usage at the Former Fire Station (Bldg. P4) is unknown.
Brief Description of Pathways:	Surface soil at Capital ANGB is present as maintained grass surrounding buildings and adjacent to paved areas. Surface runoff at Capital ANGB is collected in a series of storm drains, open ditches, and drainage swales. This runoff joins the airport's storm drain system and the outfall (outside of Base boundary) flows into Lightfoot Creek. No surface water features are present within the current Base boundary. Groundwater flow in the shallow, unconfined aquifer is generally to the southeast. Depth to groundwater ranged from 4.5 to 11 ft. bgs during the SI. Regional groundwater is generally unconfined and heterogeneous, with highly variable water chemistry and flow. Drinking water is withdrawn from Lake Springfield, located approximately 5 miles southeast of Capital, and supplied to the Base by City Water, Light, and Power.
Brief Description of Receptors:	Activities at the Base have been typical of those at most airports and military air bases, including fueling and maintenance operations. These activities are consistent with industrial/commercial receptor scenarios. A well inventory conducted for the PA shows 55 wells within a one-mile radius of the Capital ANGB. Four of these wells are engineering test wells and 17 are monitoring wells. The remaining 34 wells appear to be private wells utilized for agricultural or domestic use. Within one mile downgradient of the base (southeast), multiple private wells and no public water supply system wells were identified. PFAS including PFOA, PFOS, and PFBS have been detected at multiple on-site monitoring wells at varying concentrations.

Groundwater Worksheet

Installation: Capital ANGB

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

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOS	0.0678	0.04	1.7
PFOA	0.219	0.04	5.5
PFBS	0.079	0.602	0.1

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	7.3
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: Capital ANGB

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

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.0381	0.126	0.3
PFOA	0.00114	0.126	0.0
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**0.3**
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**	**L**

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:	Capital ANGB	**Date:**	9/9/2021
Location (State):	Illinois	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	Wash Rack - PRL 3	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Macrina Xavier	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	The Wash Rack is located outside of Building P19, Vehicle Maintenance, and is currently covered. The Wash Rack is identified in the Site Inspection report as PRL 3. The Wash Rack is a covered, concrete pad with a single drain in the center. It is surrounded by asphalt and grassy areas. According to Base personnel, occasionally AFFF would be removed from Buildings P1 (PRL 1) and P26 (PRL 2) with a vacuum truck following testing. The contents of the vacuum truck would then be emptied on the Wash Rack. The Wash Rack drains to the sanitary sewer via an OWS. During the preliminary assessment (PA) site visit, it was noted that the Wash Rack was small, and there was soil staining surrounding the pad.
Brief Description of Pathways:	Surface soil at Capital ANGB is present as maintained grass surrounding buildings and adjacent to paved areas. Surface runoff at Capital ANGB is collected in a series of storm drains, open ditches, and drainage swales. This runoff joins the airport's storm drain system and the outfall (outside of Base boundary) flows into Lightfoot Creek. No surface water features are present within the current Base boundary. Groundwater flow in the shallow, unconfined aquifer is generally to the southeast. Depth to groundwater ranged from 4.5 to 11 ft. bgs during the SI. Regional groundwater is generally unconfined and heterogeneous, with highly variable water chemistry and flow. Drinking water is withdrawn from Lake Springfield, located approximately 5 miles southeast of Capital, and supplied to the Base by City Water, Light, and Power.
Brief Description of Receptors:	Activities at the Base have been typical of those at most airports and military air bases, including fueling and maintenance operations. These activities are consistent with industrial/commercial receptor scenarios. A well inventory conducted for the PA shows 55 wells within a one-mile radius of the Capital ANGB. Four of these wells are engineering test wells and 17 are monitoring wells. The remaining 34 wells appear to be private wells utilized for agricultural or domestic use. Within one mile downgradient of the base (southeast), multiple private wells and no public water supply system wells were identified. PFAS including PFOA, PFOS, and PFBS have been detected at multiple on-site monitoring wells at varying concentrations.

Groundwater Worksheet

Installation: Capital ANGB

Site ID: PRL 3 **AFFF Release Area #:** AFFF 3

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOS	2.39	0.04	59.8
PFOA	1.62	0.04	40.5
PFBS	1.92	0.602	3.2

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	103.4
CHF > 100	H (High)		
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		

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

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: Capital ANGB

Site ID: PRL 3 **AFFF Release Area #:** AFFF 3

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.621	0.126	4.9
PFOA	0.00654	0.126	0.1
PFBS	0.00156	1.9	0.0
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**5.0**
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:	Capital ANGB	**Date:**	9/9/2021
Location (State):	Illinois	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	Former Fire Station (Building 25) - PRL 5	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Macrina Xavier	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	Building 25 was utilized as the fire station from 1987 until 2011. Since then the building has been completely remodeled. Former Fire Station (Building 25) is identified in the SI report as PRL 5. While in operation, the fire department had four crash trucks and one trailer containing AFFF. The volume of each truck was unknown at the time of the site visit. No known releases of AFFF occurred within the building, however the vehicles were cleaned and refilled with AFFF in the engine bay of the fire station. If AFFF was spilled during refilling, it would have been rinsed to the trench drains which discharge to the sanitary sewer via an OWS. When the building was remodeled, a concrete pit which acted as a grease trap, was found in-line with the trench drains. During the remodeling, the pit was cleaned and removed. Soil was sampled at the time of removal; however, it was not analyzed for PFAS.
Brief Description of Pathways:	Surface soil at Capital ANGB is present as maintained grass surrounding buildings and adjacent to paved areas. Surface runoff at Capital ANGB is collected in a series of storm drains, open ditches, and drainage swales. This runoff joins the airport's storm drain system and the outfall (outside of Base boundary) flows into Lightfoot Creek. No surface water features are present within the current Base boundary. Groundwater flow in the shallow, unconfined aquifer is generally to the southeast. Depth to groundwater ranged from 4.5 to 11 ft. bgs during the SI. Regional groundwater is generally unconfined and heterogeneous, with highly variable water chemistry and flow. Drinking water is withdrawn from Lake Springfield, located approximately 5 miles southeast of Capital, and supplied to the Base by City Water, Light, and Power.
Brief Description of Receptors:	Activities at the Base have been typical of those at most airports and military air bases, including fueling and maintenance operations. These activities are consistent with industrial/commercial receptor scenarios. A well inventory conducted for the PA shows 55 wells within a one-mile radius of the Capital ANGB. Four of these wells are engineering test wells and 17 are monitoring wells. The remaining 34 wells appear to be private wells utilized for agricultural or domestic use. Within one mile downgradient of the base (southeast), multiple private wells and no public water supply system wells were identified. PFAS including PFOA, PFOS, and PFBS have been detected at multiple on-site monitoring wells at varying concentrations.

Groundwater Worksheet

Installation: Capital ANGB

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

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOS	13.1	0.04	327.5
PFOA	0.373	0.04	9.3
PFBS	0.238	0.602	0.4

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	337.2
CHF > 100	H (High)		
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		

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

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: Capital ANGB

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

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.0206	0.126	0.2
PFOA	0.000308	0.126	0.0
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**0.2**
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	
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:	Capital ANGB	**Date:**	9/9/2021
Location (State):	Illinois	**Media Evaluated:**	Groundwater
Site Name and ID:	Stormwater Sewer System - PRL 6	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Macrina Xavier	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	Surface runoff at Capital ANGB is collected in the stormwater sewer system which is comprised of a series of storm drains, open ditches, and drainage swales. The Stormwater Sewer System is identified in the SI report as PRL 6. This runoff joins the airport's storm drain system and the stormwater outfall (along the eastern Base Boundary) and flows into Lightfoot Creek, a tributary of Spring Creek.
Brief Description of Pathways:	Surface soil at Capital ANGB is present as maintained grass surrounding buildings and adjacent to paved areas. Surface runoff at Capital ANGB is collected in a series of storm drains, open ditches, and drainage swales. This runoff joins the airport's storm drain system and the outfall (outside of Base boundary) flows into Lightfoot Creek. No surface water features are present within the current Base boundary. Groundwater flow in the shallow, unconfined aquifer is generally to the southeast. Depth to groundwater ranged from 4.5 to 11 ft. bgs during the SI. Regional groundwater is generally unconfined and heterogeneous, with highly variable water chemistry and flow. Drinking water is withdrawn from Lake Springfield, located approximately 5 miles southeast of Capital, and supplied to the Base by City Water, Light, and Power.
Brief Description of Receptors:	Activities at the Base have been typical of those at most airports and military air bases, including fueling and maintenance operations. These activities are consistent with industrial/commercial receptor scenarios. A well inventory conducted for the PA shows 55 wells within a one-mile radius of the Capital ANGB. Four of these wells are engineering test wells and 17 are monitoring wells. The remaining 34 wells appear to be private wells utilized for agricultural or domestic use. Within one mile downgradient of the base (southeast), multiple private wells and no public water supply system wells were identified. PFAS including PFOA, PFOS, and PFBS have been detected at multiple on-site monitoring wells at varying concentrations.

Groundwater Worksheet

Installation: Capital ANGB

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

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOS	0.108	0.04	2.7
PFOA	0.354	0.04	8.9
PFBS	0.0256	0.602	0.0

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	11.6
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**