FINAL
Preliminary Assessment Report
Silver Bell Army Heliport
Marana, Arizona

Perfluorooctanesulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) Impacted Sites
ARNG Installations, Nationwide

September 2020

Prepared for:

Army National Guard Bureau
111 S. George Mason Drive
Arlington, VA 22204

UNCLASSIFIED

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Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AC	Aircraft
ADEMA	Arizona Department of Emergency and Military Affairs
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
AECOM	AECOM Technical Services, Inc.
AFFF	Aqueous Film Forming Foam
AFRC	Armed Forces Reserve Center
AMA	Active Management Area
amsl	Above Mean Sea Level
AOI	Area of Interest
ARNG	Army National Guard
ASLD	Arizona State Land Development
AZ	Arizona
AZARNG	Arizona Army National Guard
AZNG	Arizona National Guard
bgs	Below Ground Surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CSM	Conceptual Site Model
EDR™	Environmental Data Resources, Inc.™
FEMA	Federal Emergency Management Agency
ft	Feet
FTA	Fire Training Area
JLUS	Joint Land Use Study
NGWA	National Ground Water Association
NOAA	National Oceanic and Atmospheric Administration
NRCD	Natural Resource Conservation District
NRCS	National Resource Conservation Service
PA	Preliminary Assessment
PFAS	Per- and Poly-fluoroalkyl Substances
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid
SBAH	Silver Bell Army Heliport
SI	Site Inspection
UCMR3	Unregulated Contaminant Monitoring Rule 3
US	United States
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

VSI	Visual Site Inspection
WAATS	Western Army National Guard Aviation Training Site
WWTP	Waste Water Treatment Plant

Executive Summary

The Army National Guard (ARNG) is performing Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) Impacted Sites at ARNG Facilities Nationwide. A PA for per- and polyfluoroalkyl substances (PFAS)-containing materials was completed for Arizona ARNG (AZARNG) Silver Bell Army Heliport (SBAH) (also referred to as the "facility"), near the town of Marana, Arizona, to assess potential PFAS release areas and exposure pathways to receptors. The performance of this PA included the following tasks:

- Reviewed available administrative record documents and Environmental Data Resources, Inc. (EDR)™ report packages to obtain information relevant to potential PFAS releases, such as: drinking water well locations, historical aerial photographs, Sanborn maps, and environmental compliance actions in the area surrounding the facility.
- Conducted a site visit on 9 November 2018 and completed visual site inspections (VSIs) at locations where PFAS-containing materials were suspected of being stored, used, or disposed.
- Interviewed current and former SBAH personnel including the SBAH Deputy and Assistant Deputy Chief, Former Fire Chief, SBAH Site Safety Officer, and SBAH Plant Supervisor during the site visit.
- Identified Area(s) of Interest (AOIs) and developed a preliminary conceptual site model (CSM) to summarize potential source-pathway-receptor linkages of potential PFAS in soil, groundwater, surface water, and sediment for each AOI.

Four AOIs related to PFAS releases were identified at SBAH during the PA. The AOIs are shown on **Figure ES-1** and described in **Table ES-1** below. The preliminary CSM for SBAH is presented in **Figure ES-2**.

Table ES-1: AOIs at SBAH

Area of Interest	Name	Used by	Assumed Release Dates^
AOI 1	Building L4320	AZARNG	2009 - 2018
AOI 2	Building L4300	AZARNG	1985 – 1994; 2006 - 2009
AOI 3	Northeastern Boundary Release Locations	AZARNG	2004, 2007, 2011, 2017, 2018
AOI 4	Alpha, Bravo, Charlie Rows	AZARNG	2003/2004,

^ In many instances, actual release dates were not available. The release dates have been assumed based on occupancy and use of the building.

Interviews with SBAH staff whose first-hand knowledge of the facility span 1994 to present indicate that AZARNG activities at SBAH have contributed PFAS contamination to the environment through means of fire-training, fire suppression system releases, maintenance activities, equipment storage, and responses to fuel spills. Based on known AFFF releases at the AOIs listed above, there is potential for exposure to PFAS contamination in media at or near the facility. A summary of PA findings is shown on **Figure ES-1**. The summary preliminary CSM diagram for SBAH is shown on **Figure ES-2**.

The USEPA Unregulated Contaminant Monitoring Rule 3 (UCMR3) data indicate that PFOS/PFOA were not detected in a public water system above the USEPA lifetime Health Advisories within a 20-mile radius of the facility. PFAS analyses performed in 2016 had method detection limits that were higher than currently achievable. Thus, it is possible that low concentrations of PFAS were not detected during the UCMR3 but might be detected if analyzed today.

CLIENT	ARNG			
PROJECT	Preliminary Assessment for PFAS at Silver Bell Army Heliport, AZ			
REVISED	9/15/2020	GIS BY	MS	9/15/2020
SCALE	1:7,200	CHK BY	BL	9/15/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	9/15/2020

N

TITLE

Summary of Findings

AECOM

12420 Milestone Center Drive
Germantown, MD 20876

Figure ES-1

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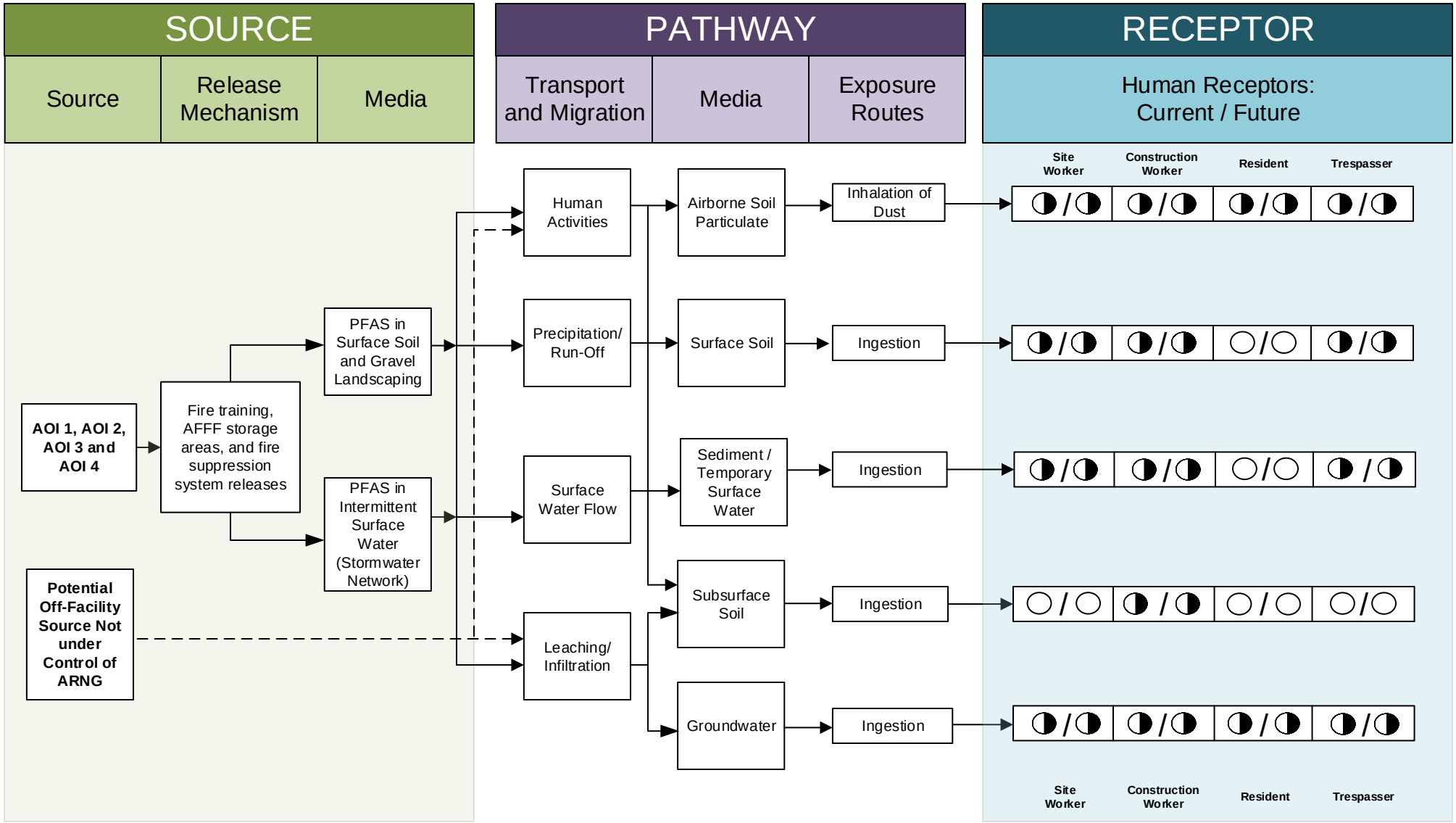


LEGEND

- Flow-Chart Continues
- Partial / Possible Flow
- Incomplete Pathway
- Potentially Complete Pathway
- Complete Pathway

Figure ES-2
Preliminary Conceptual Site Model
Silver Bell Army Heliport

1. Introduction

1.1 Authority and Purpose

The Army National Guard (ARNG) G9 is the lead agency in performing *Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) Impacted Sites at ARNG Facilities Nationwide*. This work is supported by the United States (US) Army Corps of Engineers (USACE) Baltimore District and their contractor AECOM Technical Services, Inc. (AECOM) under Contract Number W912DR-12-D-0014, Task Order W912DR17F0192, issued 11 August 2017.

The ARNG is assessing potential effects on human health related to processes at their facilities that used per- and poly-fluoroalkyl substances (PFAS), primarily releases of aqueous film forming foam (AFFF) released as part of firefighting activities, although other sources of PFAS are possible. In addition, the ARNG is assessing businesses or operations adjacent to the ARNG facility (not under the control of ARNG) that could potentially be responsible for a PFAS release.

PFAS are classified as emerging environmental contaminants that are garnering increasing regulatory interest due to their potential risks to human health and the environment. PFAS formulations contain highly diverse mixtures of compounds. Thus, the fate of PFAS compounds in the environment varies. The US Environmental Protection Agency (USEPA) issued lifetime Drinking Water Health Advisories for PFOA and PFOS in May 2016, but there are currently no promulgated national standards regulating PFAS. In the absence of federal standards for PFAS in any environmental media, some states have adopted their own drinking water standards for PFAS; the state of Arizona does not currently have promulgated standards for PFAS in any environmental media.

This report presents the findings of a PA for PFAS-containing materials at the Arizona ARNG (AZARNG) Silver Bell Army Heliport (SBAH) (also referred to as the “facility”), near the town of Marana, Arizona, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations [CFR] Part 300), and Army requirements and guidance.

This PA documents the locations where PFAS may have been released into the environment at SBAH. The term PFAS will be used throughout this report to encompass all PFAS chemicals being evaluated, including PFOS and PFOA, which are key components of AFFF.

1.2 Preliminary Assessment Methods

The performance of this PA included the following tasks:

- Reviewed available administrative record documents and Environmental Data Resources, Inc. (EDR)™ report packages to obtain information relevant to potential PFAS releases, such as: drinking water well locations, historical aerial photographs, Sanborn maps, and environmental compliance actions in the area surrounding the facility.
- Conducted a site visit on 9 November 2018 and completed visual site inspections (VSIs) at locations where PFAS-containing materials were suspected of being stored, used, or disposed.

- Interviewed current and former SBAH personnel during the site visit including the SBAH Deputy and Assistant Deputy Chief, Former Fire Chief, SBAH Site Safety Officer, and SBAH Plant Supervisor.
- Identified Area(s) of Interest (AOIs) and developed a preliminary conceptual site model (CSM) to summarize potential source-pathway-receptor linkages of potential PFAS in soil, groundwater, surface water, and sediment for each AOI.

1.3 Report Organization

This report has been prepared in accordance with the USEPA *Guidance for Performing Preliminary Assessments under CERCLA* (1991 USEPA). The report sections and descriptions of each are as follows:

- **Section 1** – **Introduction:** identifies the project purpose and authority and describes the facility location, environmental setting, and methods used to complete the PA
- **Section 2** – **Fire Training Areas:** describes the potential or suspected FTAs at the facility identified during the site visit
- **Section 3** – **Non-Fire Training Areas:** describes other locations of potential or suspected PFAS releases at the facility identified during the site visit
- **Section 4** – **Emergency Response Areas:** describes areas of suspected or potential AFFF release at the facility, specifically in response to emergency situations
- **Section 5** – **Adjacent Sources:** describes sources of PFAS release adjacent to the facility that are not under the control of ARNG
- **Section 6** – **Preliminary Conceptual Site Model:** describes the pathways of PFAS transport and receptors at the facility
- **Section 7** – **Conclusions:** summarizes the data findings and presents the conclusions of the PA
- **Section 8** – **References:** provides the references used to develop this document
- **Appendix A** – Data Resources
- **Appendix B** – Preliminary Assessment Documentation
- **Appendix C** – Photographic Log

1.4 Facility Location and Description

SBAH is approximately 170 acres of land located 2.85 miles west of Interstate 10 and northeast of East Pinal Air Park Road, which is north of the city of Marana in Pinal County, Arizona (**Figure 1-1**).

SBAH is located north of Pinal Airpark, which was constructed as the Marana Army Airfield in 1942. After World War II, the Airfield was deeded to Pinal County. The Airfield was a flying school and a base for covert Central Intelligence Agency air operations. Later, the Airfield became known as the Pinal Airpark. Since 1979, tenants at the Pinal Airpark have provided passenger and cargo services along with aircraft maintenance, storage, reconfiguration, and reclamation services. Today, the primary occupant of the Airpark is Evergreen Air Center, which serves as a “boneyard” for civilian commercial aircraft, as well as airliner storage, reconfiguration, and reclamation.

Undeveloped desert landscape bounds SBAH to the west, north, and east. SBAH is largely developed with buildings, roads, and an airfield.

The land occupied by SBAH was conveyed by the US to the state of Arizona in 1913. In 1983, 161 acres of land were patented by the Arizona State Land Department (ASLD) to the Arizona Department of Emergency and Military Affairs (ADEMA) for SBAH. By 1987, an armory and an Army aviation support facility (AASF) (L4600) had been constructed on SBAH property. In 2005, ADEMA leased 565 acres of land surrounding SBAH from ASLD (AZARNG, 2005; AZARNG, 2010). By 2010, SBAH had over 300,000 square feet (ft) of office space, hangars, and storage facilities (AZARNG, 2010).

1.5 Facility Environmental Setting

SBAH is located in the central Tucson Basin, within the Basin and Range physiographic province, a landscape of the interior western US that is dominated by mountain ranges separated by broad alluvial valleys (Thornbury, 1965). The facility lies within the Yuma Desert portion of the Sonoran Desert region of Arizona at an elevation of about 1,893 ft above mean sea level (amsl). The Tortolita Mountains to the east, Tucson Mountains to the west, and the Picacho Mountains to the north rise to elevations of about 4,000 to 4,500 ft amsl. Local, unnamed, intermittent washes drain west to the Santa Cruz River, which is about 2 miles southwest of the facility. The Santa Cruz River flows intermittently, except in short stretches fed by reclaimed effluent from wastewater treatment plants (WWTP). During prehistoric times, and as late as the beginning of the twentieth century, the river was a much more reliable source of surface water or shallow groundwater (URS, 2008).

Topographic variability in the region creates environmental zones with varying resources (Fish et. al, 1985; Goodyear, 1975; Minckley and Brown, 1982). In the valley bottom, the Santa Cruz River was once a reliable source of water, and the floodplain and adjacent terraces had arable land. A variety of grasses and cacti covered the lower bajadas (alluvial fans), and paloverde-mixed cacti communities, rich in saguaro and other edible cacti, grew on the upper bajadas and around mountain bases. Washes radiating out of the mountains had distinctive xeroriparian vegetation communities that crossed the bajadas. The mountains had diverse woodland and grassland environments that supported deer and other large mammals and were a source of rocks for flaked and ground stone tools; the mountains also had springs that provided water. Natural vegetation has been eliminated from the adjacent developed areas of SBAH and Pinal Air Park (URS, 2008).

1.5.1 Geology

Soil information was obtained from the Web Soil Survey website maintained by the Natural Resources Conservation Service of the US Department of Agriculture (National Resource Conservation Service [NRCS], 2015). Using this tool, soil on the facility was identified as “Denure sandy loam, 1 to 3 percent slopes.” (NRCS, 2015). Denure sandy loams are deep, somewhat excessively drained soil found on fan terraces. The Denure sandy loams formed in fan alluvium derived from mixed sources. This soil unit is used as rangeland agriculture (Natural Resource Conservation District [NRCD], 1991).

SBAH is located within the Upper Santa Cruz Sub-Basin of the Tucson Basin. This Basin contains undivided Quaternary surficial deposits consisting of valley fill or alluvium varying up to 12,000 ft in thickness. The alluvium varies in constitution from dense sand, gravel, and cobble deposits to silts and clays. In many areas, deposits of heavily cemented sandy clay and clayey sand (caliche) are encountered (AZARNG, 2005).

The alluvium and rock of the Tucson Basin include three major units that form a single, unconfined aquifer: Fort Lowell Formation, Tinaja Beds, and Pantano Formation. The Fort Lowell Formation, which comprises the upper 300 to 400 ft, provides most of the groundwater that is withdrawn from the basin. This Formation includes interbedded silt, sand, and gravel. The Tinaja Beds underlie the Fort Lowell Formation and are separated from the Fort Lowell Formation by an aquitard. The Tinaja Beds are comprised of a layer of sand and gravel underlain by gypsiferous clayey silt and mudstones. The Pantano Formation underlies the Tinaja Beds at depths of several thousand ft in the central portion of the Basin. The Pantano Formation is a reddish-brown silty sandstone that overlies bedrock (AZARNG, 2005).

1.5.2 Hydrogeology

SBAH is located within the Tucson Active Management Area (AMA) aquifers. The main aquifer in this area is the Fort Lowell Formation. Groundwater in the vicinity of SBAH flows to the northwest. Depth to groundwater ranged from 200 to 300 ft below ground surface (bgs) during 1994-1995 and is suspected to be influenced by surface water infiltration from nearby irrigated fields (Hammet, 1995). The area is characterized by very little direct recharge to groundwater due to very low annual rainfall.

Beginning in the 1970s, many municipalities required stormwater to be retained and disposed onsite at newly developed commercial or industrial properties. Depending upon specific development and drainage conditions, drywells were a common method used to dispose of stormwater. Drywells are regulated under the Safe Drinking Water Act. The Arizona Department of Environmental Quality (ADEQ) maintains a searchable database of drywells (ADEQ, 2019).

The following registration numbers and names are associated with drywells at SBAH (ADEQ, 2019):

- 52217 (6 wells) – Silver Bell Flood Mitigation
- 45031 (4 wells) – Silver Bell WWTP Upgrade
- 44460 (1 well) – Silver Bell Airfield at AFRC [Armed Forces Reserve Center]
- 45659 (1 well) – AZ Army National Guard – AFRC
- 8563 (1 well) – Silver Bell Armory HO 1st BN 285th

Six drywells are located within the stormwater drainage ditches along the northeastern property line, installed as flood mitigation. Four drywells are located within the northwestern cell of the wastewater retention basin, installed as part of the WWTP upgrade. Three other registered drywells exist on-facility, two associated with the AFRC and one associated with the Armory, for a total of 13 drywells registered with ADEQ at SBAH.

According to the Arizona Department of Water Resources (ADWR) well registry and the EDR™ report, there are five groundwater wells within 1-mile of SBAH (ADWR, 2019; **Appendix A**). Two wells are on-facility, and the remaining three are off-facility. The wells are described in **Table 1-1** below.

Table 1-1: On- and Off-Facility Wells at SBAH

Registration Number	Owner	Location/Direction from SBAH Geographical Center	Well Depth (ft bgs)	Water Level (ft bgs)	Use	Pump Rate (gpm)	On-Facility/ Off-Facility
55-213034	Arizona Emergency & Military Affairs Department	~0.49 miles SE	610	200	Mixed	Unknown	On-facility
55-507748	Div Military AFF-AZ	~0.20 miles E	610	230	Mixed	80	On-facility
55-577144	Evergreen Air Center	~0.70 miles WSW	250	220	Monitor	N/A	Off-facility
55-615698 (co-located with 55-618728)	Arizona State Land Department	~0.60 miles N	400	219	Mixed	5	Off-facility
55-618728 (co-located with 55-615698)	Arizona Board of Regents	~0.60 miles N	400	300	Mixed	Unknown	Off-facility

Notes:
N = north
E = east
SE = southeast
WSW = west-southwest
gpm = gallons per minute
N/A = Not Applicable

SBAH has two groundwater extraction wells: 55-213034 and 55-507748. The former is located on the southeastern installation boundary, under the overhead protection (L4503) and behind the FMO South facility (L4512), and the latter is located east of the former fire station, Aircraft (AC) Maintenance Hangar, and surrounding area (L4300) and south of WAATS Hangar (L4525) (**Figure 1-2**). Groundwater from these wells is used for potable drinking water, fire suppression, irrigation, and activities related to the mission. Groundwater extraction rates provided by ADWR are available from 1984 to 2015 for well 55-507748.The average annual extracted groundwater between 2011 and 2015 was 16.6 acre-ft (5,409,126 gallons).

The USEPA Unregulated Contaminant Monitoring Rule 3 (UCMR3) data indicate that PFOS/PFOA were not detected in a public water system above the USEPA Health Advisories within a 20-mile radius of the facility. PFAS analyses performed in 2016 had method detection limits that were higher than currently achievable. Thus, it is possible that low concentrations of PFAS were not detected during the UCMR3 but might be detected if analyzed today.

Geologic, groundwater, and surface water features interact with and influence one another, and as such are all shown on **Figure 1-2**.

1.5.3 Hydrology

SBAH is within the city of Marana-Santa Cruz River watershed, which consists of approximately 58 square miles of the Lower Santa Cruz watershed in Pinal and Pima Counties. The watershed lies within a flat plain and includes a drainage area that is predominantly undisturbed desert. The facility is located on a broad, flat, alluvial fan east of the Santa Cruz River. The area is characterized by a low-energy erosional environment stabilized by large creosote bushes and mesquite trees (Harris Group Inc, 2004).

The surface topographic gradient near the facility is less than 15 ft per mile to the west-northwest. The nearest significant natural drainage feature, the Santa Cruz River, is located approximately 2 miles west of SBAH (US Geological Survey [USGS], 1996). The nearest wetland is located 1.75 miles west-southwest of SBAH. This wetland is categorized as a "freshwater forested/shrub wetland" (US Fish and Wildlife Service [USFWS], 2015).

SBAH is located in Zone X, according to data from the Federal Emergency Management Agency's Flood Map Service Center. Zone X is defined as, "areas of 0.2% annual chance flood; areas of 1% chance annual flood with average depth of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.". A floodplain is located approximately 0.75 mile west of SBAH. This floodplain is characterized as a, "special flood hazard areas subject to inundation by the 1% annual chance flood." (Federal Emergency Management Agency [FEMA], 2015).

There are no naturally occurring surface water features at SBAH (**Figure 1-3**). Surface water collecting features at SBAH include the following:

- A two-celled wastewater retention basin located in the northwestern corner of SBAH; and
- A stormwater retention basin located in the northwestern corner of SBAH, adjacent to the west of the wastewater retention basin.

SBAH contains several locations where surface runoff and stormwater are collected and ultimately diverted to the stormwater retention basin in the northwestern corner of the facility. These features generally run along the northeastern, northwestern, southwestern, and southeastern perimeter of SBAH. The stormwater collection system is closed, and collected water does not cross SBAH property boundaries. Collected water is removed from SBAH by a combination of evaporation and infiltration.

SBAH has a WWTP (L4710) capable of treating approximately 100,000 gallons per day that is located in the southern point of the base (VERSAR, 2010). The WWTP (L4710) was built in 2008 and came online in 2010. The WWTP (L4710) discharges to a two-celled wastewater retention basin located in the northwestern corner of the SBAH, adjacent and to the east of the stormwater retention basin. Effluent from the WWTP (L4710) is discharged to the northwestern-most cell, which contains five drywells that transport the water to the subsurface for infiltration. Wastewater flow is contained within the bounds of SBAH property, although waste sludge produced by the WWTP (L4710) is removed from SBAH property and disposed of at an approved waste facility, as required (ADEMA, 2015).

The stormwater and wastewater retention basins are located in the northwestern corner of SBAH (**Figure 1-3**). The geographic coordinates at the approximate center of the stormwater basin are 32°31'25.0" N; 111°20'18.8" W. The geographic coordinates at the approximate center of the wastewater retention basins are 32°31'29.3" N; 111°20'17.3" W and 32°31'27.7" N; 111°20'15.4" W for the northern and southern cells, respectively. According to aerial photographs, the

stormwater retention basin has existed at SBAH since approximately June 1996. The wastewater retention basins were constructed between August 2006 and June 2007.

The stormwater retention basin is approximately 286,625 square ft and does not have an outlet, therefore, captured stormwater remains within SBAH property boundaries. The northern and southern wastewater retention basin cells are approximately 47,000 square ft each. The drywells located within the wastewater retention basins direct reclaimed WWTP effluent into the shallow subsurface.

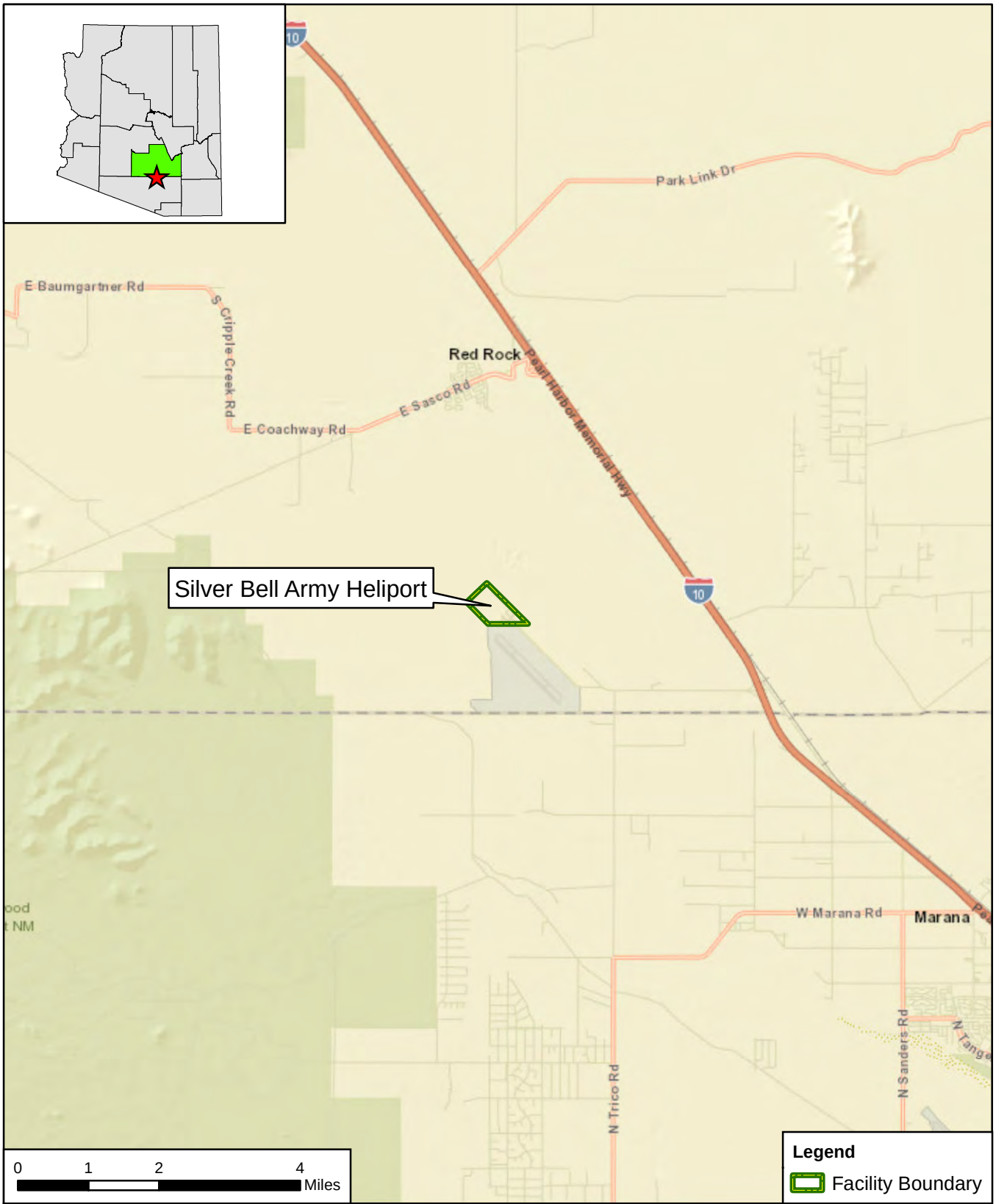
The stormwater retention basin and drainage network receive all of the stormwater and run-off generated from within the SBAH boundary. The water is removed from the network via surface infiltration and evaporation. According to the 2018 EDR™ report, SBAH site topography has an elevational change of approximately 12 ft across the facility from north to south (1865 to 1877 ft amsl) and an elevational change of approximately 32 ft across the facility from west to east (1856 to 1888 ft amsl) (EDR™, 2018). The facility's topological features suggest surface water would flow to the northwest, towards the stormwater retention basin located in the northwestern corner of the facility.

1.5.4 Current and Future Land Use

At the time of this report, Pinal County, in conjunction with the Arizona National Guard (AZNG), is conducting a Joint Land Use Study (JLUS). The Pinal County JLUS is a collaborative effort between the military and surrounding communities working to promote compatible and sustainable growth within Pinal County, while simultaneously preserving the mission of the AZNG (Pinal County, 2018). The current land use of SBAH is specifically designated by Pinal County as "Airport Reserve", with the functions being industrial/military. The Pinal Airpark and SBAH lie within Pinal County's Red Rock Growth Area, as outlined in the county's Comprehensive Plan, with the objective of facilitating mixed use development and a diverse economic center in southern Pinal County (Pinal County, 2015). The future land use of SBAH is not proposed for change.

1.5.5 Climate

SBAH is located within the Sonoran Desert, which has a warm steppe climate characterized by low precipitation and high evapotranspiration rates. Precipitation varies depending on location over the course of a year, but the region is generally arid, and the Tucson Basin receives only about 12 inches of precipitation annually. Summer rainfall (June through August) accounts for 30 to 60 percent of the yearly precipitation, while winter rains and occasional snow account for 10 to 40 percent of the annual total (Sellers and Hill, 1974) (URS, 2008). The maximum average monthly temperature in nearby Eloy, AZ occurs in July (105.7degrees Fahrenheit [°F]), with an average maximum annual temperature of 87.7 °F. The minimum average monthly temperature occurs in December (35.2 °F), with an average minimum annual temperature of 53.5 °F (National Oceanic and Atmospheric Administration [NOAA], 2019). The average annual precipitation in Eloy, AZ from 1971-2000 was 10.60 inches (NOAA, 2019).



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Silver Bell Army Heliport, AZ			
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SCALE	1:126,720	CHK BY	BL	7/2/2019
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	7/2/2019

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Facility Location

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 1-1

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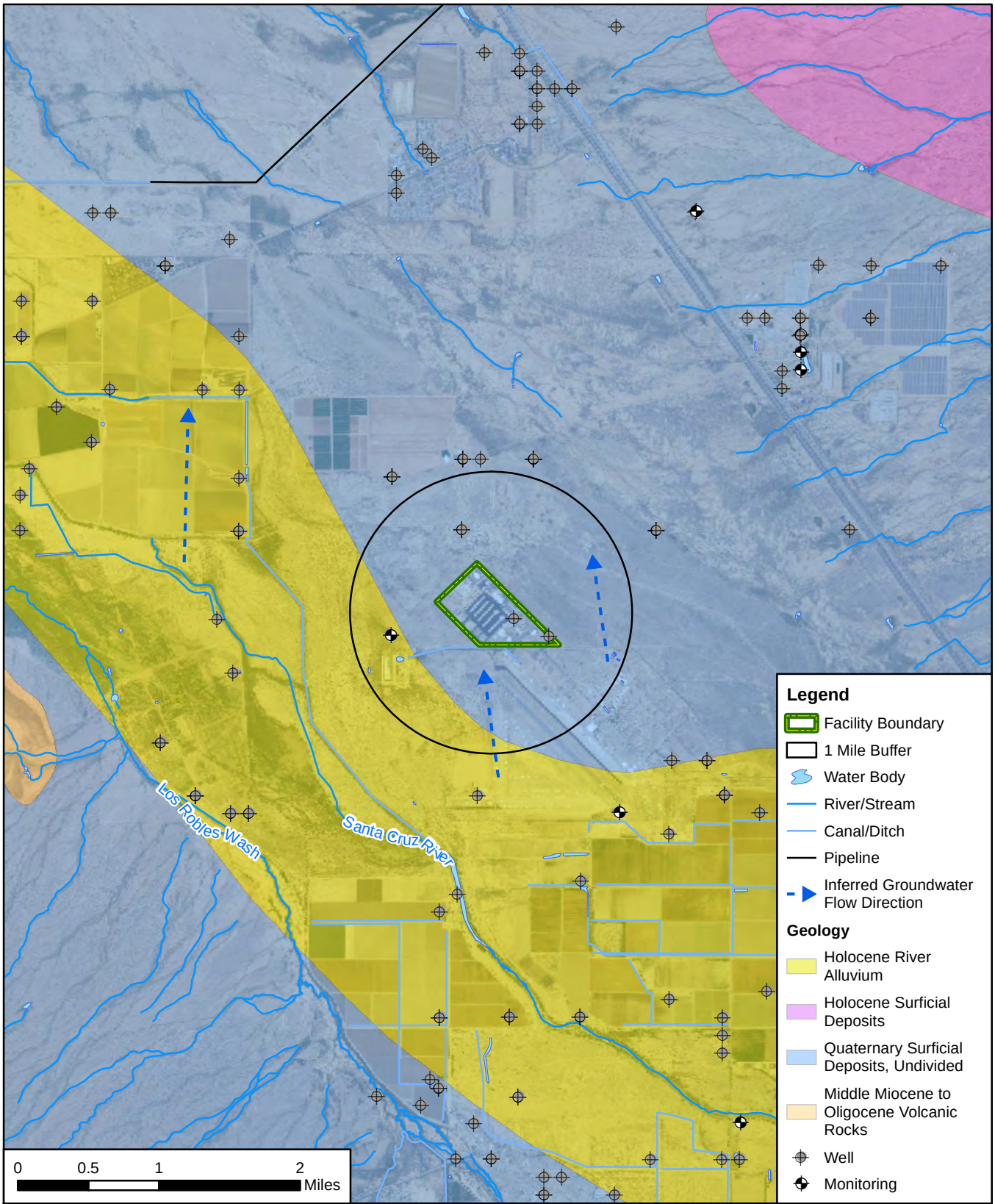

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NOTES	Preliminary Assessment for PFAS at Silver Bell Army Heliport, AZ			
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SCALE	1:63,360	CHK BY	BL	7/2/2019
Base Map: National Agricultural Imagery Program, 2016.		PM	RG	7/2/2019

Groundwater Features

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 1-2

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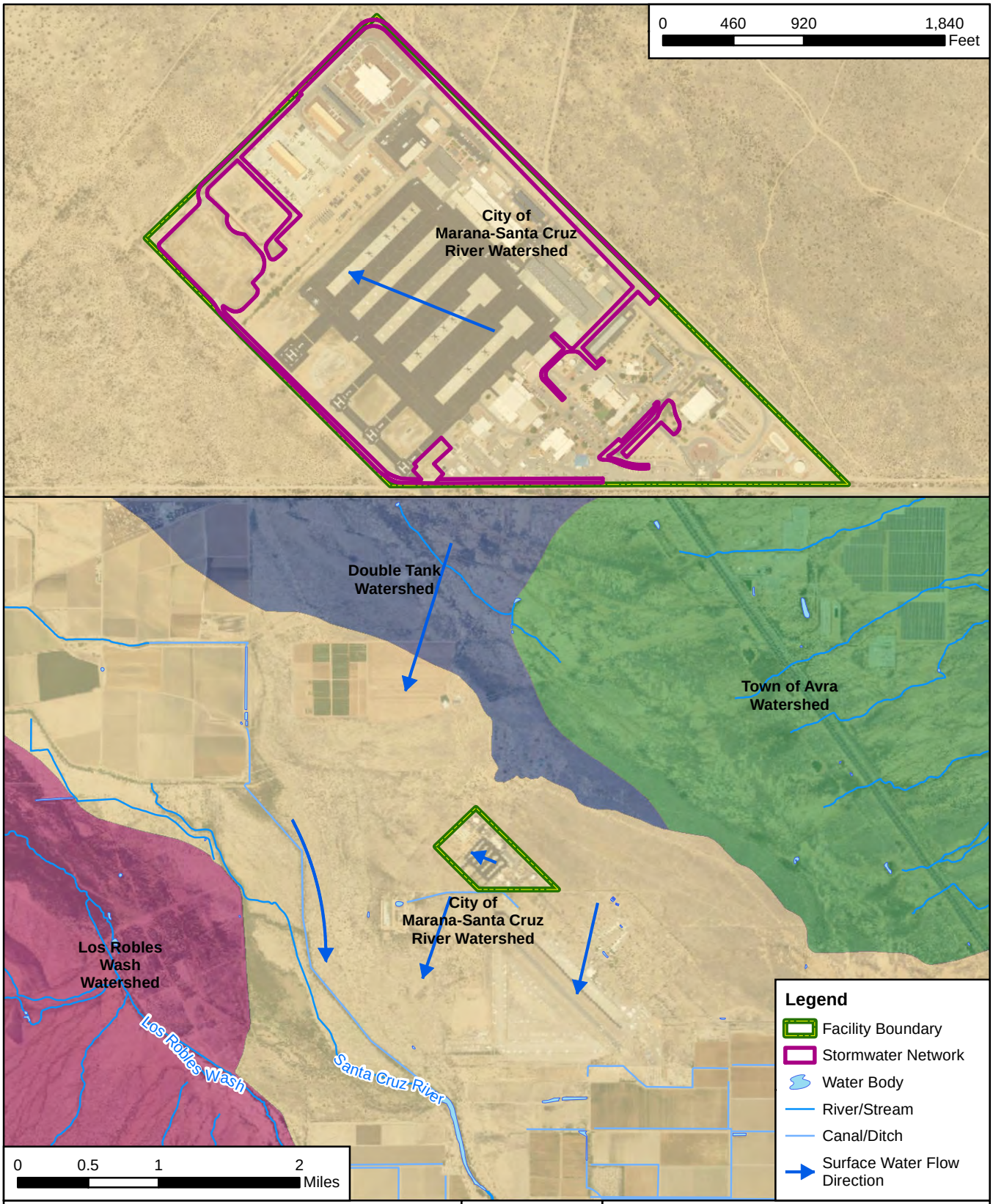

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SCALE	1:63,360	CHK BY	BL	7/2/2019
Base Map:		PM	RG	7/2/2019

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Surface Water Features

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 1-3

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2. Fire Training Areas

FTAs are considered areas where fire training events deliberately using AFFF or other fire-fighting materials resulted in a release to the environment. This excludes separate areas where the deliberate discharge of AFFF for disposal or maintenance purposes occurred, and those areas are discussed in **Section 3**. Five FTAs were identified during the PA (**Figure 2-1)**. These include the Singapore Hangar (L4650), a Wash Rack and Drain (L4603) located to the southeast of the Singapore Hangar (L4650), the AASF #2 hangar (L4600), the former fire station driveway, AC Maintenance Hangar and Surrounding Area (L4300), and the current fire station (L4320) driveway and surrounding area also located along the southeastern apron border. Available photographs of the FTAs are presented in **Appendix C**. A discussion of the five FTAs identified is presented below.

2.1 Building L4650 - Exterior

The Singapore Hangar (L4650) is located in the northern corner of SBAH and directly south of the fuel farm (**Figure 2-1**). The geographic coordinates at the approximate center of the hangar structure are 32°31'31.1" N; 111°20'01.5" W. The Singapore Hangar (L4650) was constructed in 2009 and supports joint operations between US forces and visiting international forces.

SBAH personnel stated that fire training activities occur in front of the building. According to interviewees, the last training in this area was in October 2018. The area used for fire training is assumed to be along the concrete apron on the south side of the Singapore Hangar (L4650).

Fire training performed annually at this FTA consists of discharging AFFF from one to two Tri-Max™ mobile fire extinguishers, per event, at small objects set ablaze. Tri-Max™ solution is directly sprayed onto the concrete apron and is not contained using booms or similar products. After training, Tri-Max™ solution is washed away using water. AFFF sprayed during training may travel to the stormwater retention basin, the landscaping gravel planter adjacent to the concrete apron, and/or the wash rack drain located approximately 75 ft southeast of the Singapore Hangar (L4650) apron.

The Singapore Hangar (L4650) has landscaping gravel along the northeastern perimeter, asphalt paving along the southeastern perimeter, a concrete apron and landscaping gravel along the southwestern perimeter, and asphalt paving along the northwestern perimeter. Stormwater drainage features are not located in the immediate area of the facility, and the nearest drainage feature is a small, singular retention basin located approximately 300 ft to the west. The retention basin does not have any outlets and has one inlet located on the southeast side (in the direction of the Singapore Hangar [L4650]). Additional information regarding activities not associated with fire training at the Singapore Hangar (L4650) are discussed further in **Section 3.1**

2.2 Building L4603

The Wash Rack and Drain (L4603) is located between the Singapore Hangar (L4650) and the AASF #2 (L4600). The geographic coordinates at the approximate center of the Wash Rack and Drain (L4603) structure are 32°31'38.8" N; 111°20'00.8" W. Aerial photographs indicate the Wash Rack and Drain (L4603) has been in operation since 2003. Though the intended purpose of the Wash Rack and Drain (L4603) is for daily use of vehicle cleaning operations, the Aviation Life Support Equipment Supervisor stated during interviews that the Wash Rack and Drain (L4603) may have occasionally been used for fire training with Tri-Max™ mobile fire extinguishers.

Fire training is believed to have occurred on the tarmac near the Wash Rack and Drain (L4603), allowing discharged AFFF to be washed down the drain. The type of training performed on the tarmac near the Wash Rack and Drain (L4603) is similar to that performed at the Singapore Hangar (L4650), where one to two Tri-Max™ mobile fire extinguishers would be used to extinguish small fires per event.

The Wash Rack and Drain (L4603) is covered only by a shade canopy. The ground surface at the Wash Rack and Drain (L4603) is a concrete extension of the AASF #2 (L4600) apron. The surface is sloped inward to a singular drain, allowing for liquid removal via piping directed to the WWTP (L4710). The Wash Rack and Drain (L4603) has asphalt along the northwest and southwest perimeters, concrete along the southeast perimeter, and bare earth to the northeast. The nearest stormwater feature to the Wash Rack and Drain (L4603) is the singular retention basin approximately 400 ft east-northeast.

Although the Wash Rack and Drain (L4603) has a drain directing fluids to the WWTP (L4710), it is possible that environmental releases of PFAS have occurred at the Wash Rack and Drain (L4603) due to cracks and/or leaks in the surface concrete or drainage piping to the WWTP (L4710). Furthermore, depending on the location of fire training exercises performed at the Wash Rack and Drain (L4603), the unpaved area to the northeast may have been exposed to liquids containing PFAS.

Additional information regarding activities not associated with fire training at the Wash Rack and Drain (L4603) is further described in **Section 3.2**.

2.3 Building L4600 - Exterior

AASF #2 (L4600) is located along the northeastern boundary of the SBAH and directly southeast of the Singapore Hangar (L4650) and Wash Rack and Drain (L4603) (**Figure 2-1**). The geographic coordinates at the approximate center of AASF #2 (L4600) are 32°31’26.4” N; 111°19’56.3” W. Aerial photographs indicate that AASF #2 (L4600) was constructed in 1995 and supports SBAH AZARNG operations. There are three fire suppression systems among eight bays within AASF #2 (L4600). SBAH personnel stated during interviews that annual fire training with one to two Tri-Max™ training mobile fire extinguishers per event occurred annually on the asphalt southwest of the concrete apron at AASF #2 (L4600) until several years ago; the timeframe in which annual training occurred is unknown.

Depending on the exact location of fire training at AASF #2 (L4600), AFFF may have discharged southeast towards a stormwater drainage ditch located southeast of the apron.

AASF #2 (L4600) has a concrete apron to the southwest along the building’s perimeter, bare earth and asphalt along the northwest perimeter, an asphalt road and bare earth along the northeastern perimeter, and bare earth bounded by an asphalt paved parking lot along the southeastern perimeter. The nearest stormwater features are a drainage ditch located approximately 300 ft northeast and the singular retention basin located approximately 650 ft northwest from the AASF #2 (L4600), respectively. Additionally, the Wash Rack and Drain (L4603) (**Section 2.2, Section 3.2**) is located approximately 250 ft west-northwest of the AASF #2 (L4600). There is also a singular drain associated with a spill pad (L4622) located approximately 400 ft south-southeast of the AASF #2 (L4600).

Additional information regarding activities not associated with fire training at AASF #2 (L4600) is further described in **Section 3.3**.

2.4 Building L4300

The former fire station driveway, AC Maintenance hangar, and surrounding area (L4300) are located along the southeastern border of the tarmac and consist of a long asphalt driveway with gravel planters on either side of the driveway. The former fire house occupies a small space in the northern most portion of the AC Maintenance hangar (L4300) (**Figure 2-1**). There is a shade canopy directly in front of the former fire house along the driveway. The driveway is approximately 100 ft long, 35 ft wide, and the approximate geographic coordinates of the center are 32°31'17.8" N; 111°19'56.3" W. This portion of the AC Maintenance hangar (L4300) previously operated as a fire station between 1985 to 1994, then again from 2006 to 2009. This portion of the building is currently used as classrooms for SBAH personnel. The building was not equipped with a fire suppression system and did not have floor drains. Fire training activities and equipment inspection were performed on the driveway and within the surrounding gravel areas.

SBAH personnel stated that foaming occurs in the former FTA area during significant rainfall. Tri-Max™ mobile fire extinguishers were discharged and refilled semi-annually at the former fire station (L4300) during its use as an FTA, but the exact timeframe of fire training there is unknown, although it likely coincides with the operation as a fire station (1985 -1994; 2006 – 2009). Fire training and maintenance activities ceased at FTA when the fire station was relocated to the current fire station (L4320). Training at the former fire station (L4300) involved using one to two mobile Tri-Max™ units to extinguish small fires per event. Training is believed to have occurred on the building driveway.

The former fire station driveway, AC Maintenance hangar, and surrounding area (L4300) are surrounded predominantly by unpaved areas and landscaping gravel and conjoins with the AC Maintenance hangar (L4300) to the southwest and an asphalt driveway to the northwest (**Appendix C**, photographs number 1-3)**.** The asphalt driveway connects to the asphalt tarmac and is surrounded by areas of landscaping gravel. An asphalt paved parking lot is located beyond the bare earth to the southeast. The nearest stormwater feature is approximately 175 ft to the east of the geographic center of the former fire station driveway. The gravel area on either side of the driveway directs drainage to either the northeast or southwest of the building. This stormwater drainage feature is connected to the SBAH-wide drainage channel, and flow within this feature ultimately deposits into the stormwater retention basin located in the northwestern corner of SBAH (**Figure 3-1**). The landscaping gravel on either side of the driveway is without vegetation and is slightly lower in elevation than the driveway.

Based on visual inspection and descriptions of the fire training and maintenance activities, PFAS releases to the environment at the former fire station driveway, AC Maintenance hangar, and surrounding area (L4300) have occurred within the asphalt driveway and surrounding landscaping gravel. It is possible that sufficient rainfall may cause ponding in the area, allowing PFAS overflow from the landscaping gravel to the stormwater feature to the east. Additionally, inspection of aerial photos of this area suggests that water from the gravel areas routinely overflows to the northeast drainage ditch. There is an observable flow channel through the gravel and a linear stain feature on the asphalt to the drainage channel.

Additional information regarding activities not associated with fire training at the former fire station driveway, AC maintenance hangar and surrounding area (L4300) are discussed further in **Section 3.4**

2.5 Building L4320 - Exterior

The current fire station (L4320) is located approximately 350 ft southwest of the AC Maintenance Hangar (L4300) (**Section 2.4)**, along the southeastern border of the tarmac (**Figure 2-1**). The current fire station (L4320) consists of a large building, an asphalt and gravel driveway, and surrounding bare earth and landscaping gravel planters. The driveway is approximately 90 ft long, 60 ft wide, and the geographic coordinates of the approximate center are 32°31'14.6" N; 111°19'59.6" W. The building is equipped with a fire suppression system and has three drains in each one of its three bays (9 drains in total). The SBAH utility map indicates these drains connect to the WWTP (L4710). Fire training was performed in front of the current fire station and within the surrounding gravel areas at the current fire station.

Potential AFFF releases to the environment are suspected to have occurred in this area due to fire training activities.

Training occurred outside and in front of the current fire station (L4320). The former Fire Chief at Marana Army Airfield stated during interviews that one to two Tri-Max™ units were used monthly for fire training purposes. Fire training activities at the current fire station (L4320) began when it became operational in 2009 until late in 2018.

The nearest stormwater feature to the current fire station (L4320) is approximately 50 ft to the west of the geographic center of the fire station driveway (**Appendix C**, photograph number 5). This stormwater feature acts as a basin for tarmac run-off in the southern portion of SBAH. The basin is split into two portions by an asphalt and gravel driveway and hydrologically connected via a culvert beneath the asphalt and gravel driveway. This stormwater drainage feature is connected to the SBAH-wide drainage channel, and flow within this feature is directed along the western property boundary to ultimately discharge into the stormwater retention basin located in the northwestern corner of SBAH (**Figure 2-1**). The landscaping gravel on the eastern side of the driveway is without vegetation and is slightly lower in elevation than the driveway. The stormwater basin to the west of the current fire station (L4320) driveway is sparsely vegetated with tall grass and is slightly lower in elevation than the fire station driveway.

Based on historical fire training, the current fire station (L4320) driveway and surrounding area FTA includes the entire length of the asphalt and gravel driveway, the immediate areas of landscaping gravel on either side of the driveway, and in front of the current fire station (L4320) building where the fire training activities occurred. PFAS releases to the environment in this area occurred within the asphalt and gravel driveway and surrounding landscaping gravel. PFAS released on the driveway and the landscape gravel may have infiltrated the subsurface via the stormwater drainage feature located within the stormwater collection basin to the west of the fire station.

Additional information regarding activities not associated with fire training at the current fire station driveway (L4320) is discussed further in **Section 3.5**.

CLIENT	ARNG			
PROJECT	Preliminary Assessment for PFAS at Silver Bell Army Heliport, AZ			
REVISED	9/15/2020	GIS BY	MS	9/15/2020
SCALE	1:7,200	CHK BY	BL	9/15/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	9/15/2020

N

TITLE

Fire Training Areas

AECOM

12420 Milestone Center Drive
Germantown, MD 20876

Figure 2-1

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3. Non-Fire Training Areas

In addition to the FTAs, the PA evaluated areas where PFAS-containing materials may have been broadly used, stored, or disposed. This may include buildings with fire suppression systems, paint booths, AFFF storage areas, and areas of compliance demonstrations. Information on these features obtained during the PA are included in **Appendices A** and **B**. The PA site visit identified seven non-FTAs where AFFF was intentionally or unintentionally released to the environment: the Singapore Hangar (L4650), the Wash Rack and Drain (L4603), AASF #2 (L4600), the former fire station driveway, AC maintenance hangar, and surrounding area (L4300), the current fire station (L4320), the former fire station (L4601), and the Western Army National Guard Aviation Training Site (WAATS) Maintenance Hangar (L4605). Non-FTAs are shown on **Figure 3-1**. Available photographs of each non-FTA identified during the PA are presented in **Appendix C.**

3.1 Building L4650

The fire suppression system within the Singapore Hangar (L4650) was initially tested following the hangar's construction in 2009. The foam filled about 6 feet high within the hangar bays and was pushed out the door towards the tarmac and allowed to evaporate. According to SBAH personnel, the Singapore Hangar (L4650) fire suppression system has been tested annually since then by a contractor, though no releases have occurred. The contractor states that all additional annual testing has been performed without releases, and that samples are pulled directly from the bladder.

Based on visual inspection and descriptions of the maintenance activities, PFAS releases to the environment at the Singapore Hangar (L4650) could have occurred. The initial test release could have reached the spill pad drain and/or the stormwater drainage ditch. The location of Singapore Hangar (L4650) is depicted on **Figure 3-1**.

3.2 Building L4603

Various types of helicopters, wheeled vehicles, and large aircraft parts are washed at the Wash Rack and Drain (L4603). Additionally, SBAH personnel stated with confidence during interviews that helicopters covered with AFFF were washed at the Wash Rack and Drain (L4603) during a release of the fire suppression system at AASF #2 (L4600).

Although the Wash Rack and Drain (L4603) has a drain directing fluids to the WWTP (L4710), it is possible that environmental releases of PFAS have occurred at the Wash Rack (L4603) due to cracks and/or leaks in the surface concrete or drainage piping to the WWTP (L4710). The location of the Wash Rack and Drain is depicted on **Figure 3-1**.

3.3 Building L4600

The fire suppression system at AASF #2 (L4600) has been triggered on multiple occasions, resulting in releases of AFFF. SBAH personnel indicated that the automatic fire suppression system was unintentionally triggered in 2004 and 2007. The fire suppression system pipes leaked AFFF to the floor of the AASF #2 (L4600) in 2004. The AFFF was mopped up using a Zamboni and pushed towards a trench drain that extends the entire length of building L4600. The spill pad drain and the hangar trench drain transported fluids to a former retention pond where Singapore Hangar (L4650) is located. In 2007, AFFF solution filled the fire riser room due to a malfunction; the solution was directed to the asphalt roads and unpaved areas northeast of AASF #2 (L4600), leaking out of the Paint Room and Machine Room. It is unclear if the solution reached the

stormwater drainage ditch. Additionally, the volume of AFFF released during both unintentional fire suppression system trigger events is unknown.

Based on visual inspection and descriptions of the maintenance activities and unintentional releases from the fire suppression system, PFAS were released to the environment at AASF #2 (L4600). The releases could have reached the spill pad drain, the former retention pond, and/or the stormwater drainage ditch, as described above. The location of AASF #2 is depicted on **Figure 3-1**.

3.4 Building L4300

In addition to the fire training that occurred at the former fire station driveway, AC maintenance hangar, and surrounding area (L4300), Tri-Max™ maintenance and recharge were performed along the driveway and in the landscaping gravel adjacent to the driveway. The maintenance and recharge included discharging the contents of the Tri-Max™ units onto the ground surface and replacing the Tri-Max™ solution via a 5-gallon bucket. Based on the description of these activities, the Tri-Max™ maintenance area is considered to be the entire length of the asphalt driveway and the immediate areas of landscaping gravel on either side of the driveway.

Based on visual inspection and descriptions of the maintenance activities, PFAS releases to the environment at the former fire station, AC Maintenance hangar, and surrounding area (L4300) have occurred within the asphalt driveway and surrounding landscaping gravel. It is possible that sufficient rainfall may cause ponding in the area, allowing PFAS overflow from the landscaping gravel to the stormwater feature to the east. The location of the former fire station driveway, AC maintenance hangar, and surrounding area (L4300) is depicted on **Figure 3-1**.

3.5 Building L4320

In addition to the fire training that occurred at the current fire station (L4320), equipment storage, Tri-Max™ storage, and equipment maintenance all occurred in this area. Fire equipment inspections were performed on the driveway and within the surrounding gravel and sparsely vegetated areas at the current fire station driveway and surrounding areas (L4320). Additionally, Tri-Max™ mobile fire extinguishers and other AFFF equipment are currently stored along the western edge of the driveway (**Appendix C**, photograph number 4).

The current fire station (L4320) maintains six firefighting vehicles as well as equipment designed to suppress aircraft fires. In addition, firefighting equipment and materials are stored on unpaved areas adjacent to a CONEX box approximately 90 ft south of the geographic center of the fire station driveway (**Figure 3-1**). The approximate geographic coordinates of the storage area are 32°31’13.6” N; 111°19’59.7” W. The 500 square ft storage area is unsheltered. Firefighting materials have been stored in this area since 2009. Several Tri-Max™ units, ladders, fire extinguisher canisters, compressed gases, and hoses are stored in this area. Materials are stored on the ground between a chain-link fence and the metal CONEX box (**Appendix C**, photograph number 8). Potential AFFF releases to the environment are suspected to have occurred in this area due to leaks from Tri-Max™ units, fire extinguishers, and material canisters located in the storage area. The total volume of stored AFFF materials at the current fire station (L4320) is generally between three to five 55-gallon drums at any one time.

Maintenance and storage activities at the current fire station (L4320) began when the current fire station (L4320) became operational in 2009 until late in 2018. Tri-Max™ maintenance and recharge are performed along the driveway and on the landscaping gravel on the side of the driveway. These activities included discharging the contents of the Tri-Max™ onto the ground

surface and replacing the Tri-Max™ solution via a 5-gallon bucket. According to SBAH personnel, for more than 12 years, the contractor changed the solution in the Tri-Max™ units every six months. The process of decommissioning Tri-Max™ units included drilling holes in the old units and dumping the solution in the unpaved area southwest of the current fire station (L4320). SBAH personnel approximated 100 units per year were dumped in this area.

Vehicles containing AFFF are also maintained and stored within the bays at the current fire station (L4320). Maintenance activities of these vehicles consist of nozzle testing and spraying, purging and refilling AFFF storage on vehicles along with washing and servicing of fire trucks and other similar activities. Vehicles are refilled with AFFF using a pump. According to SBAH personnel, AFFF leaked from a fire truck within the fire house and drained through the bay floor drain. The date of this leak and volume of AFFF released is unknown.

The nearest stormwater feature to the current fire station (L4320) is approximately 50 ft to the west of the geographic center of the fire station driveway. The grassy/gravel area directs drainage either northeast or southwest of the building, where it flows into the main surface water collection system. This stormwater feature acts as a basin for tarmac run-off in the southern portion of SBAH. The basin is split into two portions by an asphalt and gravel driveway and hydrologically connected via a culvert beneath the asphalt and gravel driveway. This stormwater drainage feature is connected to the SBAH-wide drainage channel, and flow within this feature is directed along the western property boundary to ultimately discharge into the stormwater retention basin located in the northwestern corner of SBAH (**Figure 4-1**). The landscaping gravel on the eastern side of the driveway is without vegetation and is lower in elevation than the driveway. The stormwater basin to the west of the current fire station (L4320) driveway is sparsely vegetated with tall grass and is slightly lower in elevation than the fire station driveway.

Based on historical maintenance and equipment storage activities at the current fire station (L4320), PFAS releases to the environment in this area occurred within the asphalt and gravel driveway and surrounding landscaping gravel and fire station. PFAS released on the driveway and the landscape gravel may have infiltrated the subsurface via the stormwater drainage feature located within the stormwater collection basin to the west of the fire station, where it would then travel to the stormwater retention basin, and then infiltrate groundwater. Any PFAS released within the fire station were likely removed via the bay drains that direct fluids to the on-site WWTP (L4710) and ultimately the WWTP (L4710) retention ponds.

3.6 Building L4601

The SBAH former fire station (L4601) is located between the AASF #2 Hangar (L4600) and WAATS Hangar (L4605) (**Figure 3-1**). The geographic coordinates at the approximate center of the former fire station (L4601) are 32°31’25.3” N; 111°19’55.3” W. Historical aerial imagery suggests that the former fire station (L4601) was constructed in 1994 and was used as a fire station until 2006. Activities associated with the maintenance and storage of firefighting equipment were conducted within this facility while it operated as a fire station.

According to SBAH personnel, the former fire station (L4601) did not have a fire suppression system or drains. Although unverified, PFAS releases may have occurred at the former fire station (L4601) during its operational years as a fire station based on common activities performed at other SBAH fire stations, such as the maintenance and storage of firetrucks. It is therefore assumed that potential AFFF releases at the former fire station (L4601) would have entered the environment through the spill pad drain and the building’s surrounding areas.

In June 2003, the fire station (L4601) was surrounded by unpaved areas to the northwestern, northeastern, and southeastern perimeter, and surrounded by asphalt on the southwestern perimeter. Currently, the fire station (L4601) is surrounded by asphalt on all sides with the exception of small unpaved areas on the northwestern and northeastern perimeters. These unpaved areas are approximately 13 ft wide. The asphalt on the southwestern perimeter of the fire station (L4601) directly connects to the asphalt tarmac. The nearest stormwater feature is a spill pad (L4622) approximately 150 ft southwest from the geographic center of the building. The spill pad (L4622) is a concrete pad with a drain below the ground surface that leads to the WWTP.

3.7 Building L4605

The WAATS Hangar (L4605) is located along the northeastern boundary of SBAH and directly southeast of AASF #2 (L4600) and the former fire station (L4601) (**Figure 3-1**). The geographic coordinates at the approximate center of the WAATS Hangar (L4605) are 32°31'23.3" N; 111°19'52.3" W. Historical aerial photographs indicate the WAATS Hangar (L4605) was constructed between 2004 and 2005. The WAATS Hangar at (L4605) has 10 bays and is equipped with a multi-zone fire suppression system. PFAS releases at the WAATS Hangar (L4605) are depicted in **Table 3-1** below.

Table 3-1: PFAS Releases at Building L4605

Date of Release	Location of Release	Cause of Release	Volume of Release
April 2011	Northeast (Back)	Unintentional	Unknown
April 2017	Fire Riser Room, Northeast (Back)	Seal in fire suppression system failed	Unknown
May 2018	"Old Paint Booth" Sheet Metal Shop, Northeast (Back)	Accident due to mislabel during fire suppression system check	Unknown
July 2018	Fire Riser Room, Northeast (Back)	Seal in fire suppression system failed	Unknown

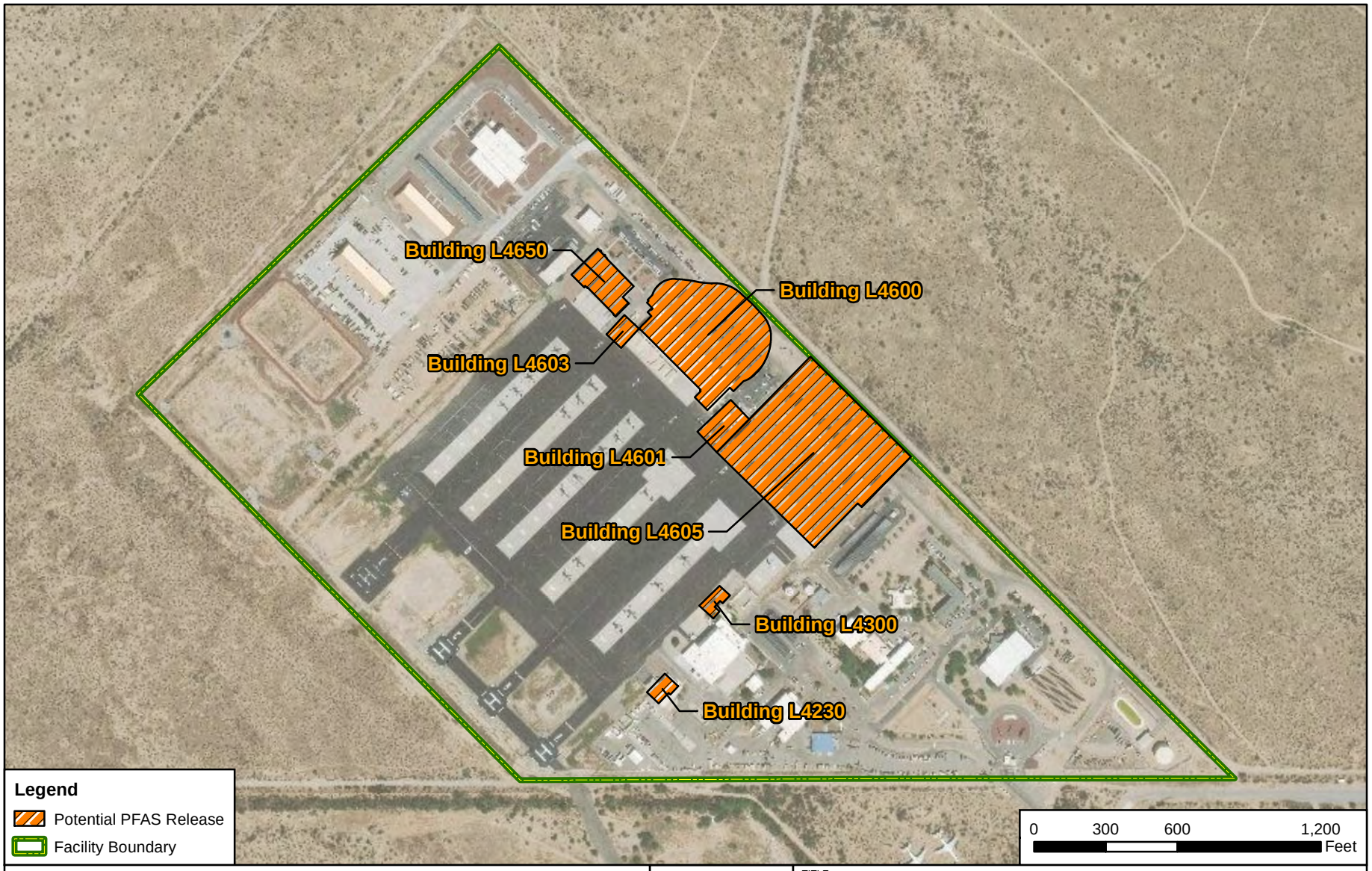
SBAH personnel stated during interviews that the automatic fire suppression system at the WAATS Hangar (L4605) unintentionally released AFFF in 2011, April 2017, May 2018, and July 2018. The release in 2011 occurred in the back (northeast) portion of the WAATS Hangar (L4605). The volume of AFFF released is unknown. The released AFFF likely migrated northeast, along the asphalt, towards bare earth behind the WAATS Hangar (L4605). The April 2017 and July 2018 releases occurred in the fire riser room at the rear (northeast) of the WAATS Hangar (L4605). A seal within the fire suppression system failed and caused the fire riser room to fill with AFFF (**Appendix C**, photographs number 12-15 for the 2017 event, and photographs number 16-21 for the 2018 event). The volumes of AFFF released during the April 2017 and July 2018 releases are unknown.

The May 2018 release occurred during a fire system check conducted at the WAATS Hangars (L4605). The fire suppression system was deactivated; however, one riser remained activated

due to improper labeling. When the system was tested, the “old paint booth” riser activated and filled the room with AFFF, though it was no longer the paint booth at that moment, as it was used as the sheet metal shop. The volume of AFFF released is unknown. According to SBAH personnel, the release was squeegeed out, washed out, and pushed out to the gravel area northeast of the building.

The WAATS Hangar (L4605) has a concrete apron along the southwest perimeter, asphalt along the northwestern and northeastern perimeter, and an unpaved area along a portion of the northeastern corner and southeastern perimeter. Bare earth follows the asphalt further to the northeast of the WAATS Hangar (L4605). The nearest stormwater feature(s) are approximately 325 ft to the northeast and southeast of the geographic center of the WAATS Hangar (L4605). Both of these stormwater drainage features are connected to the SBAH-wide drainage channel, and flow within these features will ultimately deposit into the stormwater retention basin located in the northwestern corner of the SBAH (**Figure 3-1**). In addition, the spill pad (L4622) is located approximately 350 ft west-northwest of the geographic center of the WAATS Hangar (L4605).

It is presumed that PFAS entered the environment in the unpaved areas to the northeast of the WAATS Hangar (L4605) as a result of these AFFF releases. Depending on the magnitude of the releases and rainfall following the events, PFAS may have also migrated to the stormwater feature to the northeast and to the stormwater retention basin. Possible staining was identified during the site visit in the bare earth area to the northeast.



CLIENT	ARNG			
PROJECT	Preliminary Assessment for PFAS at Silver Bell Army Heliport, AZ			
REVISED	9/15/2020	GIS BY	MS	9/15/2020
SCALE	1:7,200	CHK BY	BL	9/15/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	9/15/2020

TITLE

Non-Fire Training Areas

AECOM

12420 Milestone Center Drive
Germantown, MD 20876

Figure 3-1

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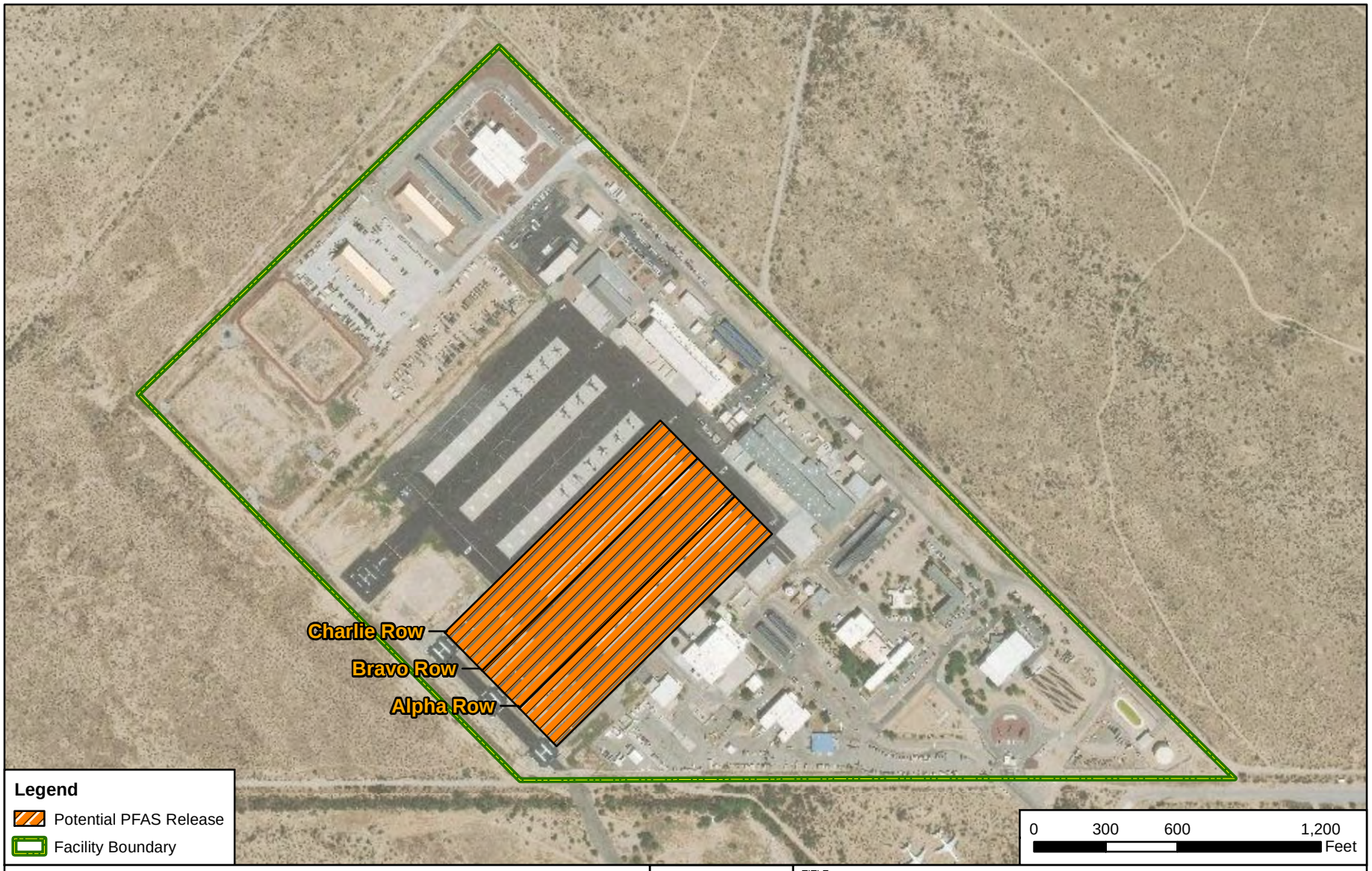
4. Emergency Response Areas

Emergency response locations are often considered potential PFAS release areas because AFFF is commonly used to extinguish crash flames. According to SBAH staff, no crashes or unplanned fires resulting in AFFF use have occurred at SBAH during their tenure; however, two crashes at the adjacent Marana Army Airfield were described during interviews. These crashes are discussed in **Section 5**.

AFFF is commonly used to extinguish aviation fuel-related fires. Several fuel spills have occurred on the tarmac at SBAH. AFFF was used to control a fire or fire-potential at spills in the Alpha, Bravo, Charlie rows of the tarmac southwest of the AASF #2/WAATS Hangar. The Charlie row spill was speculated by staff to have occurred in 2003 or 2004. The timeframe of the Alpha/Bravo row spill is unknown, though SBAH personnel stated that the asphalt had to be replaced due to the extent of the spill. The volume of AFFF used in response to both events is unknown, and spill records were unavailable during the site visit. Emergency release areas are shown on **Figure 4-1**.

Tri-Max™ units are stored on the facility between each aircraft on the ramp for use during emergency response. At the time of the VSI, 58 Tri-Max™ units were on the ramp, with a historical maximum total of up to 100 units. The Tri-Max™ units have been used at SBAH since 2002 or 2003. Prior to this, large carbon dioxide containers were used for fire suppression on the ramp, though they were not stored on the ramp.



CLIENT	ARNG			
PROJECT	Preliminary Assessment for PFAS at Silver Bell Army Heliport, AZ			
REVISED	9/15/2020	GIS BY	MS	9/15/2020
SCALE	1:7,200	CHK BY	BL	9/15/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	9/15/2020

TITLE

Emergency Response Areas

AECOM

12420 Milestone Center Drive
Germantown, MD 20876

Figure 4-1

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5. Adjacent Sources

Several known and suspected sources of PFAS, not under the control of AZARNG, have been identified within 1 mile of SBAH. These sources include firefighting response to fuel-related spills and fires on Pinal Airpark. The potential adjacent sources are described below, and their locations are presented on **Figure 5-1**.

5.1 Pinal Airpark

According to the 2018 EDR™ report, the center of the Pinal Airpark located approximately 0.5 miles east-southeast of SBAH property boundary (EDR™, 2018). Prior to World War II, the Pinal Airpark was the Marana Army Airfield. It is unknown whether AFFF were stored in fire suppression systems at the Airpark; however, SBAH staff stated during interviews that AFFF has been used during emergency responses along the runway at the Airpark, and releases at Pinal Airpark may impact the groundwater under portions of SBAH. Two incidents have occurred in which AFFF was used at the Airpark:

- A Boeing 747 aircraft caught fire on the Airpark property, approximately 900 ft south-southeast of the current SBAH fire station (L4320). The date of this fire is unknown, but staff confirmed that AFFF was used to extinguish the flames. The volume of AFFF released in response to the fire is unknown, and response records were unavailable for this PA. The approximate location of the Boeing 747 fire is presented on **Figure 5-1**.
- A fuel spill on the Airpark property approximately 4,650 ft southeast of the current fire station (L4320). AFFF was used to control the spill and prevent potential conflagration. The date of this incident is unknown, and the volume of AFFF released in response to the spill is unknown. The approximate location of the fuel spill is presented on **Figure 5-1**.

5.2 Evergreen Air Center

According to the 2018 EDR™ report, the Evergreen Air Center is located approximately 0.4 miles southeast of the SBAH property boundary (EDR™, 2018). The Evergreen Air Center is the primary occupant of Pinal Airpark, which provides airplane maintenance services and storage for non-military aircraft (Turnbull, 2005). It is unknown whether AFFF were ever used at Evergreen Air Center, or if emergency responses using AFFF have occurred at the location. The Evergreen Air Center is included in this section because airplane maintenance and storage facilities commonly use AFFF fire suppression systems and/or use AFFF to address aviation fuel-related fires.

5.3 I-10 Accident Response

According to SBAH personnel, the SBAH fire department has responded to multiple tanker truck fires and crash incidents on I-10 over the years. It was reported that foam was deployed during these emergency responses, although information related to exact locations of response along with the quantity and frequency of AFFF released were unavailable.

CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Silver Bell Army Heliport, AZ			
REVISED	9/15/2020	GIS BY	MS	9/15/2020
SCALE	1:6,000	CHK BY	BL	9/15/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	9/15/2020

N

Adjacent Sources

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 5-1

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6. Preliminary Conceptual Site Model

Based on the findings of this PA, four AOIs have been identified at SBAH: AOI 1 Current Fire Station (L4320), AOI 2 Former Fire Station Driveway, AC Maintenance Hangar, and Surrounding Area (L4300), AOI 3 Northeastern Boundary Release Locations (which encompasses the Singapore Hangar [L4650], Wash Rack and Drain [L4603], AASF #2 [L4600], Former Fire Station [L4601], and WAATS Hangar [L4605]), and AOI 4 Alpha, Bravo, and Charlie rows. An AOI can be the location of a single known or suspected PFAS release or a group of closely related releases on a facility. Off-facility releases are not categorized as AOIs but are noted in the preliminary CSM if there is a potential to impact receptors on the facility. A preliminary CSM is provided for each AOI with a unique set of sources/pathways/receptors. If the preliminary CSM is identical for multiple AOIs, then they are shown on one diagram. The AOI locations are shown on **Figure 6-1**. The following sections describe the CSM components for each AOI identified. Each preliminary CSM identifies the three components necessary for a potentially complete exposure pathway: (1) source, (2) pathway, and (3) receptor. If any of these elements are missing, the pathway is considered incomplete.

Human exposure via the dermal contact pathway may occur, and current risk practice suggests it is an insignificant pathway compared to ingestion; however, exposure data for dermal pathways are sparse and continue to be the subject of PFAS toxicological study (National Ground Water Association [NGWA], 2018). The receptors for the SBAH AOIs include personnel, onsite construction workers, trespassers, and nearby residents. The preliminary CSMs for each AOI discussed indicate which specific receptors could potentially be exposed to PFAS.

6.1 AOI 1 Building L4320

AOI 1 is the current fire station (L4320). Fire training activities described in this area involved setting small materials ablaze and extinguishing the flames using a Tri-Max™ mobile fire extinguisher. Training is believed to have occurred in front of the current fire station (L4320). Maintenance activities of vehicles containing AFFF that also occur here may include nozzle testing, purging and refilling of AFFF storage on vehicles, and other maintenance activities. SBAH personnel also noted an AFFF leak from a firefighting truck to the bay floor drains. Additionally, firefighting equipment and materials are stored on bare earth adjacent to the fire station to the south.

The current fire station (L4320) is surrounded by bare earth and landscaping gravel on all perimeter sides with the exception of a concrete and asphalt driveway to the southeast and an asphalt and gravel driveway to the northwest. A stormwater feature is located approximately 50 ft to the west of the geographic center of the fire station driveway and acts as a basin for tarmac run-off in the southern portion of SBAH. It is possible that AFFF releases during fire training exercises or discharge of expiring AFFF may have resulted in PFAS contamination to surface soil at the AOI. There is limited vegetation in this area, indicating possible fugitive dust emissions are not mitigated by natural surface cover. Therefore, the pathway for potential exposure to PFAS contamination via inhalation of dust particles or ingestion of surface soil during construction or maintenance is considered potentially complete at the AOI. Additionally, these dust particles can travel off-facility, therefore, the pathway for potential exposure to PFAS contamination to residents is considered potentially complete.

PFAS are water soluble and can migrate readily from soil to groundwater or surface water via leaching and run-off. Due to this nature, PFAS impacts may migrate from the initial release area via surface water mobilization and be redeposited as surface water infiltrates or evaporates.

Surface water from precipitation will partly evaporate and infiltrate in areas with permeable surface soils. PFAS released on the driveway and the landscape gravel may have infiltrated the subsurface via the stormwater drain located within the stormwater collection basin to the west of the fire station. Any PFAS released within the fire station was likely removed via the bay drains which direct fluids to the on-site WWTP (L4710) and ultimately the WWTP (L4710) retention ponds.

SBAH receives potable water from two groundwater extraction wells (55-213034 and 55-507748). Extraction well 55-213034 is located in the southeastern corner of SBAH, and extraction well 55-507748 is located east of the AC Maintenance Hangar (L4300) and south of WAATS Hangar (L4525). As such, the pathway for PFAS in groundwater for SBAH facility staff as well as potential facility trespassers is considered potentially complete. Additionally, private wells exist off-facility and down-gradient to the north. Therefore, the pathway for PFAS exposure in drinking water to off-facility receptors is potentially complete. Depth to groundwater at SBAH is observed at approximately 200 ft bgs or deeper. Infiltrating water impacted with PFAS may take a prolonged time before impacting the regional aquifer where groundwater is drawn. In addition, the amount of rain observed at SBAH also limits the volume of water that infiltrates the subsurface.

It is possible that AFFF releases across this area may have resulted in PFAS transport to the SBAH stormwater network. Precipitation on paved surfaces will generally flow overland or be collected by the facility's stormwater network, where it is ultimately discharged to the stormwater retention basin in the northwestern corner of SBAH. Therefore, facility staff and construction workers may be exposed to surface water, and therefore also potentially sediment, at the facility during periods when standing or flowing water exists, or when construction workers make modifications to the drainage system; however, the frequency of significant rain events is low in Arizona. Exposure via surface water and sediment are limited to times when sufficient rain is falling, which can at times result in standing water at site drainages and the stormwater retention basins.

Ground-disturbing activities to subsurface soil at AOI 1 could result in construction worker exposure to potential PFAS contamination via inhalation of dust particles or ingestion of subsurface soil in the unpaved areas surrounding the current fire station (L4320). Additionally, dust particles could potentially migrate off the facility, which could result in potential PFAS contamination via inhalation by nearby residents. Therefore, the exposure pathways for these receptors are potentially complete. The preliminary CSM diagram for AOI 1 is shown on **Figure 6-2.**

6.2 AOI 2 Building L4300

AOI 2 is the former fire station driveway, AC Maintenance Hangar, and surrounding area (L4300). Tri-Max™ mobile fire extinguishers were discharged and refilled semi-annually at the former fire station for an unspecified timeframe during its operation. Based on descriptions of the fire training and maintenance activities, PFAS have been released to the environment within the asphalt driveway and surrounding landscaping gravel.

The former fire station driveway, AC Maintenance Hangar, and surrounding area (L4300) is surrounded predominantly by bare earth and landscaping gravel; it conjoins with the AC Maintenance hangar (L4300) to the southwest and an asphalt driveway to the northwest. It is possible that AFFF that was released at the AOI may have resulted in PFAS contamination to surface soil at the AOI. Like AOI 1, this area is not vegetated, indicating possible fugitive dust emissions are not mitigated by natural surface cover. Therefore, the pathway for potential exposure to PFAS contamination to SBAH staff and construction workers via inhalation of dust

particles or exposure to surface soil during construction or maintenance is considered potentially complete. Additionally, these dust particles can travel off-facility, therefore the pathway for potential exposure to PFAS contamination to residents is considered potentially complete. The existence of AFFF in the area is further evidenced by foaming during significant rainfall. Significant rainfall may cause ponding in the area and overland flow from the landscaping gravel to the stormwater feature to the east.

Due to the presence of dry wells, PFAS may be transported to the subsurface and into groundwater. As such, the pathway for PFAS in groundwater to facility staff and construction workers as well as potential facility trespassers is considered potentially complete. The presence of private wells north and downgradient from SBAH also signifies that the pathway for PFAS exposure to off-facility receptors via drinking water is potentially complete.

It is possible that AFFF releases across this area have resulted in PFAS transport to the SBAH stormwater network. Precipitation on paved surfaces will generally flow overland or be collected by the facility's stormwater network infrastructure, where it is ultimately discharged to the stormwater retention basin in the northwestern corner of SBAH. Therefore, facility staff and construction workers may be exposed to surface water, and therefore also potentially sediment, at the facility during periods when standing or flowing water exists at the facility; however, the frequency of significant rain events is low in Arizona. Exposure via surface water and sediment are limited to times when sufficient rain is falling and, therefore, reduces the exposure potential of site and construction workers to near negligible.

Ground-disturbing activities to subsurface soil at AOI 2 could result in construction worker exposure to potential PFAS contamination via inhalation of dust particles or ingestion of subsurface soil in the bare earth areas surrounding the former fire station driveway, AC Maintenance Hangar, and surrounding area (L4300) or during drainage system modification work. Additionally, dust particles could potentially migrate off the facility, which could result in potential PFAS contamination via inhalation by nearby residents. Therefore, the exposure pathways for these receptors are potentially complete. The preliminary CSM diagram for AOI 2 is shown on **Figure 6-2.**

6.3 AOI 3 Northeastern Boundary Release Locations

AOI 3 consists of the Singapore Hangar (L4650), the Wash Rack and Drain (L4603), AASF #2 (L4600), the former fire station (L4601), and the WAATS Hangar (L4605). Fire training using mobile Tri-Max™ fire extinguishers resulted in AFFF releases at the Singapore Hangar (L4650), the Wash Rack and Drain (L4603), AASF#2 (L4600), and the former fire station (L4601). Additionally, fire suppression systems have released AFFF at AASF #2 (L4600) and the former fire station (L4601).

AOI 3 includes three adjacent large buildings along the northeast SBAH property boundary with the large concrete apron to the southwest. Bare earth exists along northeastern perimeters of the buildings with the exception of the Singapore Hangar (L4650), which is bounded by landscaping gravel along its northeastern perimeter.

AFFF releases during fire training activities at the Singapore Hangar (L4650) and AASF #2 (L4600) likely occurred on the concrete apron and surrounding areas (including the concrete spill pad [L4622] and Wash Rack and Drain [L4603]). AFFF that was released from the fire suppression system at AASF #2 (L4600) was directed towards asphalt roads and bare earth areas northeast of the hangar. AFFF releases during fire training activities at the former fire station (L4601) were likely captured and drained to the WWTP (L4710); however, it is possible the surrounding area

may have been impacted by AFFF. AFFF released by the fire suppression system at the WAATS Hangar (L4605) likely migrated towards bare earth east-northeast and entered the drainage system.

AFFF released at buildings across this AOI may have resulted in PFAS contamination to surface soil at. None of these locations have vegetation, indicating possible fugitive dust emissions are not mitigated by natural surface cover. Therefore, the pathway for potential exposure to PFAS contamination to SBAH staff and construction workers via inhalation of dust particles or exposure to surface soil during construction or maintenance is considered potentially complete. Additionally, these dust particles can travel off-facility, therefore the pathway for potential exposure to PFAS contamination to residents is considered potentially complete.

It is possible that AFFF releases across this area may have resulted in PFAS transport to the SBAH stormwater network. Precipitation on paved surfaces will generally flow overland or be collected by the facility's stormwater network infrastructure, where it is ultimately discharged to the stormwater retention basin in the northwestern corner of SBAH. Therefore, facility staff and construction workers may be exposed to surface water, and therefore also sediment, at the facility during periods when standing or flowing water exists at the facility; however, the frequency of significant rain events is low in Arizona. Exposure via surface water and sediment are limited to times when sufficient rain is falling and, therefore, reduces the exposure potential of site and construction workers to near negligible.

PFAS may have also been transported to subsurface soil and groundwater via dry wells in the SBAH stormwater network. Because drinking supply wells exist at the facility, the pathway for PFAS in groundwater to facility staff and construction workers as well as potential facility trespassers is potentially complete. Additionally, private wells exist off-facility and downgradient to the north. Therefore, the pathway for PFAS exposure in drinking water to off-facility receptors is potentially complete.

Ground-disturbing activities to subsurface soil at AOI 3 could result in construction worker exposure to potential PFAS contamination via inhalation of dust particles or ingestion of subsurface soil in the unpaved areas across the AOI. Additionally, dust particles could potentially migrate off the facility, which could result in potential PFAS contamination via inhalation by nearby residents. Therefore, the exposure pathways for these receptors are potentially complete. The preliminary CSM diagram for AOI 3 is shown on **Figure 6-2.**

6.4 AOI 4 Alpha, Bravo, and Charlie Rows

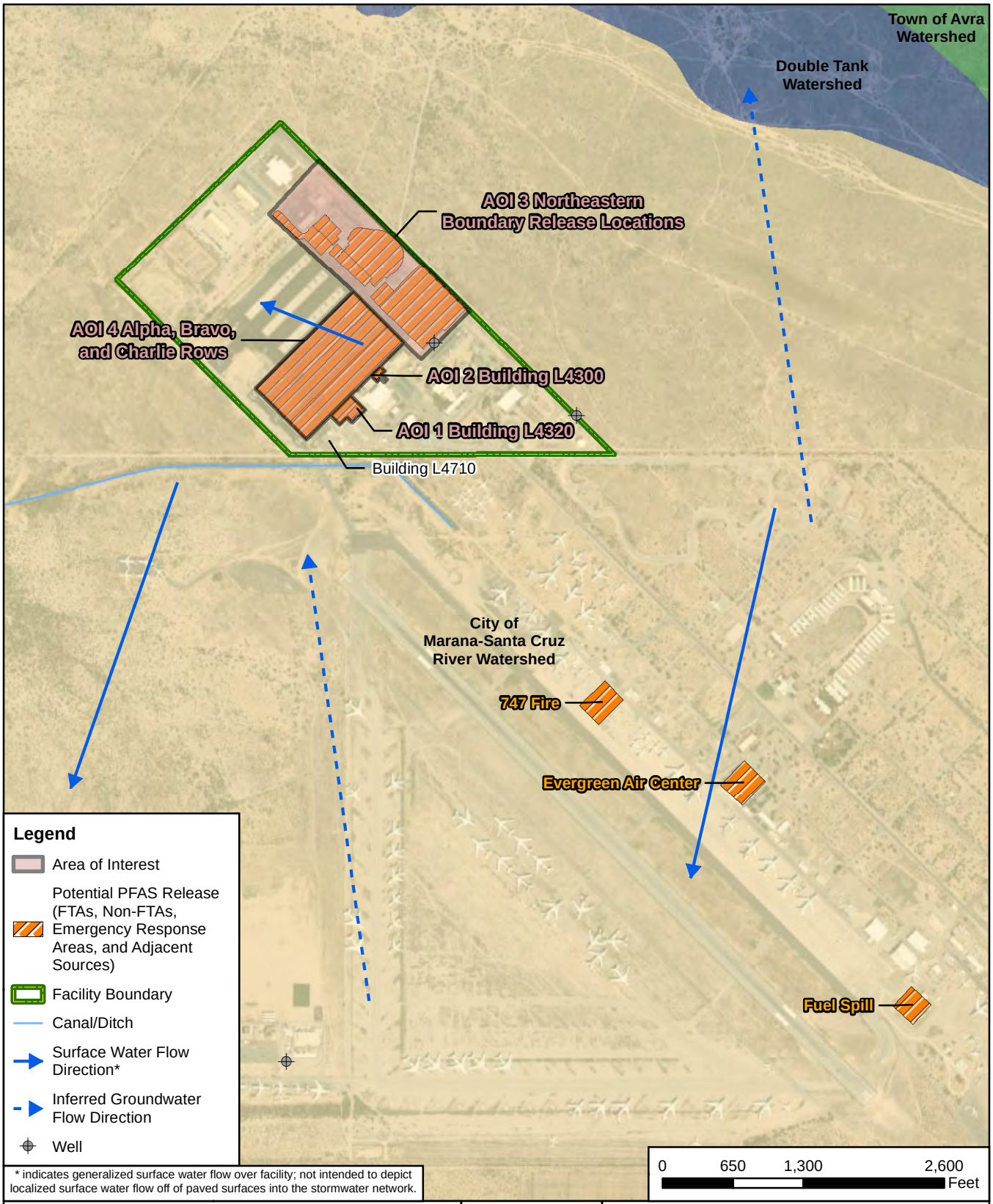
AOI 4 is the area surrounding Alpha, Bravo, and Charlie Rows on the tarmac. Emergency response activities described in this area involved response to aviation fuel-related spills. Historically, AFFF was used on each of these three rows to control fire or fire-potential at fuel spills.

AOI 4 is located just northwest of AOIs 1 and 2, and southwest of AOI 3; AOI 4 is surrounded by other paved areas, unpaved areas, and landscaping gravel. Like AOIs 2 and 3, this area is not vegetated, indicating possible fugitive dust emissions are not mitigated by natural surface cover. Therefore, the pathway for potential exposure to PFAS contamination to SBAH staff and construction workers via inhalation of dust particles or exposure to surface soil during construction or maintenance is considered potentially complete. Additionally, these dust particles can travel off-facility, therefore, the pathway for potential exposure to PFAS contamination to residents is considered potentially complete.

It is possible that AFFF releases across this area may have resulted in PFAS transport to the SBAH stormwater network. Precipitation on paved surfaces will generally flow overland or be collected by the facility's stormwater network infrastructure, where it is ultimately discharged to the stormwater retention basin in the northwestern corner of SBAH. Therefore, facility staff and construction workers may be exposed to surface water, and therefore also potentially sediment, at the facility during periods when standing or flowing water exists at the facility; however, the frequency of significant rain events is low in Arizona. Exposure via surface water and sediment are limited to times when sufficient rain is falling and, therefore, reduces the exposure potential of site and construction workers to near negligible.

PFAS may have also been transported to subsurface soil and groundwater via dry wells in the SBAH stormwater network. Because drinking supply wells exist at the facility, the pathway for PFAS in groundwater to facility staff, construction workers, and trespassers is potentially complete. Additionally, private wells exist off-facility and downgradient to the north. Therefore, the pathway for PFAS exposure in drinking water to off-facility receptors is potentially complete.

Ground-disturbing activities to subsurface soil at AOI 4 could result in construction worker exposure to potential PFAS contamination via inhalation of dust particles or ingestion of subsurface soil in the unpaved areas within and surrounding the Alpha, Bravo, and Charlie Rows. Therefore, the exposure pathways for these receptors are potentially complete. The preliminary CSM diagram for AOI 4 is shown on **Figure 6-2.**



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Silver Bell Army Heliport, AZ			
REVISED	9/15/2020	GIS BY	MS	9/15/2020
SCALE	1:15,600	CHK BY	BL	9/15/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	9/15/2020

Areas of Interest

AECOM
12420 Milestone Center Drive
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Figure 6-1

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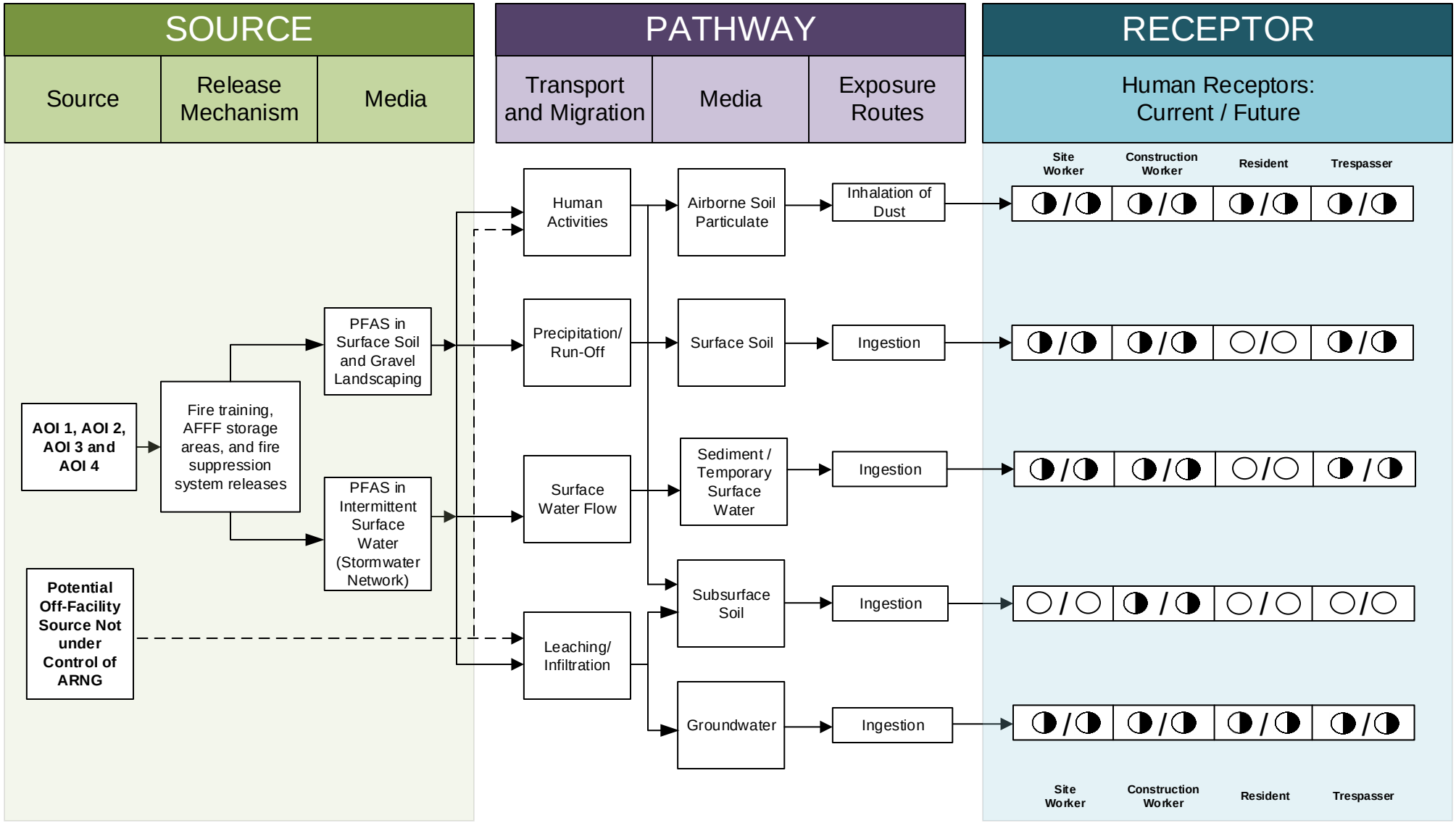

LEGEND

- Flow-Chart Continues
- Partial / Possible Flow
- Incomplete Pathway
- Potentially Complete Pathway
- Complete Pathway

Figure 6-2
Preliminary Conceptual Site Model
AOI 1, AOI 2, AOI 3 and AOI 4

7. Conclusions

This report presents a summary of available information gathered during the PA on the use and storage of AFFF and other PFAS-related activities at SBAH. The PA findings are based on personnel interviews, environmental investigations and reports, historical documents, and the VSI (**Appendix A, Appendix B,** and **Appendix C**).

7.1 Findings

Four AOIs related to PFAS releases were identified at SBAH during the PA. The AOIs are shown on **Figure 7-1** and described below in **Table 7-1**.

Table 7-1: AOIs at SBAH

Area of Interest	Name	Used by	Assumed Release Dates^
AOI 1	Building L4320	AZARNG	2009 - 2018
AOI 2	Building L4300	AZARNG	1985 – 1994; 2006 - 2009
AOI 3	Northeastern Boundary Release Locations	AZARNG	2004, 2007, 2011, 2017, 2018
AOI 4	Alpha, Bravo, Charlie Rows	AZARNG	2003/2004

^ In many instances, actual release dates were not available. The release dates have been assumed based on occupancy and use of the building.

The AOIs are locations where AFFF releases to the environment at SBAH occurred via fire training, fire suppression system releases, maintenance activities, equipment storage, and responses to fuel spills. Based on known AFFF releases at the AOIs listed above, there is potential for exposure to PFAS contamination in media at or near the facility. The preliminary CSM for SBAH is shown in **Figure 6-2**, which presents the potential receptors and media impacted.

7.2 Uncertainties

A number of information sources were reviewed and evaluated during this PA to determine the potential for PFAS-containing materials to have been present, used, or released at the facility. Historically, documentation of AFFF usage was not required because PFAS were considered benign. Therefore, records were not typically kept by the facility or available during the PA on the use of AFFF in training, firefighting, other non-traditional activities, or on its disposition.

The conclusions of this PA are based on all available information, including: previous environmental reports, EDRs™, observations made during the VSI, and interviews. Interviews of personnel with direct knowledge of a facility generally provided the most useful insights regarding a facility's historical and current PFAS-containing materials. Sometimes the provided information was vague. Gathered information has a degree of uncertainty due to the absence of written documentation, the limited number of personnel with direct knowledge due to staffing changes, the time passed since PFAS was first used (1969 to present), and a reliance on personal recollection. Inaccuracies may arise in potential PFAS release locations, dates of release, volume of releases, and the concentration of AFFF used. There is also a possibility the PA has missed a source of PFAS, as the science of how PFAS may enter the environment continually evolves.

In order to minimize the level of uncertainty, readily available data regarding the use and storage of PFAS were reviewed, current and former SBAH personnel were interviewed, and the majority of potential source areas were visually inspected.

Table 7-2 summarizes the uncertainties associated with the PA:

Table 7-2: Uncertainties within the PA

Location	Source of Uncertainty
AOI 1 Building L4320	According to SBAH personnel, AFFF leaked from a fire truck within the fire house and drained through the bay floor drain. The date of this leak and volume of AFFF released is unknown
AOI 2 Building L4300	The exact timeframe of fire training at this AOI is unknown.
AOI 3 Northeastern Boundary Release Locations	The exact frequency of training and number of Tri-Max™ units discharged per training event at the Singapore Hangar (L4650) are unknown. The frequency of training and volume of AFFF discharged per training event at the Wash Rack (L4603) are unknown, and it is unclear whether any discharged AFFF infiltrated cracks in the ground surface in its vicinity. The exact timeframe and location of fire training at AASF #2 (L4600) is unknown. The exact timeframe of the former fire station's (L4601) use as a fire station is unknown, and it is unclear whether similar fire training operations occurred at this fire station that have occurred at other SBAH fire stations. The volume of AFFF released during the 2011, 2017, and 2018 releases at the WAATS Hangar (L4605) is unknown. It is also unclear how exactly released AFFF was disposed of in each event.
AOI 4 Alpha, Bravo, and Charlie Row Fuel Spills	The specific locations and dates of these fuel spills are unclear, and the volume of AFFF used in response to both events is unknown.
Pinal Airpark (adjacent source)	It is unknown if AFFF is stored in fire suppression systems at the airfield. The date and cause of the Boeing 747 fire is unknown as is the volume of AFFF released in response to the fire. Additionally, the date, exact location, and volume of AFFF released in response to the large spill are unknown.
Evergreen Air Center (adjacent source)	It is unknown whether AFFF is used at Evergreen Air Center, or if emergency responses using AFFF have occurred at the location.
I-10 Accident Response (adjacent source)	SBAH fire department has responded to accidents on I-10 over the years. It is unknown where the exact locations of accident

Location	Source of Uncertainty
	response occurred. The quantity and frequency of AFFF released are unknown.

7.3 Potential Future Actions

Interviews with SBAH staff whose first-hand knowledge of the facility span 1994 to present indicate fire training, fire suppression systems, AFFF management, and responses to aviation emergencies have released PFAS to the environment.

Based on the preliminary CSM developed for SBAH, receptors have been potentially exposed to PFAS in airborne particulates, surface and subsurface soil, sediment, and groundwater. **Table 7-3** summarizes the rationale used to determine if AOIs at SBAH should be considered for further investigation using the CERCLA process.

Table 7-3: PA Findings Summary

Area of Interest	AOI Location	Rationale	Potential Future Action
AOI 1 Building L4320	32°31’14.6” N; 111°19’59.6” W	Unknown quantity of AFFF used during fire training activities equipment storage, and maintenance activities.	Proceed to an SI, focus on soil and groundwater
AOI 2 Building L4300	32°31’17.8” N; 111°19’56.3” W	Unknown quantity of AFFF used during fire training activities.	Proceed to an SI, focus on soil and groundwater
AOI 3 Northeastern Boundary Release Locations	32°31’25.3” N; 111°19’55.3” W	Unknown quantity of AFFF used during fire training activities and released from fire suppression systems.	Proceed to an SI, focus on soil and groundwater
AOI 4 Alpha, Bravo, and Charlie Rows	32°31’21.5” N; 111°19’54.9” W	Unknown quantity of AFFF used during emergency response activities.	Proceed to an SI, focus on soil and groundwater

ARNG will evaluate the need for an SI at SBAH based on the potential receptors, the potential migration of PFAS contamination off the facility, and the availability of resources.

CLIENT	ARNG			
PROJECT	Preliminary Assessment for PFAS at Silver Bell Army Heliport, AZ			
REVISED	9/15/2020	GIS BY	MS	9/15/2020
SCALE	1:7,200	CHK BY	BL	9/15/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	9/15/2020

N

TITLE

Summary of Findings

AECOM

12420 Milestone Center Drive
Germantown, MD 20876

Figure 7-1

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Appendix A
Data Resources

Data resources will be provided separately on CD. Data resources for Silver Bell Army Heliport include:

Silver Bell Army Heliport AFFF Release Information

- 2017 SBAH WAATS Hangar April Fire System Release Photos
- 2018 SBAH WAATS Hangar May Fire System Release Summary
- 2018 SBAH WAATS Hangar May Fire System Release Photos
- 2018 SBAH WAATS Hangar July Fire System Release Photos

Silver Bell Army Heliport Construction Planning Documents

- 2008 ADEMA Draft Cultural Resources Technical Report, Silver Bell Flood Wall
- 2009 ADEMA Pre-Construction Site Assessment Vacant 40 Acre Property Within APN 410-14-00309 Marana, Arizona
- 2014 SBAH Utility Site Plan Drawing
- 2015 ADEMA Pre-Construction Assessment for the Silverbell Army Heliport Nitrate Filtration System

Silver Bell Army Heliport Environmental Investigations and Report Information

- 1994 SBAH Dry Well Registration No. 07-008563-09
- 2006 Phase I Environmental Site Assessment for 170-Acre Marana WWTP Land Acquisition at SBAH, Marana, Arizona
- 2010 ADEMA Revisions to Hydrogeologic Investigation Report for Silverbell Wastewater Treatment Plant and Effluent Disposal System
- 2013 Environmental Condition of Property Report for DLA Permitted Assets at SBAH

Silver Bell Army Heliport Environmental Data Resources, Inc.™ Reports

- 2018 Silver Bell Army Heliport EDR™ Reports

Appendix B
Preliminary Assessment Documentation

Appendix B.1
Interview Records

PA Interview Questionnaire – Fire Station

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 11/9/18

Interviewee [redacted] (Assistant Chief) (Deputy Chief)
Title:
Phone Number [redacted]
Email: [redacted]

Can your name/role be used in the PA Report? Y or N
Can you recommend anyone we can interview?
Y or N [redacted] (Fire Chief at Ponderosa)

1. Roles or activities with the Facility/years working at the Facility.

[redacted] Since 2007 (Chief at Evergreen)
Since 2008 [redacted] (former Chief)

2. What can you tell us about the history of AFFF at the Facility? Was it used for any of the following activities, circle all that apply and indicate years of active use, if known? Identify these locations on a facility map.

Maintenance (e.g., ramp washing) No
Fire Training Areas yes
Firefighting (Active Fire) None onsite. Only offsite.
Crash None during their time.
Fire Suppression Systems (Hangers/Dining Facilities) Watts, HSF #2, Peace Vangard
Fire Protection at Fueling Stations Just POLs & fuel farm w/ trimex
Non-Technical/Recreational/ Pest Management No

3. Are any current buildings constructed with AFFF dispensing systems or fire suppression systems? What are the AFFF/suppression system test requirements? What is the frequency of testing at the AFFF/suppression systems?

Every year. Contracted out. Only pull sample w/ occassional flooding.

4. Are fire suppression systems currently charged with AFFF or have they been retrofitted for use of high expansion foam?

AFFF

5. How is AFFF procured? Do you have an inventory/procurement system that tracks use?

- ordered. Through tech supply (Sgt [redacted] ⇒ Federal
- Ordered as need. Check w/ Sgt

PA Interview Questionnaire – Fire Station

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 11/9/18

6. What type of AFFF has been/is being used (3%, 6%, Mil Spec Mil-F-24385, High Expansion)? Manufacturer (3M, Dupont, Ansul, National Foam, Angus, Chemguard, Buckeye, Fire Service Plus)?

3%. & 6%.

Ansul

7. Is AFFF formulated on base? If so, where is the solution mixed, contained, transferred, etc.?

Next to station for transferring & mixing.

8. Where is the AFFF stored? How is it stored (tanks, 55-gallon drums, 5-gallon buckets)? What size are the storage tanks? Is the AFFF stored as a mixed solution (3% or 6%) or concentrated material?

Fire Station

9. How is the AFFF transferred to emergency response vehicles, suppression systems, flightline extinguishers? Is/was there a specified area on the facility where vehicles are filled with AFFF and does this area have secondary containment in case of spills? How and where are vehicles storing AFFF cleaned/decontaminated?

- trucks electronic pump
- trimex w/ pail

Fire house.

10. Provide a list of vehicles that carried AFFF, now and in the past, and where are/were they located?

Engine 361, 362, 364, 2100, 194, two old Macy's, 2 ARF trucks (newly leased, 3000 gal / 1500 gal)
↳ 200 foam ↳ 120 foam

11. Any vehicles have a history of leaking AFFF? Do you/did you test the vehicles spray patterns to make sure equipment is working properly? How often are/were these spray tests performed and can you provide the locations of these tests, now and in the past?

trimex semi annual
trucks not tested w/ foam

PA Interview Questionnaire – Fire Station

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 11/9/18

12. How many FTAs are/were on this facility and where are they? Locate on a map. How many FTAs are active and inactive? For inactive FTAs, when was the last time that fire training using AFFF was conducted at them?

- By fire station.
- used to do trimex by ops. in front of each hangar. (over 1 yr ago) (one done last month in front of PV)
- Car fires in pit, but no foam.

13. What types of fuels/flammables were used at the FTAs?

- None

- No fire fighter training. Done at DM or Fort Huachuca.

14. What was the frequency of AFFF use at each location? When a release of AFFF occurs during a fire training exercise, now and in the past, how is/was the AFFF cleaned and disposed of? Were retention ponds built to store discharged AFFF? Was the AFFF trickled to the sanitary sewer or left in the pond to infiltrate?

yes

No. Area by fire station contained. Low lying.

15. Are there mutual aid/use agreements between county, city, local fire department? Please list, even if informal. If formalized, may we have a copy of the agreement? Can you recall specific times when city, county, state personnel came on-post for training? If so, please state which state/county agency, military entity? Do you have any records, including photographs to share with us?

yes, no foam.

16. Did individual units come on-post with their own safety personnel, did they also bring their own AFFF? Was training with AFFF part of these exercises? How were emergencies handled under these circumstances?

N/A

PA Interview Questionnaire – Fire Station

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 4/9/18

17. Did military routinely or occasionally fire train off-post? List units that you can recall used/trained at various areas.

18. Are there specific emergency response incident reports (i.e., aircraft or vehicle crash sites and fires)? If so, may we please copy these reports? Who (entity) was the responder?

- Evergreen only fuel spill. Chief [redacted] probably has info.
- probably have I-10 records.

19. Do you have records of fuel spill logs? Was it common practice to wash away fuel spills with AFFF? Is/was AFFF used as a precaution in response to fuel releases or emergency runway landings to prevent fires?

Evergreen.

20. Was AFFF used for forest fires or fire management on-post/off-post? If so, please describe what happened and who was involved?

NO. only water

21. Can you provide any other locations where AFFF has been stored, released, or used (i.e. hangars, buildings, fire stations, firefighting equipment testing and maintenance areas, emergency response sites, storm water/surface water, waste water treatment plants, and AFFF ponds)?

PA Interview Questionnaire – Fire Station

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 11/9/18

22. Are you aware of any other creative uses of AFFF? If so, how was AFFF used? What entities were involved? No
23. How is off-spec AFFF disposed (used for training, turned in, or given to a local Fire Station)? If applicable, do you know the name of the vendor that removes off-spec AFFF? Do you have copies of the manifest or B/L?
24. Do you recommend anyone else we can interview? If so, do you have contact information for them?

PA Interview Questionnaire – Fire Station

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 11/7/18

Interviewee: Sgm Chief [redacted] Title: Former Fire Chief at Marana. Phone Number: [redacted] Email: [redacted]	Can your name/role be used in the PA Report? (Y) or N Can you recommend anyone we can interview? (Y) or N [redacted]

1. Roles or activities with the Facility/years working at the Facility.

FF ~~Chief~~ Since 2000
Chief in 2011

2. What can you tell us about the history of AFFF at the Facility? Was it used for any of the following activities, circle all that apply and indicate years of active use, if known? Identify these locations on a facility map.

Maintenance (e.g., ramp washing)
(Fire Training Areas)
(Firefighting (Active Fire)) Large fuel spill (Bravo or Alpha Row). Dug out asphalt.
↳ talk w/ Carl [redacted]
Crash
(Fire Suppression Systems (Hangers/Dining Facilities)) has system.
Foam use unknown.
Maybe class k. watts Dining.
Fire Protection at Fueling Stations
Non-Technical/Recreational/ Pest Management

3. Are any current buildings constructed with AFFF dispensing systems or fire suppression systems? What are the AFFF/suppression system test requirements? What is the frequency of testing at the AFFF/suppression systems?

Hangers
- Supposed to be tested yearly.
- Every 5 yrs. a full scale test.
- Done when new hangar built.

4. Are fire suppression systems currently charged with (AFFF) or have they been retrofitted for use of high expansion foam?

5. How is AFFF procured? Do you have an inventory/procurement system that tracks use?

↳ State procurement.
Sometimes through mil sys., watts, peace vanguard.
↳ Doesn't know where.
↳ Training documented.

- Ordered new foam through procure Az. After told not to use AFFF.
- Doesn't know how they got rid of old AFFF.
- Trimex's at Picacho. No training. No bulk AFFF stored there.
- Trimex at SB still in place. Change out Afff every 2 yrs.

PA Interview Questionnaire – Fire Station

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 11/7/18

6. What type of AFFF has been/is being used (3%, 6%, Mil Spec Mil-F-24385, High Expansion)? Manufacturer (3M, Dupont, Ansul, National Foam, Angus, Chemguard, Buckeye, Fire Service Plus)?

7. Is AFFF formulated on base? If so, where is the solution mixed, contained, transferred, etc.?
yes, filled trimex

8. Where is the AFFF stored? How is it stored (tanks, 55-gallon drums, 5-gallon buckets)? What size are the storage tanks? Is the AFFF stored as a mixed solution (3% or 6%) or concentrated material?
- outside fire bldg
- pallets
- 55 gal

9. How is the AFFF transferred to emergency response vehicles, suppression systems, flightline extinguishers? Is/was there a specified area on the facility where vehicles are filled with AFFF and does this area have secondary containment in case of spills? How and where are vehicles storing AFFF cleaned/decontaminated?
- Hose w/ a pump. (trucks)
- Sys has own pumps. Contractor does.
- trimex. 5 gal pails. taken from 55 gal drums

10. Provide a list of vehicles that carried AFFF, now and in the past, and where are/were they located?
- TFTs
- Engine 364, 363
- P19s

11. Any vehicles have a history of leaking AFFF? Do you/did you test the vehicles spray patterns to make sure equipment is working properly? How often are/were these spray tests performed and can you provide the locations of these tests, now and in the past?
- NO
- N/A

PA Interview Questionnaire – Fire Station

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 11/7/08

Fire training areas

12. How many FTAs are/were on this facility and where are they? Locate on a map. How many FTAs are active and inactive? For inactive FTAs, when was the last time that fire training using AFFF was conducted at them?

- By fire station
- Alot done at DM

13. What types of fuels/flammables were used at the FTAs?

No

14. What was the frequency of AFFF use at each location? When a release of AFFF occurs during a fire training exercise, now and in the past, how is/was the AFFF cleaned and disposed of? Were retention ponds built to store discharged AFFF? Was the AFFF trickled to the sanitary sewer or left in the pond to infiltrate?

-Disipate

15. Are there mutual aid/use agreements between county, city, local fire department? Please list, even if informal. If formalized, may we have a copy of the agreement? Can you recall specific times when city, county, state personnel came on-post for training? If so, please state which state/county agency, military entity? Do you have any records, including photographs to share with us?

-Aircraft excercises. No foam.

16. Did individual units come on-post with their own safety personnel, did they also bring their own AFFF? Was training with AFFF part of these exercises? How were emergencies handled under these circumstances?

N/A

PA Interview Questionnaire – Fire Station

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 4/7/18

17. Did military routinely or occasionally fire train off-post? List units that you can recall used/trained at various areas.

- DM
- Picacho
- Ft. Huachuca

18. Are there specific emergency response incident reports (i.e., aircraft or vehicle crash sites and fires)? If so, may we please copy these reports? Who (entity) was the responder?

- couple of aircraft crashes (ask [redacted])
  ↳ in area

19. Do you have records of fuel spill logs? Was it common practice to wash away fuel spills with AFFF? Is/was AFFF used as a precaution in response to fuel releases or emergency runway landings to prevent fires?

No

20. Was AFFF used for forest fires or fire management on-post/off-post? If so, please describe what happened and who was involved?

No

21. Can you provide any other locations where AFFF has been stored, released, or used (i.e. hangars, buildings, fire stations, firefighting equipment testing and maintenance areas, emergency response sites, storm water/surface water, waste water treatment plants, and AFFF ponds)?

See notes

PA Interview Questionnaire – Fire Station

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 11/7/18

22. Are you aware of any other creative uses of AFFF? If so, how was AFFF used? What entities were involved? See Notes
23. How is off-spec AFFF disposed (used for training, turned in, or given to a local Fire Station)? If applicable, do you know the name of the vendor that removes off-spec AFFF? Do you have copies of the manifest or B/L? See Notes
24. Do you recommend anyone else we can interview? If so, do you have contact information for them? See notes

- used foam during training. once a month. used trimex.
- used by fire station on dirt patch. used 1 or 2 units.
- Did pump tests on trucks, but never used foam.
- Had a big fire truck. One shot, one kill. Had to service after one use. Don't test often. Had foam. Last time used was on a house fire off base.

PA Interview Questionnaire - Other

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 11/9/18

Interviewee: [redacted] **Title:** Site Safety officer (CW2) **Phone Number:** [redacted] **Email:** [redacted]	Can your name/role be used in the PA Report? (Y) or N Can you recommend anyone we can interview? (Y) or N [redacted]

Roles or activities with the Facility/Years working at the Facility:

Since 2002

PFAS Use: Identify accidental/intentional release locations, time frame of release, frequency of releases, storage container size (maintenance, fire training, firefighting, buildings with suppression systems (as builts), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?

	Known Uses
	Use
	Procurement
	Disposition
See Notes	Storage (Mixed)
	Storage (Solution)
	Inventory, Off-Spec
	Containment
	SOP on Filling
	Leaking Vehicles
	Nozzle and Suppression System Testing
	Dining Facilities
	Vehicle Washing
	Ramp Washing
	Fuel Spill Washing and Fueling Stations
	Chrome Plating or Waterproofing

PA Interview Questionnaire - Other

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 11/9/18

- Annual trimex training on asphalt south of ASIF2.
- Used 1 or 2 trimax units (Stopped several yrs. ago)
- Doesn't remember when surpression system triggered (testing). State should have records. Employees deconned. Was in First bay of ASIF Hangar.
- Each bay triggers independently.
- Leaked out back from paint room & machine room. (photos provided).

PA Interview Questionnaire - Other

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 11/9/18

Interviewee: [redacted] **Title:** CW5 Safety Officer for WAATS **Phone Number:** [redacted] **Email:** [redacted]	Can your name/role be used in the PA Report? (Y) or N Can you recommend anyone we can interview? Y or (N) _____

Roles or activities with the Facility/Years working at the Facility:

- Since 1994

PFAS Use: Identify accidental/intentional release locations, time frame of release, frequency of releases, storage container size (maintenance, fire training, firefighting, buildings with suppression systems (as builts), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?

	Known Uses
	Use
	Procurement
	Disposition
See notes	Storage (Mixed)
	Storage (Solution)
	Inventory, Off-Spec
	Containment
	SOP on Filling
	Leaking Vehicles
	Nozzle and Suppression System Testing
	Dining Facilities
	Vehicle Washing
	Ramp Washing
	Fuel Spill Washing and Fueling Stations
	Chrome Plating or Waterproofing

PA Interview Questionnaire - Other

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 11/9/18

- Discharge in Riser Room of system in WAATS (July 25, 2018)
- Full system
- Does not remember date.
- No one came to clean up. Fire fighters shut off.
- Let dry on floor.
- Did do trimax fire training. Done last year.
  - 2 trimax units. Done by fire.
  - tried to put out a fire.
  - In front of Fire House (New).
- Remembers an emergency use, but doesn't remember specifics.
- A sheet metal system discharge in May 2018.

PA Interview Questionnaire - Other

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 11/9/18

Interviewee: Group interview **Title:** **Phone Number:** **Email:**	Can your name/role be used in the PA Report? (Y) or N Can you recommend anyone we can interview? Y or N

Roles or activities with the Facility/Years working at the Facility:

[redacted] - Logistics Mgmt officer (CW5) [redacted]

[redacted], Physical Plant Supervisor 1, [redacted]

[redacted], Bldg Main. Tech, [redacted]

[redacted] - Aviation Safety officer for Peace Vangard (CW3), [redacted]

PFAS Use: Identify accidental/intentional release locations, time frame of release, frequency of releases, storage container size (maintenance, fire training, firefighting, buildings with suppression systems (as builts), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?

See Notes

Known Uses
Use
Procurement
Disposition
Storage (Mixed)
Storage (Solution)
Inventory, Off-Spec
Containment
SOP on Filling
Leaking Vehicles
Nozzle and Suppression System Testing
Dining Facilities
Vehicle Washing
Ramp Washing
Fuel Spill Washing and Fueling Stations
Chrome Plating or Waterproofing

PA Interview Questionnaire - Other

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 11/9/18

- AFFF had dedicated training area.
- Have had 2 discharge events in the past year & a half.
- Leaks at AFFF room. Discharge went through door & onto ground.
- Have 58 trimax units onsite. Between each aircraft. Up to just under 100.
  - Contractor came onsite & disposed of some. Some remain onsite for parts.
  - Drilled holes in each onsite. Solution dumped onsite. Not to fire house.
  - Changed solution every 6 months. Trained w/ them. Emptied close to 100 per year (not counting training excercises)
    - Have training records.
    - Has been going on for >12 yrs.
- Trimex came onsite in 2002/2003 (according to [redacted] and [redacted]
  - Had big CO_2 containers prior to trimax. None on ramp prior to trimax units.
- Trimax serviced next to station. Area consistently used.
- Filled outside of bldg.
- Bulk Afff stored onsite in 3 to 5 55 gal drums at any one time. Stored at firehouse.
- one TFT engine had a leak that would go into floor drain & into OWS.
  - OWS go to on Base WWTP.
    - WWTP just for guard.
    - Sludge is trucked out. Doesn't know where.
      - Have manifests.
- Fire Trucks: TFT, ART — 200 gal foam
  (2-60 gal foam cells
- Trucks for Picacho serviced here. Trimex serviced there
  (stage field
- 3 hangars w/ surpression systems.
  - triggered at first building

PA Interview Questionnaire - Other

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 11/9/18

- Early 2000s had a discharge at ASIFF. Pipes were rusted.
  - 2004/2005
  - Bldg 4600
- Another in 2007.
- This summer a seal failed in the back of the hangar & ran out (2018)
- Filled Sheet metal Shop (2018)
- The Watts Hangar (4605) Afff foam Room filled in 2016 & 2018 (pics sent)
  - April
  - August
- Release in Back of Watts Hangar (4605) in 2011.
- None at Peace Vanguard.
- Contractor cleaned up after releases. Pipes not flushed.
- Off Base uses.
  - ↳ Fuel tanker & 18 wheeler hit on I-10. Used 300-400 gals of foam.
  - ↳ Next door at air yard 747 caught fire.
- outside units come on & train, but never use foam.
- use foam at DM & Ft. Huachuca.
- No non-standard uses. Try to limit uses.
- Vehicle maintenance done here at Fms shop. Lately some done in Phx., but not foam system. Have never had foam tanks fixed.
- Lines flushed after emergencies onsite.
- Large fuel spill at maraha Air space. Used foam. Used on Ramp near hangar. ([redacted] would have more info). They used foam. Air Park next door.
- Burn fire at Picacho (Chief [redacted]).

PA Interview Questionnaire - Other

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 11/9/18

Interviewee: [redacted]	Can your name/role be used in the PA Report? (Y) or N
Title: Major	Can you recommend anyone we can interview?
Phone Number: [redacted]	(Y) or N Watts = CW5 [redacted]
Email: [redacted]	

Roles or activities with the Facility/Years working at the Facility:

Installation facility Mgr.

PFAS Use: Identify accidental/intentional release locations, time frame of release, frequency of releases, storage container size (maintenance, fire training, firefighting, buildings with suppression systems (as builts), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?

	Known Uses
	Use
	Procurement
	Disposition
	Storage (Mixed)
	Storage (Solution)
	Inventory, Off-Spec
None	Containment
	SOP on Filling
	Leaking Vehicles
	Nozzle and Suppression System Testing
Yes, no AFFF sys.	Dining Facilities
Yes, No AFFF	Vehicle Washing
Yes, NO AFFF	Ramp Washing
Charlie Road Spill in 2003/2004. Used AFFF. Contained on ramp	Fuel Spill Washing and Fueling Stations
None.	Chrome Plating or Waterproofing

PA Interview Questionnaire - Other

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 11/9/18

Interviewee: [redacted] **Title:** ALSE Supervisor **Phone Number:** [redacted] **Email:** [redacted]	Can your name/role be used in the PA Report? (Y) or N Can you recommend anyone we can interview? (Y) or N Cal [redacted], OR [redacted] (at Papago)

Roles or activities with the Facility/Years working at the Facility:

- Since 2000/2001

PFAS Use: Identify accidental/intentional release locations, time frame of release, frequency of releases, storage container size (maintenance, fire training, firefighting, buildings with suppression systems (as builts), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?

	Known Uses
	Use
	Procurement
	Disposition
See Notes	Storage (Mixed)
	Storage (Solution)
	Inventory, Off-Spec
	Containment
	SOP on Filling
	Leaking Vehicles
	Nozzle and Suppression System Testing
	Dining Facilities
	Vehicle Washing
	Ramp Washing
	Fuel Spill Washing and Fueling Stations
	Chrome Plating or Waterproofing

PA Interview Questionnaire - Other

Facility: Silverbell
Interviewer: [redacted]
Date/Time: 11/9/18

- Involved in 2004 ASIF incident.
- Not super foamy. It was black.
- He got covered in it. Tried to cap eq. lines on helicopter while release was going on.
- Took him to emergency.
- Doesn't know what happened to the aircraft.
- Trained w/ trimex.
  - Was done on apron & on pads & by the wash rack.
  - Done annually.

Appendix B.2
Visual Site Inspection Checklists

Facility ST
Visual Survey Inspection Log

Recorded by: [redacted]
ARNG Contact:
Date: 11/9/18

Site Name / Area Name / Unique ID: ASIF BAY #1
Site / Area Acreage: unknown
Historic Site Use (Brief Description): Aircraft Bay
Current Site Use (Brief Description): Aircraft Bay

1. Was AFFF used at the site/area? (Y) / N
   3a. If yes, document how AFFF was used and usage time (e *g., fire fighting training 2001 to 2014)* Surpression System
2. Has usage been documented? (Y) N
   2a. If yes, keep a record (place electronic files on a disk) No

Significant Topographical Features:

1. Has the infrastructure changed at the site/area? Y / (N)
   1a. If so, please describe change: (*ex. Structures structures longer exist.)*
2. Is the site/area vegetated? Y / (N)
   2a. If not vegetated, briefly describe the site/area composition:
3. Does the site or area exhibit evidence of erosion? Y / (N)
   3a. If yes, describe the location and extent of the erosion :
4. Does the site/area exhibit any areas of ponding or standing water? Y (N)
   4a. If yes, describe the location and extent of the ponding :

Migration Potential:

1. Does site/area drainage flow off installation? Y (N)
   1a. If so, please note observation and location:
2. Is there standing water or drainage issues within the site/area? Y / (N)
   2a. If so, please note observation and location:
3. Is there channelized flow within the site/area? Y / (N)
   3a. If so, please note observation and location:
4. Have man-made drainage channels been constructed within the site/area? (Y) N
   4a. If so, please note the location of the channel: Trench drain

Additional Notes

Trench drain on S. Side of bay. Discharge outlet unknown. Mopped up spill on Zamboni. Directed toward drain.

Facility ST
Visual Survey Inspection Log

Recorded by: [redacted]
ARNG Contact: [redacted]
Date: 4/9/18

Site Name / Area Name / Unique ID: Former Firestation Ramp
Site / Area Acreage: Unknown
Historic Site Use (Brief Description): Firestation

Current Site Use (Brief Description): Classrooms

1. Was AFFF used at the site/area? (Y) / N
   3a. If yes, document how AFFF was used and usage time (e.g., *fire fighting training 2001 to 2014*) training
2. Has usage been documented? Y / (N)
   2a. If yes, keep a record (place electronic files on a disk)

Significant Topographical Features:

1. Has the infrastructure changed at the site/area? (Y) / N
   1a. If so, please describe change: (*ex. Structures structures longer exist.*) Changed from Station to Classrooms
2. Is the site/area vegetated? Y / N
   2a. If not vegetated, briefly describe the site/area composition:
3. Does the site or area exhibit evidence of erosion? Y / (N)
   3a. If yes, describe the location and extent of the erosion:
4. Does the site/area exhibit any areas of ponding or standing water? Y / (N)
   4a. If yes, describe the location and extent of the ponding:

Migration Potential:

1. Does site/area drainage flow off installation? Y / (N)
   1a. If so, please note observation and location:
2. Is there standing water or drainage issues within the site/area? Y / (N)
   2a. If so, please note observation and location:
3. Is there channelized flow within the site/area? Y / (N)
   3a. If so, please note observation and location:
4. Have man-made drainage channels been constructed within the site/area? Y / (N)
   4a. If so, please note the location of the channel:

Additional Notes

[redacted] states that area used to foam up when wet. Lots of foam in area (residual)

Facility ST
Visual Survey Inspection Log

Recorded by: [redacted]
ARNG Contact:
Date: 11/9/18

Site Name / Area Name / Unique ID: FTA by firehouse
Site / Area Acreage: Unknown
Historic Site Use (Brief Description): Training area for AFFF

Current Site Use (Brief Description): Low lying area w/ Trimex storage adjacent & Foam storage

1. Was AFFF used at the site/area? (Y) / N
   3a. If yes, document how AFFF was used and usage time (e.g., *fire fighting training 2001 to 2014*) See notes
2. Has usage been documented? Y / N
   2a. If yes, keep a record (place electronic files on a disk)

Significant Topographical Features:

1. Has the infrastructure changed at the site/area? Y / (N)
   1a. If so, please describe change: (*ex. Structures structures longer exist.*)
2. Is the site/area vegetated? (Y) N
   2a. If not vegetated, briefly describe the site/area composition:
3. Does the site or area exhibit evidence of erosion? Y / (N)
   3a. If yes, describe the location and extent of the erosion :
4. Does the site/area exhibit any areas of ponding or standing water? Y / (N)
   4a. If yes, describe the location and extent of the ponding :

Migration Potential:

1. Does site/area drainage flow off installation? Y / N
   1a. If so, please note observation and location:
2. Is there standing water or drainage issues within the site/area? Y / N
   2a. If so, please note observation and location:
3. Is there channelized flow within the site/area? Y / (N)
   3a. If so, please note observation and location: NO Directed to culverts under gravel roadway, which drains into drywell (see storm drain?)
4. Have man-made drainage channels been constructed within the site/area? Y / (N)
   4a. If so, please note the location of the channel:

Additional Notes

Flightline angled toward small paved drainage channel that empties into low lying area. Trimex units located by aircraft on flightline.

3 Floor drains per bay (3 bays) in Fire house.

Facility ST
Visual Survey Inspection Log

Recorded by: [redacted]
ARNG Contact:
Date: 11/9/18

Site Name / Area Name / Unique ID: Wash rack (ASIF)
Site / Area Acreage: Unknown
Historic Site Use (Brief Description): Wash Rack

Current Site Use (Brief Description): Wash Rack

1. Was AFFF used at the site/area? (Y) N
   3a. If yes, document how AFFF was used and usage time (e.g., *fire fighting training 2001 to 2014*) May have done training in area.
2. Has usage been documented? Y (N)
   2a. If yes, keep a record (place electronic files on a disk)

Significant Topographical Features:

1. Has the infrastructure changed at the site/area? Y / (N)
   1a. If so, please describe change: (*ex. Structures structures longer exist.*)
2. Is the site/area vegetated? Y / (N)
   2a. If not vegetated, briefly describe the site/area composition:
3. Does the site or area exhibit evidence of erosion? Y / (N)
   3a. If yes, describe the location and extent of the erosion :
4. Does the site/area exhibit any areas of ponding or standing water? Y (N)
   4a. If yes, describe the location and extent of the ponding :

Migration Potential:

1. Does site/area drainage flow off installation? Y (N)
   1a. If so, please note observation and location:
2. Is there standing water or drainage issues within the site/area? Y / (N)
   2a. If so, please note observation and location:
3. Is there channelized flow within the site/area? Y / (N)
   3a. If so, please note observation and location:
4. Have man-made drainage channels been constructed within the site/area? Y / (N)
   4a. If so, please note the location of the channel:

Additional Notes
Drain in area.

Appendix B.3
Conceptual Site Model Information

Preliminary Assessment – Conceptual Site Model Information

Site Name: Silverbell

Why has this location been identified as a site? Known AFFF releases. Airfield.

Are there any other activities nearby that could also impact this location? Pinal Airpark to the east.

Training Events

Have any training events with AFFF occurred at this site? yes

If so, how often? Alot. See notes.

How much material was used? Is it documented? Quantities unknown. Reported to be a lot.

Identify Potential Pathways: Do we have enough information to fully understand over land surface water flow, groundwater flow, and geological formations on and around the facility? Any direct pathways to larger water bodies?

Surface Water:

Surface water flow direction? Northwest

Average rainfall? 11"

Any flooding during rainy season? Local flooding during monsoons.

Direct or indirect pathway to ditches? Drainage ditches throughout.

Direct or indirect pathway to larger bodies of water? Santa Cruz River ~2 miles to west

Does surface water pond any place on site? Retention ponds on SW corner of property

Any impoundment areas or retention ponds? yes

Any NPDES location points near the site? No

How does surface water drain on and around the flight line? Drains off of flight line.

Preliminary Assessment – Conceptual Site Model Information

Groundwater:

Groundwater flow direction? Northwest

Depth to groundwater?

Uses (agricultural, drinking water, irrigation)?

Any groundwater treatment systems?

Any groundwater monitoring well locations near the site?

Is groundwater used for drinking water?

Are there drinking water supply wells on installation?

Do they serve off-post populations?

Are there off-post drinking water wells downgradient

Waste Water Treatment Plant:

Has the installation ever had a WWTP, past or present? Yes, present

If so, do we understand the process and which water is/was treated at the plant? Yes.

Do we understand the fate of sludge waste? Yes. Transported offsite.

Is surface water from potential contaminated sites treated?

Equipment Rinse Water

1. Is firefighting equipment washed? Where does the rinse water go? Yes, outside d
drains in Fire house.

2. Are nozzles tested? How often are nozzles tested? Where are nozzles tested? Are nozzles cleaned after use? Where does the rinse water flow after cleaning nozzles?

See notes.

3. Other? See notes.

Preliminary Assessment – Conceptual Site Model Information

Identify Potential Receptors:

Site Worker Yes

Construction Worker Yes

Recreational User No

Residential No

Child No

Ecological Yes

Note what is located near by the site (e.g. daycare, schools, hospitals, churches, agricultural, livestock)?

Vacant land & Buildings. Pinal airpark adjacent.

Documentation

Ask for Engineering drawings (if applicable). None provided.

Has there been a reconstruction or changes to the drainage system? When did that occur? None reported.

Appendix C
Photographic Log

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Silver Bell Army Heliport	Red Rock, Arizona

Photograph No. 1

Description:

Dirt area north of former fire station ramp (L4300)

(view to ESE)

Photograph No. 2

Description:

Former fire station ramp (L4300)

(view to SE)

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Silver Bell Army Heliport	Red Rock, Arizona

Photograph No. 3

Description:

Former fire station ramp (L4300) and low lying area

(view to SW)

Photograph No. 4

Description:

AFFF and Tri-max storage area on driveway of current fire station (L4320)

(view is NE)

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Silver Bell Army Heliport	Red Rock, Arizona

Photograph No. 5

Description:

Drainage area next to AFFF storage area and west of current fire station (L4320)

(view to SW)

Photograph No. 6

Description:

Drainage ditch area west of current fire station (L4320)

(view to SW)

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Silver Bell Army Heliport	Red Rock, Arizona

Photograph No. 7

Description:

Drywell in drainage ditch west of current fire station (L4320)

Photograph No. 8

Description:

Tri-max storage area west of current fire station (L4320)

(view to SW)

APPENDIX C – Photographic Log

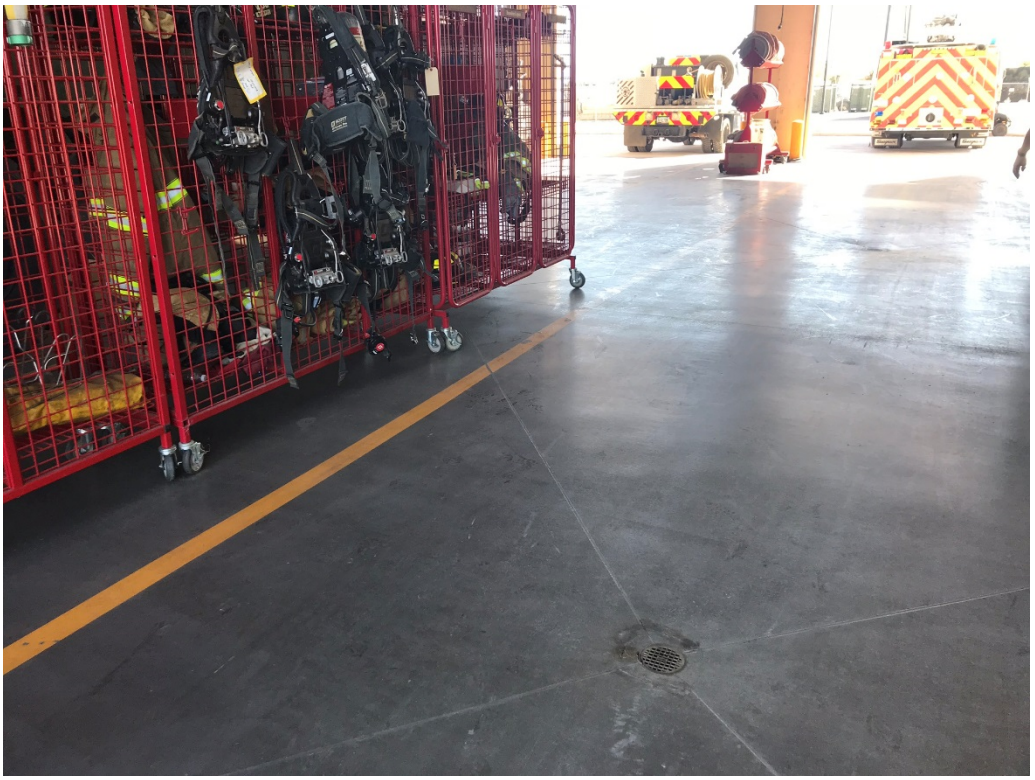
Army National Guard, Preliminary Assessment for PFAS	Silver Bell Army Heliport	Red Rock, Arizona

Photograph No. 9

Description:

Floor drain in current fire station bay (L4320)

(view to NW)



Photograph No. 10

Description:

Spill pad drain concrete pad with cracks

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Silver Bell Army Heliport	Red Rock, Arizona

Photograph No. 11

Description:

April 2017 release of AFFF from fire riser room at the back of the WAATS building (L4605)

(view to SE)

Photograph No. 12

Description:

April 2017 release of AFFF from fire riser room at the back of the WAATS building (L4605)

(view to NW)

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Silver Bell Army Heliport	Red Rock, Arizona

Photograph No. 13

Description:

April 2017 release of AFFF from fire riser room at the back of the WAATS building (L4605)

(view to W)

Photograph No. 14

Description:

April 2017 release of AFFF from fire riser room at the back of the WAATS building (L4605)

(view to W)

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Silver Bell Army Heliport	Red Rock, Arizona

Photograph No. 15

Description:

May 2018 release of AFFF from the "old paint booth" at the back of the WAATS building (L4605)

(view to NW)

Photograph No. 16

Description:

May 2018 release of AFFF from the "old paint booth" at the back of the WAATS building (L4605)

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Silver Bell Army Heliport	Red Rock, Arizona

Photograph No. 17

Description:

May 2018 release of AFFF from the "old paint booth" at the back of the WAATS building (L4605)

Photograph No. 18

Description:

July 2018 release of AFFF from fire riser room at the back of the WAATS building (L4605)

(view to N)

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Silver Bell Army Heliport	Red Rock, Arizona

Photograph No. 19

Description:

July 2018 release of AFFF from fire riser room at the back of the WAATS building (L4605)

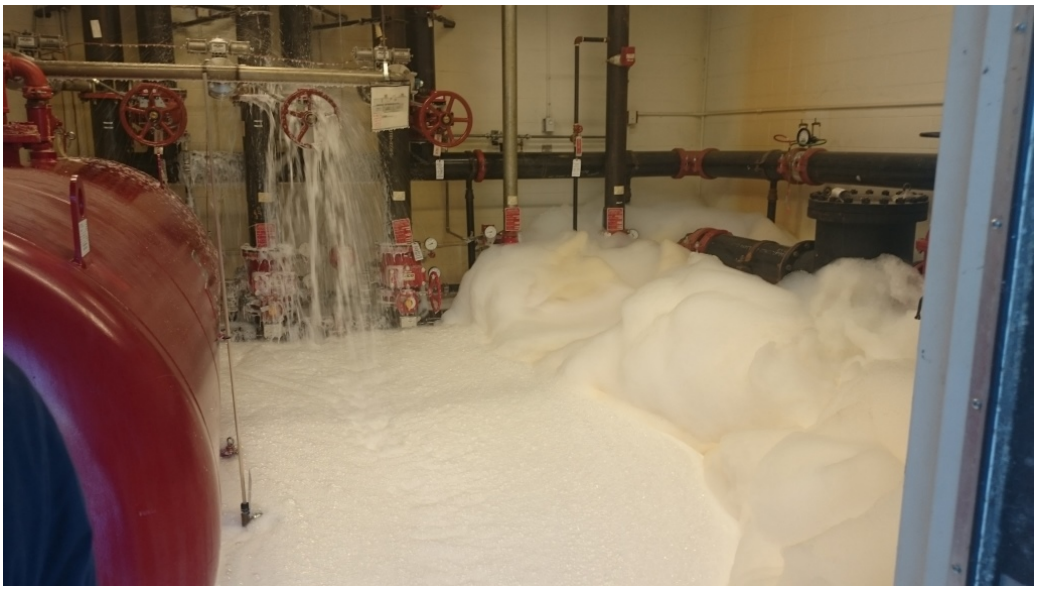
(view to N)

Photograph No. 20

Description:

July 2018 release of AFFF from fire riser room at the back of the WAATS building (L4605)

(view to N)



APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Silver Bell Army Heliport	Red Rock, Arizona

Photograph No. 21

Description

Gravel area behind WAATS (L4605) where the April 2017, May 2018, and July 2018 releases occurred

(view to N)