FINAL
Preliminary Assessment Report
Stockton AASF, California

Perfluorooctane-Sulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) Impacted Sites
ARNG Installations, Nationwide

January 2020

Prepared for:

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Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AECOM	AECOM Technical Services, Inc.
AFFF	aqueous film forming foam
amsl	above mean sea level
AOI	area of interest
ARNG	Army National Guard
bgs	below ground surface
CA	California
CAARNG	California Army National Guard
CAL FIRE	California Department of Forestry and Fire Protection
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSMS	Combined Support Maintenance Shop
CSM	conceptual site model
EDR	Environmental Data Resources
°F	degrees Fahrenheit
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FMS	Field Maintenance Shop
ft	feet
FTA	fire training area
HAZMAT	hazardous materials
JP-8	jet propellant #8
NOAA	National Oceanic and Atmospheric Administration
OTIE	Oneida Total Integrated Enterprises
PA	Preliminary Assessment
PFAS	per- and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
ppt	parts per trillion
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
USGS	United States Geological Survey
UST	underground storage tank
VSI	visual site inspection

Executive Summary

The United States (US) Army Corps of Engineers (USACE) Baltimore District on behalf of the Army National Guard (ARNG)-Installations & Environment Division, Cleanup Branch contracted AECOM Technical Services, Inc. (AECOM) to perform *Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) Impacted Sites at ARNG Facilities Nationwide*. The ARNG is assessing the potential exposure to humans and the effect on the environment related to processes at facilities that used per- and poly-fluoroalkyl substances (PFAS) (a suite of related chemicals), primarily in the form of aqueous film forming foam (AFFF) released during firefighting activities or training, although other PFAS sources are possible.

AECOM completed a PA for PFAS at the Stockton Army Aviation Support Facility (AASF) in Stockton, California (CA), to assess potential PFAS release areas and exposure pathways to receptors. The performance of this PA included the following tasks:

- Reviewed available environmental reports and Environmental Data Resources (EDR), Inc. report packages to obtain information relevant to potential PFAS releases
- Conducted a 1-day site visit on 6 March 2019
- Interviewed current Stockton AASF personnel during the site visit including the CAARNG Maintenance Officer, Environmental Compliance Officer, and Safety Officer; and, a Montezuma Fire District representative
- Completed visual site inspections (VSIs) at known or suspected PFAS release locations and documented with photographs
- Identified areas of interest (AOI) 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

Three AOIs related to potential PFAS releases were identified at Stockton AASF during the PA. The AOIs are shown on **Figure ES-1** and in **Table ES-1** below:

Table ES-1: AOIs at Stockton AASF

Area of Interest	Name	Used by	Release Dates
AOI 1	Airfield	CAARNG	Potentially as early as 1992
AOI 2	Wash Rack	CAARNG	Potentially as early as 1992
AOI 3	Butler Building Parking Area	CAARNG	Potentially as early as 1992

Based on information obtained during the PA at these AOIs, there is potential for exposure to PFAS contamination in media at or near the facility.

Based on the US Environmental Protection Agency (USEPA) Unregulated Contaminant Monitoring Rule 3 (UCMR3) data, it was indicated that drinking water from the City of Lathrop public water system drinking water wells were identified to exceed USEPA Health Advisory values for PFAS. These wells lie within a 5- to 10-mile radius from the Stockton AASF. The preliminary CSM for Stockton AASF is shown on **Figure ES-2**.

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CLIENT	ARNG			
PROJECT	Preliminary Assessment for PFAS at Stockton AASF, CA			
REVISED	12/5/2019	GIS BY	MS	12/5/2019
SCALE	1:12,000	CHK BY	ST	12/5/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	12/5/2019

Legend

- Area of Interest
- Potential PFAS Release
- No Suspected Release
- Facility Boundary
- Water Body
- River/Stream
- Canal/Ditch

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Summary of Findings

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Figure ES-1

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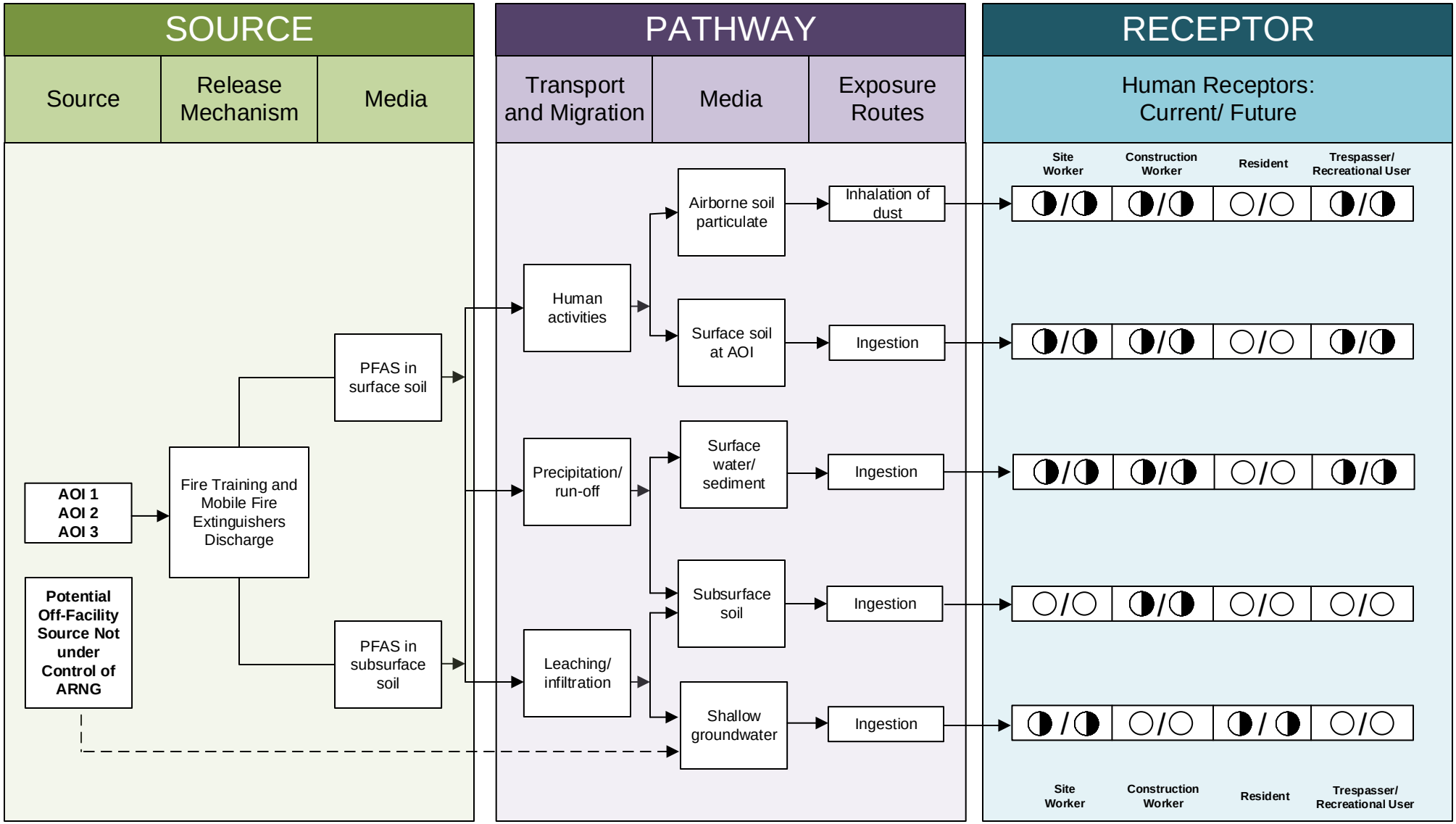

LEGEND

- Flow-chart stops
- Flow-chart continues
- Partial/ possible flow
- Incomplete pathway
- Possible complete pathway
- Complete pathway

Notes:

1. The resident receptor refers to an off-site resident.

2. Current risk practice suggests the exposure pathway for dermal contact is insignificant compared to ingestion, but supporting data is sparse and continues to be studied.

Figure ES-2
Preliminary Conceptual Site Model
Stockton AASF

1. Introduction

1.1 Authority and Purpose

The United States (US) Army Corps of Engineers (USACE) Baltimore District on behalf of the Army National Guard (ARNG)-Installations & Environment Division, Cleanup Branch contracted AECOM Technical Services, Inc. (AECOM) to perform *Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) Impacted Sites at ARNG Facilities Nationwide* 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) (a suite of related chemicals), primarily releases of aqueous film forming foam (AFFF) 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 these PFAS compounds in the environment will vary. The regulatory framework at both federal and state levels continues to evolve. The US Environmental Protection Agency (USEPA) issued Drinking Water Health Advisories for PFOA and PFOS in May 2016, but there are currently no promulgated national standards regulating PFAS in drinking water. In the absence of federal maximum contaminant levels, some states have adopted their own drinking water standards for PFAS. On 13 July 2018, under the authority of the Deputy Director of the Division of Drinking Water, California issued drinking water notification levels of 14 parts per trillion (ppt) for PFOA and 13 ppt for PFOS. Notification levels are non-regulatory health-based advisory levels established for contaminants in drinking water for which maximum contaminant levels have not been established.

This report presents findings of a PA for PFAS at California Army National Guard (CAARNG) Stockton Army Aviation Support Facility (AASF) in Stockton, CA, 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 Part 300), and USACE requirements and guidance.

This PA documents the known fire training areas (FTAs) as well as additional locations where PFAS may have been released to the environment at Stockton AASF. The term PFAS will be used throughout this report to encompass all PFAS chemicals being evaluated, including PFOS and PFOA, which are key components AFFF.

1.2 Preliminary Assessment Methods

The performance of this PA included the following tasks:

- Reviewed available administrative record documents and Environmental Data Resources (EDR), Inc. report packages to obtain information relevant to potential PFAS releases
- Conducted a 1-day site visit on 6 March 2019
- Interviewed current Stockton AASF personnel during the site visit including the CAARNG Maintenance Officer, Environmental Compliance Officer, and Safety Officer; and, a Montezuma Fire District representative
- Completed visual site inspections (VSIs) at known or suspected PFAS release locations and documented with photographs

- Identified areas 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 (USEPA, 1991). The report sections and descriptions of each are:

- **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 FTAs at the facility identified during the site visit.
- **Section 3** – **Non-Fire Training Areas:** describes other locations of potential PFAS releases at the facility identified during the site visit.
- **Section 4** – **Emergency Response Areas:** describes areas of potential PFAS release at the facility, specifically in response to emergency situations.
- **Section 5** – **Adjacent Sources:** describes sources of potential 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 each AOI.
- **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

Stockton AASF is located at 2000 Stimson Road, Stockton, CA 95206 and borders the Stockton Metropolitan Airport to the south. The Stockton Metropolitan Airport has a history of military use as a training installation, and has been formerly referred to as Stockton Field and Sharpe Army Depot Field Annex. In 1973 the US Army vacated the airport; however, the CAARNG presence remains. The AASF is situated in the Sacramento-San Joaquin Valley within the Central Valley, approximately equidistant from the Pacific Ocean and Sierra Nevada Mountains (**Figure 1-1**). The latitude, longitude, and surface elevation at the main gate of the AASF are 37°53’13.0” N; 121°14’37.2” W, and 21 feet (ft) above mean sea level (amsl), respectively.

Stockton AASF is a CAARNG aviation maintenance facility for helicopters. Impervious surfaces make up 82% of the 22-acre facility and include roadways, parking lots, helipads, and taxi lanes. Physical structures include a hangar, maintenance shop, fuel tank farm, wash rack, and equipment storage areas. Stockton AASF has been leased from the San Joaquin County since 1972 (White, T., 2019).

Four state-owned divisional areas comprise the entire CAARNG facility, including the AASF, Field Maintenance Shop (FMS) #24, Armory, and Combined Support Maintenance Shop (CSMS). However, only the AASF was specifically evaluated in this PA report. FMS #24 is a one-story maintenance building and the site of two former underground storage tanks (USTs). FMS #24 lies

adjacent to the southwest of the AASF and has been extensively investigated as a source of petroleum hydrocarbons and related compounds in soil and groundwater (Adanta-ECM Joint Venture, 2018).

1.5 Facility Environmental Setting

The areas surrounding Stockton AASF comprise light and heavy industrial areas directly north/northwest and farmlands to the east, south, and west. Few residents reside in the rural farmlands within a one mile radius of the AASF, although the community of French Camp, CA is located approximately 1.5 miles to the west. The site sits at an elevation of 26 ft amsl with a slight general topographic gradient to the west. There are no significant natural topographic features surrounding the facility.

1.5.1 Soil

As indicated in the 2019 EDR report (**Appendix A**), two major soil components were found at the Stockton AASF property. The Jacktone and Stockton soil units are both somewhat poorly drained, partially hydric clays. The deposits underlying the site are characterized by interbedded silty clays, clayey silts, sands, and silty to clayey sands (Oneida Total Integrated Enterprises [OTIE], 2010; 2013). Boring logs from previous subsurface investigations at FMS #24 encountered fine silts and clays to depths of approximately 20 to 30 ft below ground surface (bgs) overlying coarser, relatively continuous sands and silts (OTIE, 2010).

1.5.2 Geology

Stockton AASF lies in the border of the Sacramento Valley and San Joaquin Valley. Deposits found within this region are composed of unconsolidated Quaternary sediments made up of alluvial and lake deposits. The Sierra Nevada Mountains to the east and the Sacramento Valley Coast Ranges to the west are both contributing sources of deposits that originate from a variety of metamorphic and sedimentary rocks (Adanta-ECM Joint Venture, 2018). The uppermost geologic unit comprises marine and nonmarine (continental) sedimentary rocks (**Figure 1-2**). The Stockton Fault (trending northeast-southwest) is located within Stockton city limits; the Midland Fault Zone (trending north) is located approximately 25 miles northwest of Stockton AASF (OTIE, 2010). The Stockton fault forms the divide between the Sacramento and the San Joaquin Valleys.

1.5.3 Hydrogeology

Stockton AASF is located within the San Joaquin Groundwater Basin, which contains several water-bearing zones within the upper 700 to 800 ft of unconsolidated fill. Shallow groundwater primarily occurs in unconfined conditions, although it may occur in semi-confined condition due to the distribution of clay lenses in the sediments. Based on historical investigations performed in the vicinity of the AASF, coarser sediments are generally discontinuous in the lateral and vertical direction above the groundwater table and more laterally continuous below the groundwater table (Versar, Inc., 2004; URS Corporation, 2007; OTIE, 2010, 2012, 2013; Environmental Cost Management, Inc., 2015).

According to the California Water Board Groundwater Ambient Monitoring and Assessment Program database, multiple public water system wells are located within a 4-mile radius. A public water system well is defined as serving “15 or more connections or more than 25 people per day” (California Water Board, 2019). Drinking water wells from the City of Lathrop public water system were identified in the Unregulated Contaminant Monitoring Rule 3 (UCMR3) data to exceed USEPA Health Advisory values for PFAS. These wells lie within a 5- to 10-mile radius from the Stockton AASF, and the UCMR3 data is included in **Appendix A**. Stockton AASF receives potable water from the Stockton Municipal Utilities Water Service, which derives approximately 25% of its water supply from groundwater wells, while the remaining water supply is from treated surface

water supplied by the Stockton East Water District. The locations of Stockton Municipal Utilities Water Service wells are unknown. The Stockton East Water District also supplies surface water for agricultural irrigation in the area. The Stockton East Water District sources surface water from the New Melones Reservoir and the New Hogan Reservoir, located approximately 30 and 38 miles northeast of the AASF, respectively (City of Stockton, 2019; Stockton East Water District, 2019).

No groundwater monitoring data are available for the AASF; however, the CAARNG has been monitoring groundwater at the adjoining FMS #24 site since 2010. Depth to groundwater has been generally encountered from 30 to 35 ft bgs, and the hydraulic gradient was measured at approximately 0.0015 ft/ft in 2013 (Adanta-ECM Joint Venture, 2018). Groundwater flow has been consistently measured from nine monitoring wells and two remediation wells in the north/northeast direction (ECM Consultants, 2018). In the vicinity of the site, groundwater flow in regional unconfined conditions is generally southwesterly toward the valley (Adanta-ECM Joint Venture, 2018). Groundwater features are presented on **Figure 1-2**.

1.5.4 Hydrology

The nearest surface water feature is Rydberg Creek, which wraps around the southern and western boundary of the Stockton AASF facility, flows northwest, and connects with French Camp Slough. According to the National Wetlands Inventory in the EDR report (**Appendix A**), there are no wetland areas within the AASF property. The western portion of the AASF is in the Federal Emergency Management Agency (FEMA) 100-year flood zone.

Stockton AASF lies within the Walker Slough-French Camp Slough Watershed. Storm water is diverted to storm drains inlets that are located on and around the AASF. The storm drains then discharge offsite through two discharge points into the city of the Stockton storm sewer system, which eventually leads to the San Joaquin River. The western discharge point, however, has not been observed to have any flow. Surface water that is not captured in storm drains is drained south into an adjoining ditch canal (Rydberg Creek), which is a tributary to the San Joaquin River. The closest surface water intake is along the San Joaquin River, approximately 18 miles to the northwest. Based on UCMR3 data, there were no detections of PFAS in surface water intakes for the cities of Stockton and Lathrop. The AASF has no water treatment system, and the oil water separator associated with the wash rack is connected to the Stockton sanitary sewer system (HazCon, 2017). Surface water features are presented on **Figure 1-3**.

1.5.5 Climate

Stockton AASF is in a semi-arid, Mediterranean climate zone characterized by warm, dry summers and mild winters. The average annual rainfall is approximately 13.95 inches, with the majority of the rainfall occurring between late fall and early spring. Summer temperatures peak in July, with an average high of 94 degrees Fahrenheit (°F) and an average low of 61 °F. Winter temperatures are lowest in December to January and range from 53 °F during the day to 37 °F at night. Prevailing wind speeds are westerly or northwesterly for nine months out of the year and southeasterly for three months out of the year (National Oceanic and Atmospheric Administration [NOAA], n.d.).

1.5.6 Current and Future Land Use

The Stockton AASF serves as a CAARNG aviation maintenance facility for helicopters. The AASF includes a maintenance hangar, various storage buildings, and related infrastructure including parking lots, aircraft parking areas, wash rack, and refueling pads. The AASF is categorized as a small-quantity hazardous waste generator because it manages a variety of hazardous materials. Operating hours are from 0700 hours to 1630 hours Monday through Friday, and the AASF is

staffed by approximately 95 CAARNG personnel (HazCon, 2017). Reasonably anticipated future land use is not expected to change from the current land use described above.

CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Stockton AASF, CA			
REVISED	5/15/2019	GIS BY	MS	5/15/2019
SCALE	1:63,360	CHK BY	ST	5/15/2019
Base Map: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI,		PM	RG	5/15/2019

Facility Location

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Figure 1-1

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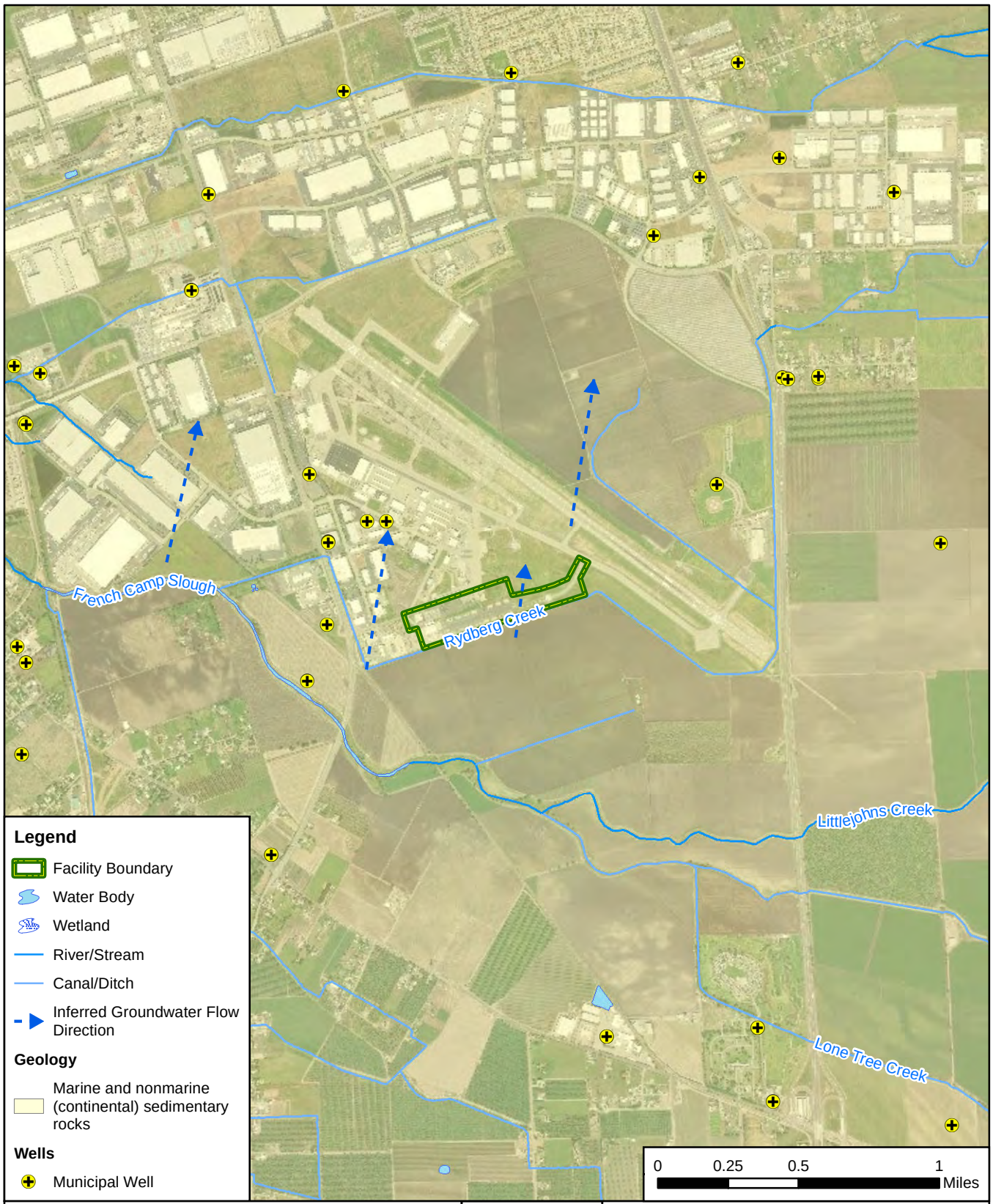

CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Stockton AASF, CA			
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Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	5/15/2019

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Groundwater Features

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Figure 1-2

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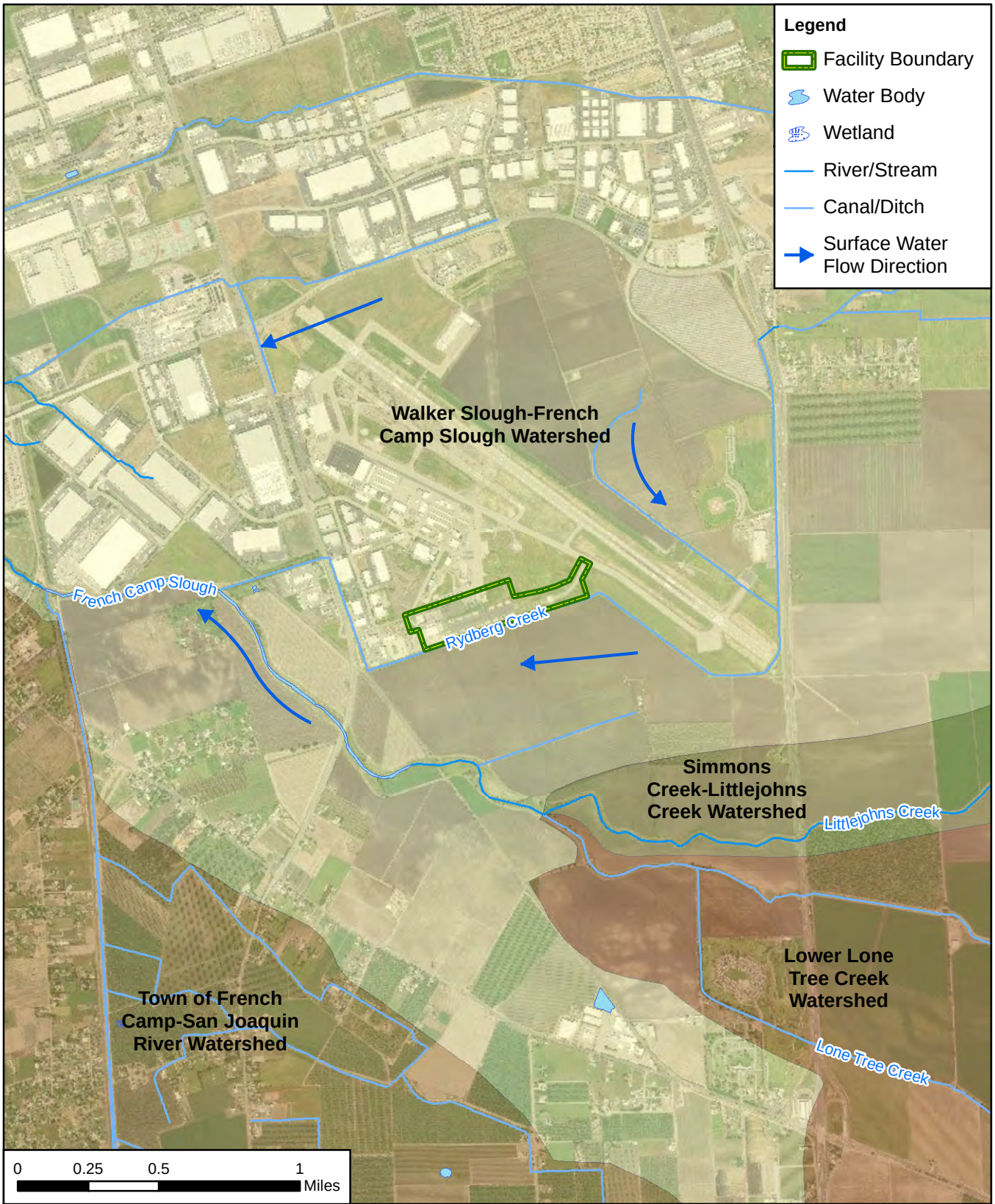

CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Stockton AASF, CA			
REVISED	5/15/2019	GIS BY	MS	5/15/2019
SCALE	1:31,680	CHK BY	ST	5/15/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	5/15/2019

Surface Water Features

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Figure 1-3

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2. Fire Training Areas

Two former FTAs were identified through record reviews and site visit interviews during the PA. A description and the location of the FTAs are shown on **Figure 2-1**. PA interview and VSI documents and photographs are included in **Appendix B** and **Appendix C**, respectively. Interviewees had direct knowledge of fire training activities covering the span of 27 years (1992 to present day).

2.1 Wash Rack

Familiarization training with the Tri-Max™ fire extinguishers occurred at the wash rack. Occasionally, these exercises would also involve extinguishing live fire from fuel that was poured and ignited in a tray pan. The contents of approximately one Tri-Max™ fire extinguisher would be emptied during each training event and then left in place to evaporate or disperse in the wind. The drains in the wash rack area lead to an oil water separator, which then flows into the Stockton sanitary sewer system. The wash rack is located at geographic coordinates 37°53'07.6"N; 121°14'36.9"W.

A hazardous materials (HAZMAT) locker is located on the southwest corner of the wash rack. During the PA site visit, eighteen 5-gallon 6% AFFF canisters of the brand FireAde Mil-Spec were observed in the HAZMAT locker. Refilling of the Tri-Max™ extinguishers also occurred in the wash rack area, but only minimal spills, if any, would have occurred during this operation. According to an interview with a Maintenance Officer, AASF personnel also used to wash out aircraft tanks at the wash rack with an unknown type and quantity of foam or soap. However, personnel stopped using the foam or soap approximately five to six years ago at the request of the California Department of Forestry and Fire Protection (CAL FIRE) due to environmental reasons. One Tri-Max™ fire extinguisher was also observed stationed nearby the HAZMAT locker.

The AASF personnel interviewed could not recall specific dates of training exercises, but they could recall the occurrence of training exercises during their entire tenure at the facility, with the longest tenure extending back to 1992. The training exercises occurred at an annual frequency until approximately 2010. After 2010, the exercises occurred less frequently because the Tri-Max™ fire extinguishers used in the exercises began breaking down. According to an interview with the Safety Officer, the Tri-Max™ fire extinguishers tended to break down every five years, since proper safety inspection was not often performed on them. However, no leak from the Tri-Max™ fire extinguishers was ever reported.

There was some uncertainty regarding the contents of the Tri-Max™ fire extinguishers used during training activities. The Environmental Compliance Officer, whose knowledge extends back to 1992, stated that 3% AFFF was used until recently, when the AASF acquired 6% AFFF of the brand FireAde Mil-Spec. The Safety Officer, whose knowledge extends back to 2004, stated that sometimes the Tri-Max™ fire extinguishers would be filled with soap and water rather than AFFF. Another Maintenance Officer with knowledge extending back to the 2000s claimed that training was conducted with water, not foam, because the Tri-Max™ fire extinguishers were hard to refill.

2.2 Butler Building Parking Fire Training Area

The parking area west of the Aviation Maintenance Storage Facility, referred to as the "Butler Building" by AASF staff, is a paved lot that runs northwest to southeast. The site was used for fire training activities that involved extinguishing live fire from jet propellant #8 (JP-8) fuel that was poured and then ignited in tray pans. The training exercises were facilitated by the Montezuma Fire District, but the AASF provided the Tri-Max™ fire extinguishers that were used to extinguish the fire. The contents of approximately one Tri-Max™ fire extinguisher would be emptied during

each training event and then left in place to evaporate or disperse in the wind. The parking area is located at geographic coordinates 37°53’10.8”N; 121°14’39.2”W.

The AASF personnel interviewed could not recall specific dates of fire training exercises, but they could recall the occurrence of fire training exercises during their entire tenure at the facility, with the longest tenure extending back to 1992. The fire training exercises occurred at an annual frequency until approximately 2010 to 2012, when the Butler Building was in construction. During construction, the soil beneath and in the vicinity of the parking lot was disturbed, and the area was regraded. The original soil was either left in place or used to fill in a depression that was west of the road next to the Butler Building. After construction, the area was more prone to flooding, so fire training activities in the parking lot ceased.

There was some uncertainty regarding the contents of the Tri-Max™ fire extinguishers used during fire training activities. The Environmental Compliance Officer, whose knowledge extends back to 1992, stated that 3% AFFF was used until recently when the AASF acquired 6% AFFF of the brand FireAde Mil-Spec. The Safety Officer, whose knowledge extends back to 2004, stated that sometimes the Tri-Max™ fire extinguishers would be filled with soap and water rather than AFFF. Another Maintenance Officer with knowledge extending back to the 2000s claimed that training was conducted with water, not foam, because the Tri-Max™ fire extinguishers were hard to refill.

During the PA site visit, potentially distressed vegetation was observed in the grassy area adjacent to the paved parking lot. Some minor flooding was also observed leading into the area from the south. The paved parking lot is in a restricted, fenced area with an access gate located on the northwest side.

CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Stockton AASF, CA			
REVISED	5/15/2019	GIS BY	MS	5/15/2019
SCALE	1:7,200	CHK BY	ST	5/15/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	5/15/2019

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Fire Training Areas

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Figure 2-1

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3. Non-Fire Training Areas

Two non-FTAs where AFFF was stored and/or potentially released were identified during the PA. Descriptions of the non-FTAs are presented below and shown in **Figure 3-1**.

3.1 AASF Hangar

The AASF Hangar is a maintenance hangar for helicopters and houses various related maintenance shops, offices, and supply rooms. The AASF Hangar is located at geographic coordinates 37°53'10.0"N; 121°14'35.6"W.

The hangar was toured during the VSI and was not found to have any storage of AFFF or contain a fire suppression system. The building is equipped with dry chemical (non-AFFF) fire extinguishers. According to interviews with AASF personnel, whose knowledge covers the period of 1992 to present day, AFFF has not been stored or used historically at the hangar.

3.2 Airfield

Training sessions where personnel would familiarize themselves with discharging the Tri-Max™ fire extinguishers, also referred to as "familiarization training", were conducted in the airfield. Personnel would stand at the flightline boundary and discharge the Tri-Max™ fire extinguishers in the northeast direction towards the center of the airfield as a measurement to see how far the discharge could go. The contents of approximately one Tri-Max™ fire extinguisher would be emptied during each training event and then left in place to evaporate or disperse in the wind. The approximate geographic coordinates of this training area are 37°53'10.6"N; 121°14'29.9"W.

The AASF personnel interviewed could not recall specific dates of the familiarization training, but they could recall the occurrence of the familiarization training during their entire tenure at the facility with the longest tenure extending back to 1992. The familiarization training occurred at an annual frequency until approximately 2010. After 2010, the exercises occurred less frequently because the Tri-Max™ fire extinguishers used in the exercises began breaking down. According to an interview with the Safety Officer, the Tri-Max™ fire extinguishers tended to break down every five years, since proper safety inspection was not often performed on them. However, no leak from the Tri-Max™ fire extinguishers was ever reported.

There was some uncertainty regarding the contents of the Tri-Max™ fire extinguishers used during familiarization training. The Environmental Compliance Officer, whose knowledge extends back to 1992, stated that 3% AFFF was used until recently when the AASF acquired 6% AFFF of the brand FireAde Mil-Spec. The Safety Officer, whose knowledge extends back to 2004, stated that sometimes the Tri-Max™ fire extinguishers would be filled with soap and water rather than AFFF. Another Maintenance Officer with knowledge extending back to the 2000s claimed that training was conducted with water, not foam, because the Tri-Max™ fire extinguishers were hard to refill.

Approximately 13 Tri-Max™ fire extinguishers were observed on or in the vicinity of the airfield during the VSI. Most of the Tri-Max™ extinguishers were stationed next to helipads on the airfield. At least two Tri-Max™ extinguishers were observed in the northern adjacent helicopter parking area. The Tri-Max™ extinguishers remain equipped with presumably either 3% or 6% AFFF, based on previous and current facility supplies.

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REVISED	5/15/2019	GIS BY	MS	5/15/2019
SCALE	1:7,200	CHK BY	ST	5/15/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	5/15/2019

Non-Fire Training Areas

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 3-1

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4. Emergency Response Areas

Emergency responses to crashes sometimes require flame suppression, which may result in the release of PFAS to the environment in the form of AFFF. No emergency response areas were identified within the current Stockton AASF facility during the PA through interviews with AASF personnel, whose knowledge covers the period of 1992 to present day, or EDR Reports. Aircraft and other emergency services are provided by the Montezuma Fire District.

5. Adjacent Sources

Numerous potential off-facility sources of PFAS adjacent to the Stockton AASF, not under the control of the CAARNG, were identified during the PA. A description of each adjacent source is presented below, and the adjacent sources are shown on **Figure 5-1**.

5.1 Montezuma Fire Station #18-2

The Montezuma Fire District owns and operates Fire Station #18-2 at 7422 South Lindbergh Street within the Stockton Metropolitan Airport. The fire station stores and uses 3% AFFF in fire training activities conducted at a fuel tank containment system behind the fire station and a wash rack located at geographic coordinates 37°53'25.1"N; 121°14'21.1"W. The Montezuma Fire Station #18-2 has specialized aircraft crash rescue vehicles that respond to aircraft emergencies within the Stockton Metropolitan Airport property, including the Stockton AASF, and has been identified by AASF personnel to have facilitated fire training activities at Stockton AASF.

According to an interview with a Montezuma Fire District Captain, training at the wash rack has occurred a couple times during the estimated years of 1990s-2000. Training still occurs annually at the fuel tank containment system. Training exercises typically involve nozzle spray testing using 3% AFFF for a duration of approximately 5 minutes.

5.2 French Camp Fire Station #11-1

The French Camp McKinley Fire District owns and operates out of Fire Station #11-1 at 310 East French Camp Road, French Camp, CA 95231. It is unknown whether the fire training activities utilizing AFFF have occurred at the location. Fire Station #11-1 is inferred to be in the downgradient surface water and cross-gradient groundwater flow path from the AASF. Potential AFFF releases from Fire Station #11-1 are unlikely to affect the AASF.

5.3 Stockton Metropolitan Airport Runway 29R/11L

The Stockton Metropolitan Airport is a county-owned and operated joint-civil military airport located northeast of the AASF. The airport has been historically used for various military purposes under the name Stockton Field and Sharpe Army Depot Field Annex. The US Army vacated the airport in 1973; however, the CAARNG presence remains. Today, the airport performs domestic commercial service operations, cargo operations, and a variety of general aviation operations. As a civil airport, it operates under the purview of Federal Aviation Administration (FAA) guidance. It is unknown whether AFFF training events are performed at the airport under FAA guidance, or whether training events have been performed historically.

According to a National Transportation Safety Board accident report, an accident occurred on the Stockton Metropolitan Airport Runway 29R/11L in 1969 that resulted in the use of "foam" near the west end of the runway (National Transportation Safety Board, 1969). The type of foam is not specified in the report. Because an unspecified foam was used in response to a crash on the runway, and airport runways and their surrounding spaces are a common place for required fire training events, the runway is considered an adjacent potential PFAS release area.

5.4 Private Aviation Companies at Stockton Metropolitan Airport

A number of private aviation companies are present at the Stockton Metropolitan Airport. At none of the companies could the use or storage of AFFF be determined during the PA. These companies are listed below.

- Atlantic Aviation maintains a hangar at 6364 Lindbergh St, Stockton, CA 95206.

- An Amazon Fulfillment Center is located at 4723 South B Street, Stockton, CA 95206. Stockton AASF personnel also indicated during the PA interviews that the facility is also the former location of an Atlas Air hangar. The Amazon Fulfillment Center provides air cargo services for Amazon customers in the US.
- The A. G. Spanos Jet Center is located at 4800 S Airport Way, Stockton, CA 95206. The A. G. Spanos Jet Center is a hangar containing a private fleet of jets.
- Big Valley Aviation, Inc. maintains a hangar at 7535 Lindbergh Street, Stockton, CA 95206. The company provides maintenance and overhaul services for regional helicopters and fixed wing aircrafts.
- Vintage Aircraft is a maintenance hangar and shop for vintage aircraft. The facility is located at 7432 C.E. Dixon Street, Stockton, CA 95206.

5.5 Aramark Uniform and Career Apparel, LLC

An Aramark Uniform and Career Apparel, LLC facility is located at 7679 Longe Street, Stockton, CA 95206. The facility provides uniform-related services such as uniform cleaning and fire resistant workwear. PFAS contamination from these industrial applications is unknown but possible.

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SCALE	1:15,600	CHK BY	ST	12/5/2019
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	RG	12/5/2019

Legend

- Potential PFAS Release
- Facility Boundary
- River/Stream
- Canal/Ditch

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 PA findings, there were two FTAs and one non-FTA where AFFF may have been incidentally spilled or discharged to the ground surface. As such, these AOIs may be potential PFAS source areas. The AOIs and preliminary CSMs for the AOIs are shown on **Figure 6-1** to **Figure 6-3** and summarized below.

The following AOIs were identified as a potential PFAS source area:

- AOI 1 – Airfield
- AOI 2 – Wash Rack
- AOI 3 – Butler Building Parking Area

The following sections describe the CSM components and the specific CSM developed for the AOI. The CSM identifies the three components necessary for a potentially complete exposure pathway: (1) source, (2) pathway, (3) receptor. If any of these elements are missing, the pathway is considered incomplete.

In general, the potential PFAS exposure pathways are ingestion and inhalation. Dermal contact is not considered to be a potential exposure pathway, as studies have shown very limited absorption of PFAS through the skin (National Ground Water Association, 2018). Receptors for Stockton AASF include site workers, construction workers, recreational users, and trespassers. Groundwater is too deep in the region for direct exposure to construction workers during ground-disturbing activities; however, public water system wells located within a 4-mile radius of the facility present a potential exposure pathway for groundwater to site workers and off-facility residents. The preliminary CSMs for each AOI indicate which specific receptors could potentially be exposed to PFAS.

6.1 AOI 1: Airfield

AOI 1 is the airfield where controlled AFFF releases through familiarization training have occurred annually potentially as early as 1992 and then less frequently after 2010.

AOI 1 lies within the San Joaquin Valley Groundwater Basin, and all surface water is eventually drained by tributaries to the San Joaquin River. PFAS are water soluble and can migrate readily from soil to groundwater or surface water via leaching and run-off. If PFAS releases to surface and subsurface soil occurred, it is possible that PFAS migrated from surface soil at AOI 1 to groundwater and waters in the San Joaquin River. In addition, precipitation infiltrating into the grassy surrounding areas of the AOI may cause the migration of PFAS from surface and subsurface soil to groundwater and surface water.

Ground-disturbing activities to soil at AOI 1 could result in construction worker exposure to potential PFAS contamination via inhalation of dust or ingestion of surface and subsurface soil. Inhalation of dust or ingestion of surface soil may also occur during the routine activities of site workers. Therefore, the inhalation and ingestion pathways for these receptors are considered potentially complete. Site workers, construction workers, and trespassers at the facility may be exposed to PFAS via ingestion of surface water and sediment in the San Joaquin River and its tributaries. Similarly, recreational users may be exposed to PFAS in surface water and sediment off-facility.

Due to the presence of public water system wells within a 4-mile radius of the facility, the pathway for PFAS exposure to off-facility residents via ingestion of groundwater is considered potentially complete. Because the location of Stockton Municipal Utilities Water Service groundwater wells that may serve the AASF are unknown, the pathway for PFAS exposure to site workers via

ingestion of groundwater is also considered potentially complete. The preliminary CSM for AOI 1 is shown on **Figure 6-2**.

6.2 AOI 2: Wash Rack

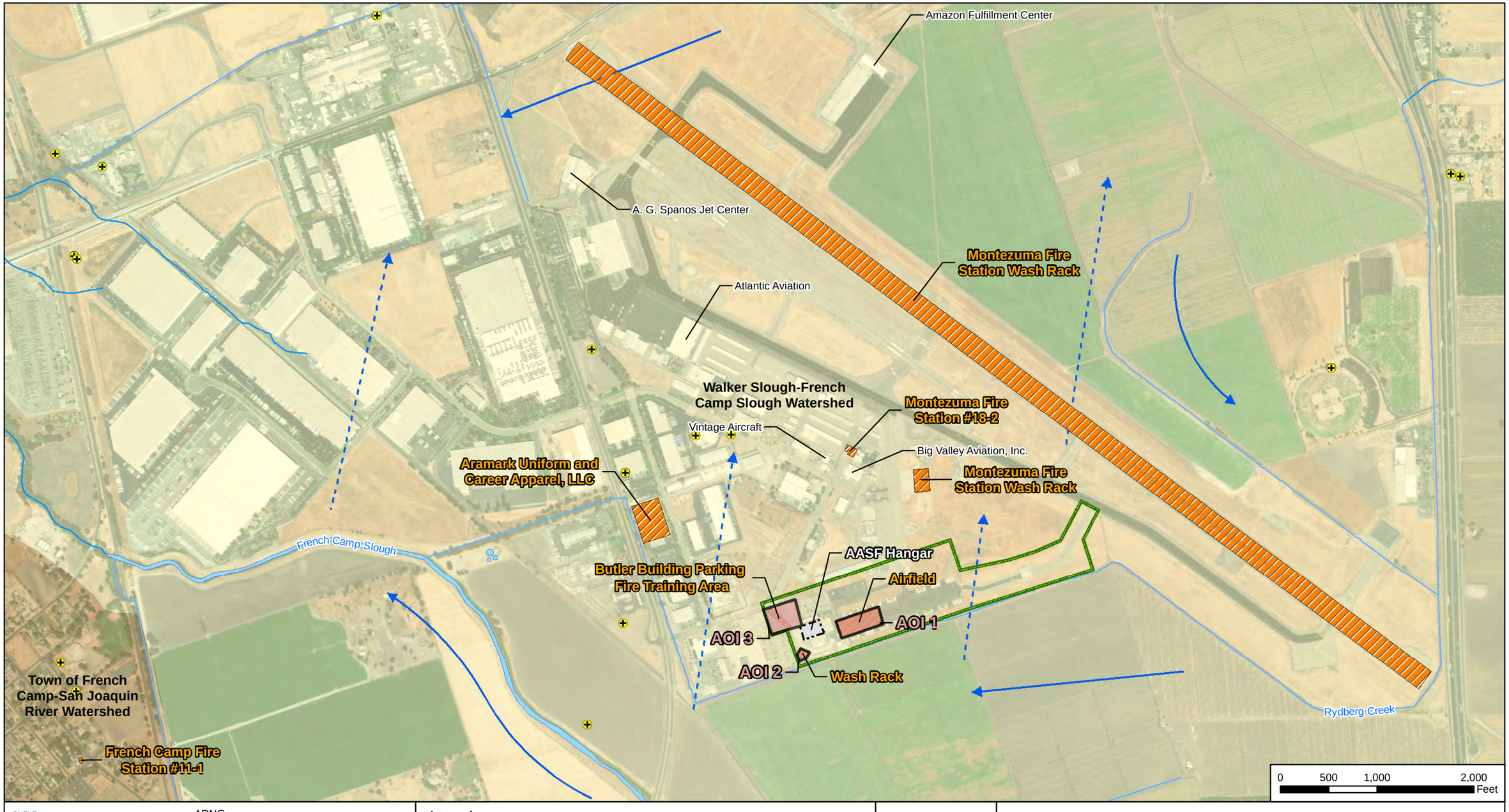
AOI 2 is the wash rack area and includes the HAZMAT locker with AFFF storage, located at the southwest corner of the wash rack. Controlled AFFF releases to the wash rack through activities related to fire training and familiarization training have occurred annually, potentially as early as 1992, and then less frequently after 2010. Potential AFFF releases from incidental spills in the wash rack area may have also occurred.

The wash rack drains lead to an oil water separator that connects to the Stockton sanitary sewer system. Therefore, discharges of AFFF in the wash rack would release directly into the sanitary sewer system. However, the HAZMAT locker is located near unpaved, grassy areas. Potential PFAS releases nearby the HAZMAT locker drains via overland surface flow to the adjacent ditch canal (Rydberg Creek), which is a tributary to the San Joaquin River. The pathways and receptors for AOI 2 are the same as described in **Section 6.1**. The preliminary CSM for AOI 2 is shown on **Figure 6-2**.

6.3 AOI 3: Butler Building Parking FTA

AOI 3 is a former FTA at what is now the parking area located east of the Butler Building. Controlled AFFF releases through fire training activities have occurred annually, potentially as early as 1992, until approximately 2010 to 2012, when the Butler Building was constructed.

Ground-disturbing activities at AOI 3 have occurred and may have resulted in construction worker exposure to potential PFAS contamination via inhalation of dust from surface soil or ingestion of surface and subsurface soil. During the construction of the Butler Building, the soil beneath and in the vicinity of the parking lot was disturbed, and the area was regraded. The original soil was either left in place or used to fill in a depression west of the road next to the Butler Building. Therefore, potentially impacted soil remains at AOI 3. The pathways and receptors for AOI 3 are the same as described in **Section 6.1**. The preliminary CSM for AOI 3 is shown on **Figure 6-3**.



CLIENT	ARNG			
PROJECT	Preliminary Assessment for PFAS at Stockton AASF, CA			
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SCALE	1:12,000	CHK BY	ST	12/5/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	12/5/2019

Legend

- Area of Interest
- Potential PFAS Release
- No Suspected Release
- Facility Boundary
- Water Body
- River/Stream
- Canal/Ditch
- Surface Water Flow Direction
- Inferred Groundwater Flow Direction
- Municipal Well

N

Area of Interest

AECOM 12420 Milestone Center Drive Germantown, MD 20876

Figure 6-1

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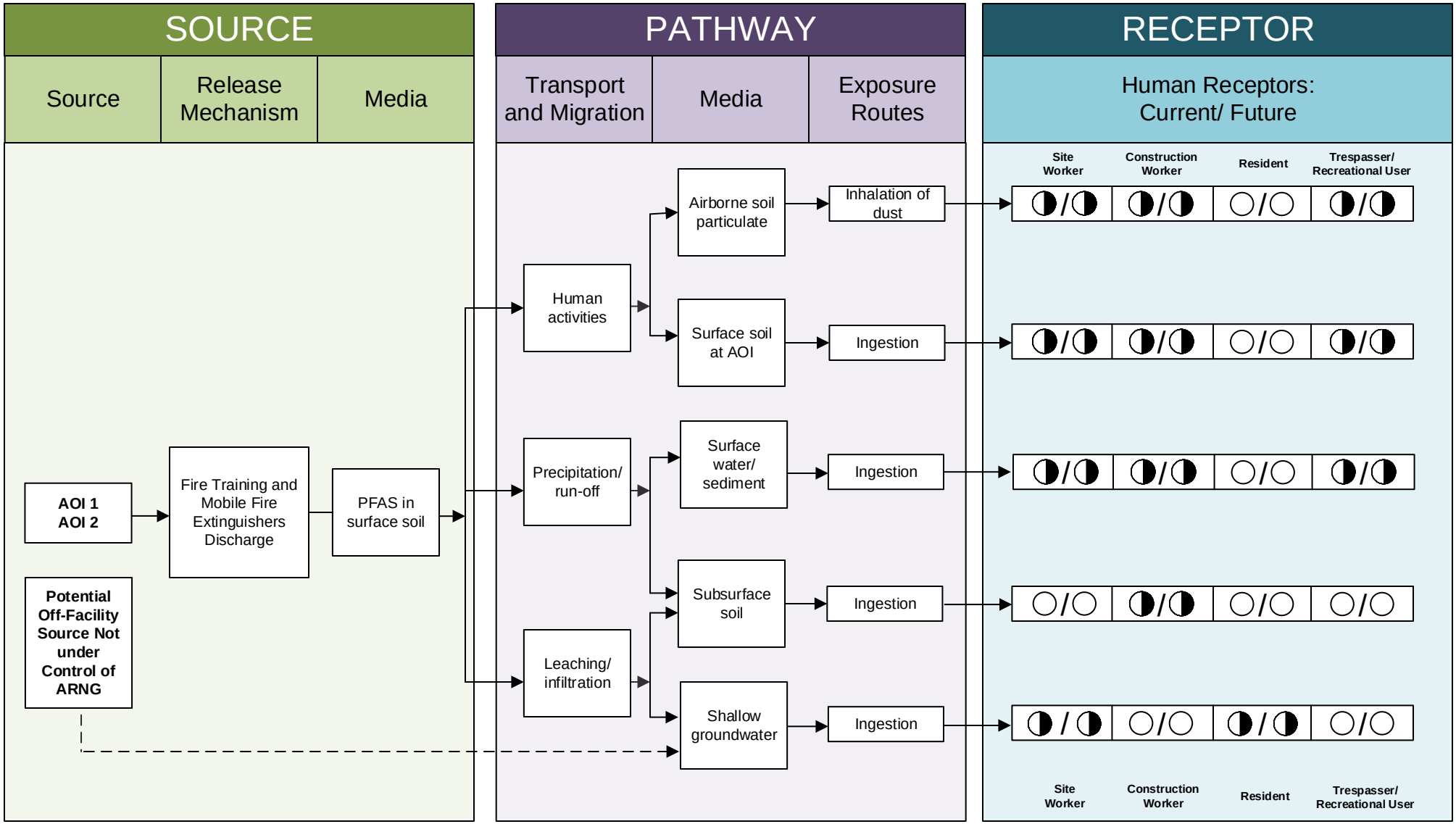


LEGEND

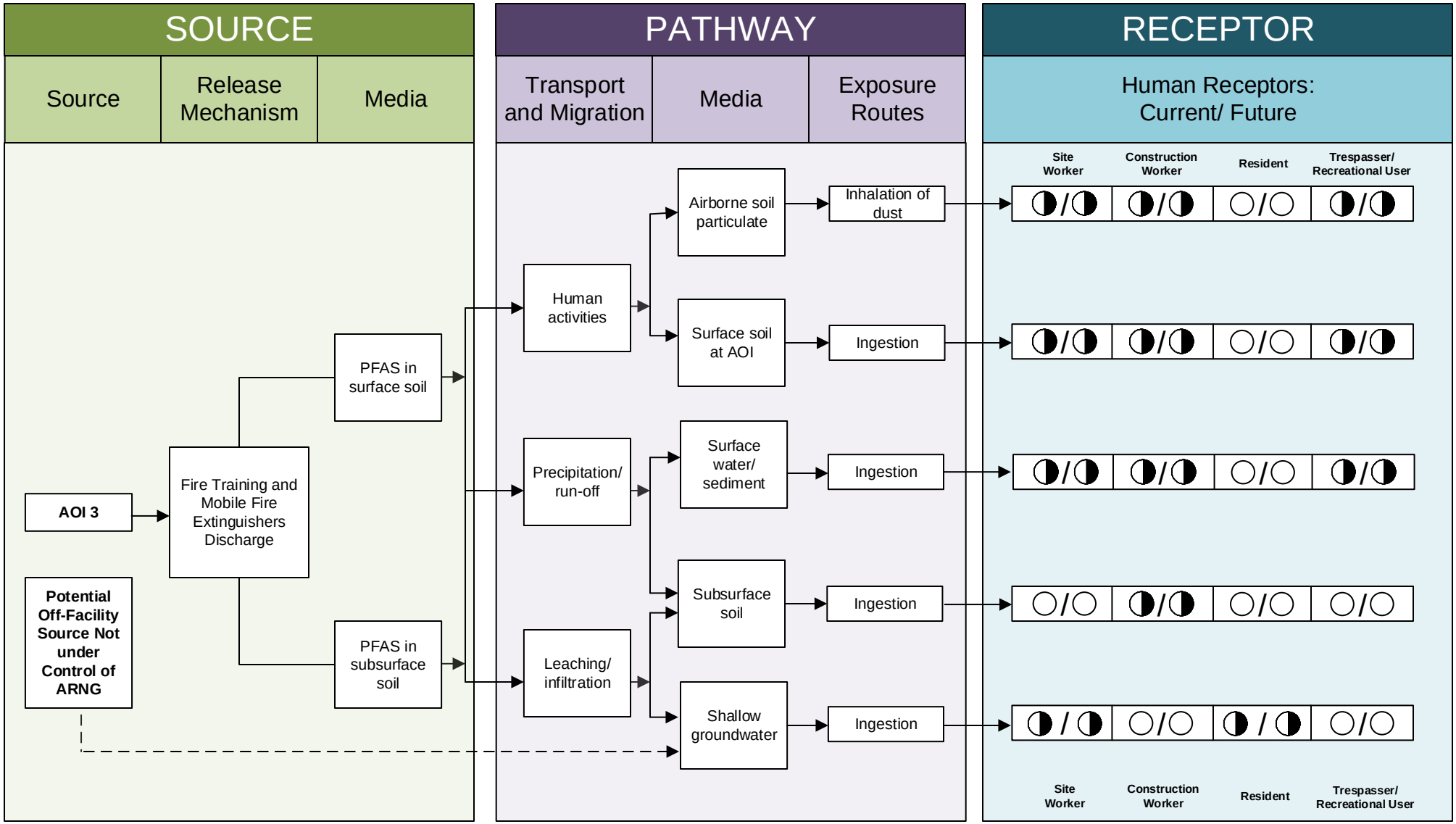
- Flow-chart stops
- Flow-chart continues
- Partial/ possible flow
- Incomplete pathway
- Possible complete pathway
- Complete pathway

Notes:

1. The resident receptor refers to an off-site resident.

2. Current risk practice suggests the exposure pathway for dermal contact is insignificant compared to ingestion, but supporting data is sparse and continues to be studied.

Figure 6-2
Preliminary Conceptual Site Model
AOI 1 & AOI 2 Airfield and Wash Rack



LEGEND

- Flow-chart stops
- Flow-chart continues
- Partial/ possible flow
- Incomplete pathway
- Possible complete pathway
- Complete pathway

Notes:

1. The resident receptor refers to an off-site resident.

2. Current risk practice suggests the exposure pathway for dermal contact is insignificant compared to ingestion, but supporting data is sparse and continues to be studied.

Figure 6-3
Preliminary Conceptual Site Model
AOI 3 Butler Building Parking FTA

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 Stockton AASF. The PA findings are based on the information presented in **Appendix A** and **Appendix B**.

7.1 Findings

Three AOIs related to potential PFAS release were identified (**Table 7-1**) at Stockton AASF during the PA (**Figure 7-1**).

Table 7-1: AOIs at Stockton AASF

Area of Interest	Name	Used by	Release Dates
AOI 1	Airfield	CAARNG	Potentially as early as 1992
AOI 2	Wash Rack	CAARNG	Potentially as early as 1992
AOI 3	Butler Building Parking Area	CAARNG	Potentially as early as 1992

The AASF Hangar at Stockton AASF was determined to have no suspected PFAS release to the environment. The hangar neither contains an AFFF deluge system nor stores AFFF historically or presently.

Numerous potential off-facility sources of PFAS were considered in the local area surrounding Stockton AASF. These include:

- Montezuma Fire Station #18-2 – stores AFFF at the fire station and conducts nozzle testing using AFFF in the fuel containment system and wash rack area within the Stockton Metropolitan Airport property
- French Camp Fire Station #11-1 – may conduct fire training activities utilizing AFFF
- Stockton Metropolitan Airport Runway 29R/11L – may be the location of historical fire training events and is the known location of an aircraft crash in which emergency response used an unknown foam extinguishant
- Private Aviation Companies – Atlantic Aviation, Amazon, A.G. Spanos Jet Center, Big Valley Aviation, Inc., and Vintage Aircraft all maintain hangars/facilities that may contain or utilize AFFF
- Aramark Uniform and Career Apparel, LLC – conducts industrial activities related to uniform manufacturing and fireproofing, which may involve PFAS-containing chemicals

The potential off-facility sources are located in the upstream surface water flow path, with the exception of French Camp Fire Station #11-1, which is located downstream from the AASF. However, the off-facility sources are located in the downgradient or cross-gradient groundwater flow path and are not expected to have impacts on groundwater at the AASF.

Based on information obtained during the PA at these AOIs, there is potential for exposure to PFAS contamination in media at or near the facility. The preliminary CSMs are shown on **Figures 6-2** and **6-3**, which presents the potential receptors and media impacted.

7.2 Uncertainties

A number of information sources were investigated during this PA to determine the potential for PFAS-containing materials to have been present, used, or released at the facility. Historically, documentation of PFAS use 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 PFAS in training, firefighting, or other non-traditional activities, or on its disposition.

The conclusions of this PA are predominantly based on the information provided during interviews with personnel who had direct knowledge of PFAS use at the facility. Sometimes, the provided information was vague or conflicted with other sources. Gathered information has a degree of uncertainty due to the absence of written documentation, the time passed since PFAS were 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, retired and current personnel were interviewed, multiple persons were interviewed for the same potential source area, and potential source areas were visually inspected.

The following **Table 7-2** summarizes the uncertainties associated with the PA.

Table 7-2: Uncertainties

Area of Interest	Source of Uncertainty
AOI 1: Airfield	It could not be confirmed whether the Tri-Max™ fire extinguishers stationed on the airfield were currently equipped with 3% or 6% AFFF.
AOI 2: Wash Rack	It is unknown if foam or soap and in what quantity were used to wash out the aircraft tanks at the wash rack. Minimal spills of AFFF may have occurred from refilling the Tri-Max™ fire extinguishers, but this could not be confirmed by site records.
AOI 3: Butler Building Parking Area	Construction plans for the Butler Building were unable to be obtained, so exact locations of soil excavations and refill could not be confirmed.
General	The AASF personnel interviewed could not recall specific dates of fire training exercises, but they could recall the occurrence of fire training exercises during their entire tenure at the facility. The longest tenure extended back to 1992, so it is unknown what occurred prior to 1992. The contents of the Tri-Max™ fire extinguishers used during fire training activities were uncertain, and interviewees had differing recollections. According to information gathered during interviews with AASF personnel, the contents of the extinguishers may have

Area of Interest	Source of Uncertainty
	contained either 3% AFFF, 6% AFFF, dishwashing soap, or water depending on the dates of usage.

7.3 Potential Future Actions

Based on the documented absence (1992 to present) of the use or release of AFFF from the AASF Hangar, evidence does not indicate that current or former ARNG activities having contributed PFAS contamination to soil, groundwater, surface water, or sediment at that location.

Interviews and records (covering 1992 to present) indicate that current or former ARNG activities may have resulted in potential PFAS releases at the three AOIs identified during the PA. Based on the preliminary CSMs developed for the AOIs, there is potential for receptors to be exposed to PFAS contamination in soil, surface water, sediment, and groundwater at these AOIs. **Table 7-3** summarizes the rationale used to determine if the AOI should be considered for further investigation under the CERCLA process and undergo an SI.

Table 7-3: PA Findings Summary

Area of Interest	AOI Location	Rationale	Potential Future Action
AOI 1: Airfield	37°53’10.6”N; 121°14’29.9”W	Confirmed usage of AFFF during annual training exercises by interviewees with direct knowledge	Proceed to an SI, focus on soil, groundwater, surface water, sediment
AOI 2: Wash Rack	37°53’07.6”N; 121°14’36.9”W	Confirmed usage of AFFF during annual training exercises by interviewees with direct knowledge and potential PFAS releases from the washing of aircraft tanks and refilling of Tri-Max™ fire extinguishers	Proceed to an SI, focus on soil, groundwater, surface water, sediment
AOI 3: Butler Building Parking Area FTA	37°53’10.8”N; 121°14’39.2”W	Confirmed usage of AFFF during annual training exercises by interviewees with direct knowledge	Proceed to an SI, focus on soil, groundwater, surface water, sediment

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

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CLIENT	ARNG			
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REVISED	12/5/2019	GIS BY	MS	12/5/2019
SCALE	1:12,000	CHK BY	ST	12/5/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	12/5/2019

Legend

- Area of Interest
- Potential PFAS Release
- No Suspected Release
- Facility Boundary
- Water Body
- River/Stream
- Canal/Ditch

N

Summary of Findings

AECOM
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Figure 7-1

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Appendix A
Data Resources

Data resources will be provided separately on CD. Data resources for Stockton AASF include:

Environmental Data Resources, Inc. Geocheck Report

- 2019 Environmental Data Resources, Inc. Geocheck Report for Stockton AASF, CA

CAARNG Leasing Information

- 2019 CA ARNG Leasing Documents E-mail from Tom White (CAARNG Real Estate Manager) to Stephanie Tjan (AECOM)

Material Safety Data Sheets

- 2019 Safety Data Sheet – Fire Service Plus, Inc. FireAde MIL 6% AFFF Fire Fighting Foam

Previous CA ARNG Stockton Investigations

- 2018 First Semi-Annual Groundwater Monitoring Report, California Army National Guard – Field Maintenance Shop #24, 8010 Airport Drive, Stockton, California
- 2018 Remedial Action Completion Report for In-Situ Chemical Injection (ISCO) and Vapor Energy Generation (VEG), California Army National Guard, Field Maintenance Shop #24, 8020 South Airport Way, Stockton, California
- 2018 Soil Gas Investigation Report, Field Maintenance Shop #24, California Army National Guard, Stockton, California

Spill Prevention, Control, and Countermeasure Plan

- 2017 Spill Prevention, Control, and Countermeasure Plan, Stockton Army Aviation Support Facility, 2000 Stimson Road, Stockton California 95206

Appendix B
Preliminary Assessment Documentation

Appendix B.1
Interview Records

PA Interview Questionnaire - Other

Facility:_StocktonAASF_____
Interviewer:__ST_____
Date/Time:_3/6/19_____

Interviewee:_ David Cardoza_____ **Title:** Administrative Captain,, Instructor, EMS Program Director **Phone Number:_**209-464-5234_____ **Email:__**captain184@montezumafire.com_____	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:

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?
Fire department trains on the airport FD property in a fuel tank area that has a containment system. They train ~annually even now. The training events consist of 5 min of shooting foam. They use 3% AFFF.
They also trained at their wash rack a couple times around the 90s-2000.

PA Interview Questionnaire - Environmental Manager

Facility:_Stockton AASF_____
Interviewer:__ST_____
Date/Time:___3/6/19_____

Interviewee:__ _____ **Title:__**Safety Officer**_____** **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 _____

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

Been at facility since 1998

2. Where can I find previous facility ownership information?

Building built in 1992 but the other building has been here since WWII

Mike Gamino would have facility ownership info

3. What can you tell us about the history of PFAS including aqueous film forming foam (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
   Fire Training Areas **Three FTAs – 1) outside Butler Building, 2) wash rack, 3) airfield**
   Firefighting (Active Fire)
   Crash
   Fire Suppression Systems (Hangers/Dining Facilities)
   Fire Protection at Fueling Stations
   Non-Technical/Recreational/ Pest Management
   Metals Plating Facility
   Waterproofing Uniforms (Laundry Facilities)
   Other **Altas Hangar, Spanos Jet Center, Airport FD**

4. Fill out CSM Information worksheet with the Environmental Manager.

5. 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 the AFFF/suppression system? Do you have "As Built" drawings for the buildings?

No

PA Interview Questionnaire - Environmental Manager

Facility:_Stockton AASF_____
Interviewer:__ST_____
Date/Time:___3/6/19_____

6. Are fire suppression systems currently charged with AFFF or have they been retrofitted for use of high expansion foam? If retrofitted, when was that done?

No

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

They would purchase with government purchasing card. The disposal would be taken care of by the environmental compliance team.

8. 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)?

See copies of SDS. However, the SDS given to us may not be the same as what was used historically.

9. 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?

5 gallon buckets in HAZMAT locker, concentrated version

10. 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?

Exercises were conducted approximately annually until ~2010; afterwards the exercises slowed down because the Tri-Maxes started breaking down (they never received regular safety inspection).

D. Harvey believes the training was done with air and water not foam because the Tri-Maxes were hard to refill with foam. This was decided by the Fire Department. His knowledge goes back to the 2000s.

PA Interview Questionnaire - Environmental Manager

Facility:_Stockton AASF_____
Interviewer:__ST_____
Date/Time:___3/6/19_____

11. When a release of AFFF occurs during a fire training exercise, now and in the past, how is 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?

Just left it to evaporate

12. Can you recall specific times when city, county, and/or state personnel came on-post for training? If so, please state which state/county agency or military entity? Do you have any records, including photographs to share with us?

Municipal FD only came on-site for the FTA #1. FD just facilitated, and the foam for the exercise was provided by ARNG.

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

Not near facility

14. Did individual units come 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?

No

15. 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?

Can't remember

PA Interview Questionnaire - Environmental Manager

Facility:_Stockton AASF_____
Interviewer:__ST_____
Date/Time:___3/6/19_____

16. 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?

Never washed fuel spills with AFFF.

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

No

18. Are there mutual aid/use agreements between county, city, and local fire department? Please list, even if informal. If formalized, may we have a copy of the agreement?

No

19. 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 treatment plants, and AFFF ponds)?

Tri-Maxes used to be stored on airfield and at fuel farm.

20. Are you aware of any other creative uses of AFFF? If so, how was AFFF used? What entities were involved?

D. Harvey – back in the 90s, they used foam (or soap) on aircraft tanks to wash them out at the wash rack. This happened until 5-6 years ago when CalFire told them to stop using foam because of environmental reasons.

PA Interview Questionnaire - Environmental Manager

Facility:_Stockton AASF_____
Interviewer:__ST_____
Date/Time:___3/6/19_____

21. Are there past studies you are aware of with environmental information on plants/animals/ groundwater/soil types, etc., such as Integrated Cultural Resources Management Plans or Integrated Natural Resources Management Plans?
22. What other records might be helpful to us (environmental compliance, investigation records, admin record) and where can we find them?
23. Do you have or did you have a chrome plating shop on base? What were/are the years of operation of that chrome plating shop?
24. Do you know whether the shop has/had a foam blanket mist suppression system or used a fume hood for emissions control? If foam blanket mist suppression was used, where was the foam stored, mixed, applied, etc.?
25. 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?

PA Interview Questionnaire - Environmental Manager

Facility:_Stockton AASF_____
Interviewer:__ST_____
Date/Time:___3/6/19_____

26. Do you recommend anyone else we can interview? If so, do you have contact information for them?

Mike Gamino

PA Interview Questionnaire - Other

Facility:_Stockton AASF_____
Interviewer:__ST_____
Date/Time:__3/6/19_____

Interviewee:___Mike Gamino_____ **Title:**_1SG, ECO_____ **Phone Number:**__209-983-5339_____ **Email:**___michael.j.gamino.mil@mail.mil__	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:	
Mechanic up until 2015 and then environmental officer; been at facility since 1992	
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?	
Confirmed three FTAs on-facility	
Muncipal FD also came to the airfield last year to do some training with aircraft but never released foam. Training was just to get familiar with aircraft emergencies.	
Fire training was conducted approximately yearly with one Tri-Max being used up per event.	
Believes the foam was 3%. The new milspec is currently 6% but that came in only recently.	

Appendix B.2
Visual Site Inspection Checklists

Visual Site Inspection Checklist

Names(s) of people performing VSI: S Tjan, B Packer

Recorded by: S. Tjan

ARNG Contact: B Packer, M Garmo

Date and Time: 3/6/19 @ 0930

Method of visit (walking, driving, adjacent): walking

Source/Release Information

Site Name / Area Name / Unique ID: Airfield

Site / Area Acreage:

Historic Site Use (Brief Description): helipad, aircraft parking, fire training activities

Current Site Use (Brief Description): same as above

Physical barriers or access restrictions: perimeter fence

1. Was PFAS used (or spilled) at the site/area? [Y/N]

1a. If yes, document how PFAS was used and usage time (e.g., fire fighting training 2001 to 2014):

fire training annually until 2010 and then a few times after that

2. Has usage been documented? [Y/N]

2a. If yes, keep a record (place electronic files on a disk):

3. What types of businesses are located near the site? Industrial / ~~Commercial~~ / Plating / Waterproofing / ~~Residential~~

3a. Indicate what businesses are located near the site

Stockton Metropolitan Airport, Aramark

4. Is this site located at an airport/flightline? [Y/N]

4a. If yes, provide a description of the airport/flightline tenants:

Atlantic Aviation, Spanos Jet Center, Amazon, Montezuma Fire Station

Visual Survey Inspection Log

Other Significant Site Features:

1. Does the facility have a fire suppression system? Y / N

1a. If yes, indicate which type of AFFF has been used:

1b. If yes, describe maintenance schedule/leaks:

1c. If yes, how often is the AFFF replaced:

1d. If yes, does the facility have floor drains and where do they lead? Can we obtain an as built drawing?

Transport / Pathway Information

Migration Potential:

1. Does site/area drainage flow off installation? Y / N

1a. If so, note observation and location:

into drainage ditch & in storm drains

2. Is there channelized flow within the site/area? Y / N

2a. If so, please note observation and location:

drainage ditch South

3. Are monitoring or drinking water wells located near the site? Y / N

3a. If so, please note the location:

4. Are surface water intakes located near the site? Y / N

4a. If so, please note the location:

5. Can wind dispersion information be obtained? Y / N

5a. If so, please note and observe the location.

6. Does an adjacent non-ARNG PFAS source exist? Y / N

6a. If so, please note the source and location.

Montezuma Fire Station

6b. Will off-site reconnaissance be conducted? Y / N

Visual Survey Inspection Log

Significant Topographical Features:

1. Has the infrastructure changed at the site/area? Y / (N)

1a. If so, please describe change (ex. Structures no longer exist):

2. Is the site/area vegetated? (Y) / N

2a. If not vegetated, briefly describe the site/area composition:

grassy areas adjacent to airfield

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:

Receptor Information

1. Is access to the site restricted? (Y) / N

1a. If so, please note to what extent:

AASF perimeter fence

2. Who can access the site? (Site Workers) / (Construction Workers) / Trespassers / Residential / Recreational Users / Ecological

2a. Circle all that apply, note any not covered above:

3. Are residential areas located near the site? (Y) / N

3a. If so, please note the location/distance:

very few rural residents

4. Are any schools/day care centers located near the site? Y / (N)

4a. If so, please note the location/distance/type:

5. Are any wetlands located near the site? Y / (N)

5a. If so, please note the location/distance/type:

Visual Survey Inspection Log

Additional Notes

Photographic Log

Photo ID/Name	Date & Location	Photograph Description

Visual Site Inspection Checklist

Names(s) of people performing VSI: S. Tjan, B. Packer

Recorded by: S. Tjan

ARNG Contact: B. Packer, M. Garnio

Date and Time: 3/6/19 @ 0930

Method of visit (walking, driving, adjacent): Walking

Source/Release Information

Site Name / Area Name / Unique ID: Butler Building parking Area

Site / Area Acreage:

Historic Site Use (Brief Description): training w/ Tri-Max extinguishers using active fire, vehicle storage & parking

Current Site Use (Brief Description): vehicle parking

Physical barriers or access restrictions: access gate and fence

1. Was PFAS used (or spilled) at the site/area? **Y / N**

1a. If yes, document how PFAS was used and usage time (e.g., fire fighting training 2001 to 2014):

fire training anually until 2010-2012

2. Has usage been documented? **Y / N**

2a. If yes, keep a record (place electronic files on a disk):

3. What types of businesses are located near the site? **Industrial / Commercial / Plating / Waterproofing / Residential**

3a. Indicate what businesses are located near the site

Stockton Metropolitan Airport, Aramark

4. Is this site located at an airport/flightline? **Y / N**

4a. If yes, provide a description of the airport/flightline tenants:

Atlantic Aviation, Sparos Jet Center, Amazon, Montezuma Fire Station

Visual Survey Inspection Log

Other Significant Site Features:

1. Does the facility have a fire suppression system? Y / (N)

1a. If yes, indicate which type of AFFF has been used:

1b. If yes, describe maintenance schedule/leaks:

1c. If yes, how often is the AFFF replaced:

1d. If yes, does the facility have floor drains and where do they lead? Can we obtain an as built drawing?

Transport / Pathway Information

Migration Potential:

1. Does site/area drainage flow off installation? (Y) / N

1a. If so, note observation and location:

drainage ditch & storm drains

2. Is there channelized flow within the site/area? Y / (N)

2a. If so, please note observation and location:

3. Are monitoring or drinking water wells located near the site? Y / (N)

3a. If so, please note the location:

4. Are surface water intakes located near the site? Y / (N)

4a. If so, please note the location:

5. Can wind dispersion information be obtained? Y / (N)

5a. If so, please note and observe the location.

6. Does an adjacent non-ARNG PFAS source exist? (Y) / N

6a. If so, please note the source and location.

Montezuma Fire Station

6b. Will off-site reconnaissance be conducted? Y / (N)

Visual Survey Inspection Log

Significant Topographical Features:

1. Has the infrastructure changed at the site/area? (Y) N

1a. If so, please describe change (ex. Structures no longer exist):

Butler Building Constructed in 2010-2012, Soil excavated & refilled

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:

Some vegetative stress

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:

just south of gate was a puddle

Receptor Information

1. Is access to the site restricted? (Y) N

1a. If so, please note to what extent:

access gate & fence

2. Who can access the site? **Site Workers / Construction Workers / Trespassers / Residential / Recreational Users / Ecological**

2a. Circle all that apply, note any not covered above:

3. Are residential areas located near the site? Y (N)

3a. If so, please note the location/distance:

4. Are any schools/day care centers located near the site? Y / (N)

4a. If so, please note the location/distance/type:

5. Are any wetlands located near the site? Y / (N)

5a. If so, please note the location/distance/type:

Visual Survey Inspection Log

Additional Notes

Photographic Log

Photo ID/Name	Date & Location	Photograph Description

Visual Site Inspection Checklist

Names(s) of people performing VSI: S. Tjan, B. Packer

Recorded by: S. Tjan

ARNG Contact: B. Packer, M. Graniso

Date and Time: 3/6/19 @ 0930

Method of visit (walking, driving, adjacent): walking

Source/Release Information

Site Name / Area Name / Unique ID: Wash Rack

Site / Area Acreage:

Historic Site Use (Brief Description): Training w/ Tri-Max extinguishers, aircraft washing, HAZMAT storage

Current Site Use (Brief Description): same as above

Physical barriers or access restrictions: perimeter fence

1. Was PFAS used (or spilled) at the site/area? (Y) N

1a. If yes, document how PFAS was used and usage time (e.g., fire fighting training 2001 to 2014):

fire training annually until 2010 and then a few times after that

2. Has usage been documented? Y / (N)

2a. If yes, keep a record (place electronic files on a disk):

3. What types of businesses are located near the site? **(Industrial) / (Commercial) / Plating / Waterproofing / (Residential)**

3a. Indicate what businesses are located near the site

Stockton Metropolitan Airport, Aramark

4. Is this site located at an airport/flightline? (Y) N

4a. If yes, provide a description of the airport/flightline tenants:

Atlantic Aviation, Spanos Jet Center, Amazon, ~~Montezuma~~ ST Montezuma Fire Station

Visual Survey Inspection Log

Other Significant Site Features:

1. Does the facility have a fire suppression system? Y / N

1a. If yes, indicate which type of AFFF has been used:

1b. If yes, describe maintenance schedule/leaks:

1c. If yes, how often is the AFFF replaced:

1d. If yes, does the facility have floor drains and where do they lead? Can we obtain an as built drawing?

Transport / Pathway Information

Migration Potential:

1. Does site/area drainage flow off installation? Y / N

1a. If so, note observation and location:

into drainage ditch & in storm drains.

2. Is there channelized flow within the site/area? Y / N

2a. If so, please note observation and location:

drainage ditch just South

3. Are monitoring or drinking water wells located near the site? Y / N

3a. If so, please note the location:

no potable wells

4. Are surface water intakes located near the site? Y / N

4a. If so, please note the location:

5. Can wind dispersion information be obtained? Y / N

5a. If so, please note and observe the location.

6. Does an adjacent non-ARNG PFAS source exist? Y / N

6a. If so, please note the source and location.

Montezuma Fire Station

6b. Will off-site reconnaissance be conducted? Y / N

Visual Survey Inspection Log

Significant Topographical Features:

1. Has the infrastructure changed at the site/area? Y / (N)

1a. If so, please describe change (ex. Structures no longer exist):

2. Is the site/area vegetated? (Y) / N

2a. If not vegetated, briefly describe the site/area composition:

just past wash rack & before lockers are grassy areas

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:

Receptor Information

1. Is access to the site restricted? (Y) / N

1a. If so, please note to what extent:

AASF perimeter fence

2. Who can access the site? **Site Workers / Construction Workers / Trespassers / Residential / Recreational Users / Ecological**

2a. Circle all that apply, note any not covered above:

3. Are residential areas located near the site? (Y) / N

3a. If so, please note the location/distance:

very few rural residents

4. Are any schools/day care centers located near the site? Y / (N)

4a. If so, please note the location/distance/type:

5. Are any wetlands located near the site? Y / (N)

5a. If so, please note the location/distance/type:

Visual Survey Inspection Log

Additional Notes

Photographic Log

Photo ID/Name	Date & Location	Photograph Description

Appendix B.3
Conceptual Site Model Information

Preliminary Assessment – Conceptual Site Model Information

Site Name: Stockton MASF

Why has this location been identified as a site?

AFFF was stored and used at the facility

Are there any other activities nearby that could also impact this location?

Nearby Stockton Metropolitan Airport with multiple aviation tenants

Training Events

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

If so, how often? ~ annually until 2010, afterwards just occassionally

How much material was used? Is it documented? Usually one Tri-Max per training event

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? into storm drains or south towards drainage ditch

Average rainfall? 13.95 inches

Any flooding during rainy season? yes

Direct or indirect pathway to ditches? direct

Direct or indirect pathway to larger bodies of water? indirect to San Joaquin River

Does surface water pond any place on site? no

Any impoundment areas or retention ponds? no

Any NPDES location points near the site? no

How does surface water drain on and around the flight line? into storm drains on north and South end of flight line

Preliminary Assessment – Conceptual Site Model Information

Groundwater:

Groundwater flow direction? north /northeast

Depth to groundwater? 30 - 35 ft bgs

Uses (agricultural, drinking water, irrigation)? agricultural & drinking water partially sourced from GW

Any groundwater treatment systems? no

Any groundwater monitoring well locations near the site? yes, at FMS #24

Is groundwater used for drinking water? partially sourced (~25%) in city district

Are there drinking water supply wells on installation? no

Do they serve off-post populations? no

Are there off-post drinking water wells downgradient possible

Waste Water Treatment Plant:

Has the installation ever had a WWTP, past or present? no

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

Do we understand the fate of sludge waste?

Is surface water from potential contaminated sites treated?

Equipment Rinse Water

1. Is firefighting equipment washed? Where does the rinse water go?

no

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?

tested during familiarization training at airfield which leads to storm drains

3. Other?

Preliminary Assessment – Conceptual Site Model Information

Identify Potential Receptors:

Site Worker partially complete

Construction Worker partially Complete

Recreational User partially complete, downgradient San Joaquin River

Residential incomplete, few rural residences

Child incomplete

Ecological partially Complete, downgradient San Joaquin River

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

Stockton Metropolitan Airport, agricultural, industrial

Documentation

Ask for Engineering drawings (if applicable).

Has there been a reconstruction or changes to the drainage system? When did that occur?

Appendix C
Photographic Log

Appendix C - Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Stockton AASF	Stockton, California

Photograph No. 1

Date 3/6/2019

Time 9:42

Description:

Fire training area shown just past the fence and west of the Butler Building; some flooding and vegetative stress is observed

Orientation:

Northwest

Photograph No. 2

Date 3/6/2019

Time 9:45

Description:

Wash rack area with HAZMAT locker and Tri-Max 30 mobile fire extinguisher in distance

Orientation:

Southeast

Appendix C - Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Stockton AASF	Stockton, California

Photograph No. 3

Date 3/6/2019

Time 9:46

Description:
Tri-Max 30 mobile fire extinguishers found parked nearby the AASF Airfield

Orientation:
Southwest

Photograph No. 4

Date 3/6/2019

Time 9:47

Description:
Multiple 5-gallon buckets of 6% AFFF FireAde 2000 Mil Spec observed in the HAZMAT locker

Orientation:
Northwest

Appendix C - Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Stockton AASF	Stockton, California

Photograph No. 5

Date 3/6/2019

Time 9:51

Description:
Fire training area shown on the airfield

Orientation:
Northeast

Photograph No. 6

Date 3/6/2019

Time 10:07

Description:
A dry chemical (non-AFFF) fire extinguisher observed in the Maintenance Hangar

Orientation:
Southeast