FINAL
Preliminary Assessment Report
Cheyenne Army Aviation Support Facility
Las Vegas, Nevada

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

July 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
AECOM	AECOM Technical Services, Inc.
AFFF	aqueous film forming foam
AOI	Area of Interest
ARNG	Army National Guard
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and LiabilityAct
CFR	Code of Federal Regulations
CSM	conceptual site model
EDR™	Environmental Data Resources, Inc. ™
°F	degrees Fahrenheit
FTA	Fire Training Areas
HA	Health Advisory
NVARNG	Nevada Army National Guard
PA	Preliminary Assessment
PFAS	per- and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
SI	Site Inspection
US	United States
USACE	United States Army Corps of Engineers
UCMR3	Unreguated Contaminant Monitoring Rule 3
USDA	United States Department of Agriculture
USGS	United States Geological Survey
USEPA	United States Environmental Protection Agency

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 Cheyenne Army Aviation Support Facility (AASF; also referred to as the "facility") in Las Vegas, Nevada, to identify areas of known or suspected releases known as Areas of Interest (AOIs) and possible exposure pathways to receptors. The 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 1-day PA site visit on 20 September 2019 and completed visual site inspections at locations where PFAS-containing materials were suspected of being stored, used, or disposed;
- Interviewed current AASF Nevada ARNG (NVARNG) personnel during the site visit and NVARNG environmental managers and operations staff;
- Identified 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.

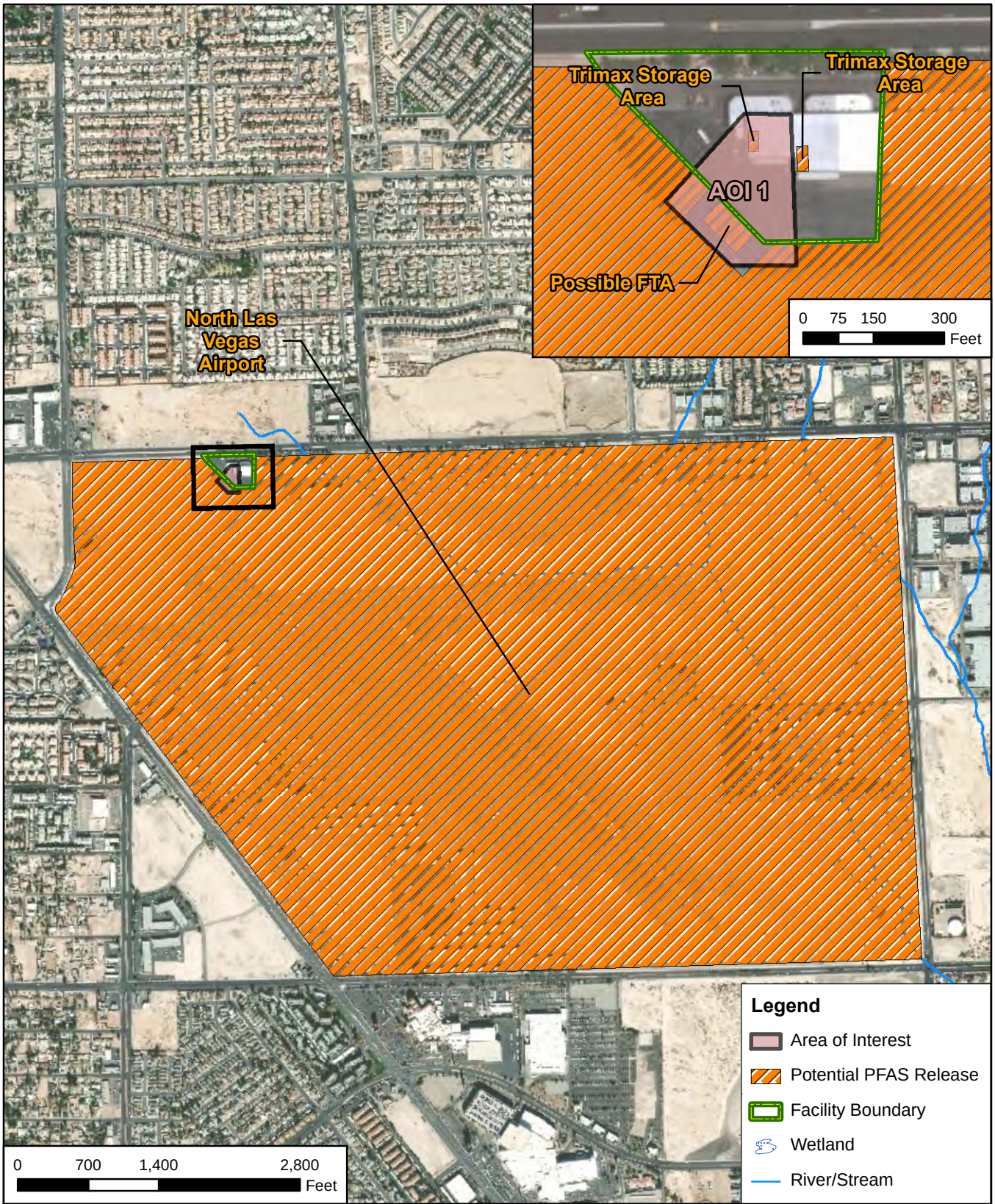
One AOI related to a PFAS release was identified at the Cheyenne AASF, based on PA data. The AOI is shown on **Figure ES-1** and described in the **Table ES-1** below:

Table ES-1: Areas of Interest

Area of Interest	Name	Used by	Potential Release Dates
AOI 1	Hangar 1 and Helipad Area	NVARNG	Prior to 2003

Based on the potential for AFFF release at this AOI, there is potential for exposure to PFAS contamination in airborne soil particulate and surface soils to trespassers, site and construction workers via inhalation and ingestion, and in subsurface soil to construction workers. Groundwater is an incomplete pathway; the city pulls only 10% of its water from deeper aquifers that are protected by an aquitard. Based on the United States (US) Environmental Protection Agency (USEPA) Unregulated Contaminant Monitoring Rule 3 (UCMR3) data, it was indicated that no PFAS were detected in a public water system above the USEPA lifetime Health Advisory within 20 miles of the facility. The HA is 70 parts per trillion for PFOA and PFOS, individually or combined. 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.

One adjacent off-facility potential PFAS release area was identified, which includes an emergency response area from a plane crash in 2013. As a result of adjacent PFAS releases, it is possible PFAS are in site media surrounding the AASF. The preliminary conceptual site model for the NVARNG Cheyenne AASF is shown on **Figure ES-2.**



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at AASF Las Vegas Cheyenne			
REVISED	3/12/2020	GIS BY	HO	3/12/2020
SCALE	1:16,800	CHK BY	MW	3/12/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	3/12/2020

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Summary of Findings

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure ES-1

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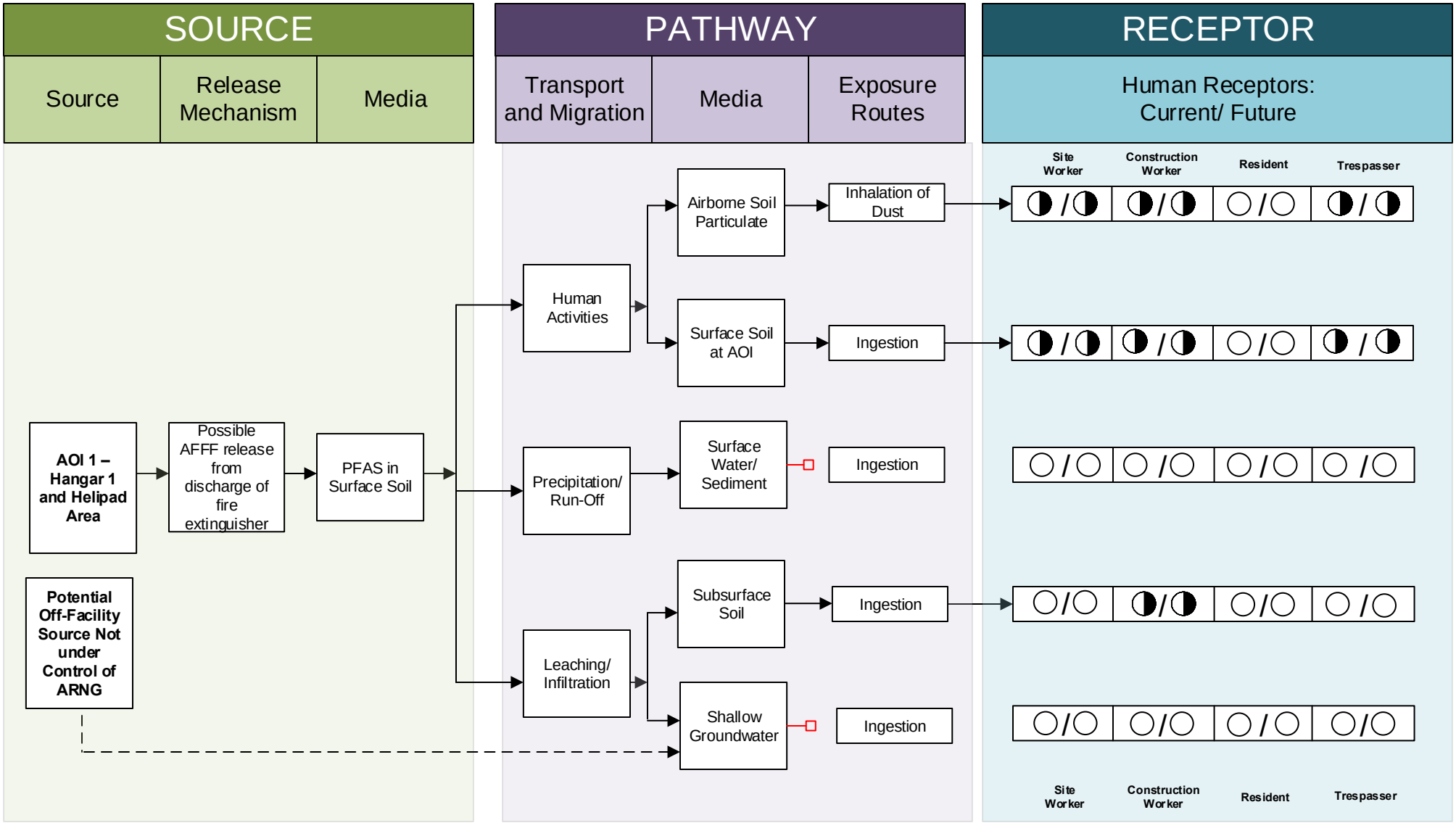

LEGEND

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

Notes:

1. The resident and recreational user receptors refer to an off-site resident and recreational user.
2. Dermal contact exposure pathway is incomplete for PFAS.

Figure ES-2
Preliminary Conceptual Site Model
Cheyenne AASF, Las Vegas, NV

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) at 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 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 as part of firefighting activities, although other PFAS sources 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 regulatory framework at both federal and state levels continues to evolve. The US Environmental Protection Agency (USEPA) issued lifetime Drinking Water Health Advisories (HAs) for PFOA and PFOS in May 2016, but there are currently no promulgated national standards regulating PFAS in drinking water. The HA is 70 parts per trillion for PFOA and PFOS, individually or combined.

This document presents the findings of a PA for PFAS-containing materials at the current Cheyenne Army Aviation Support Facility Las Vegas (AASF; also referred to as the “facility”), Nevada, 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 known fire training areas (FTAs) as well as other locations where PFAS may have been released into the environment at the 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 of AFFF. If a known or suspected discharge of AFFF or other PFAS-containing material has occurred, that location is designated an Area of Interest (AOI).

1.2 Preliminary Assessment Methods

The following tasks were performed as part 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 1-day PA site visit on 20 September 2019 and completed visual site inspections at locations where PFAS-containing materials were suspected of being stored, used, or disposed;

- Interviewed current AASF Nevada ARNG (NVARNG) personnel during the site visit and NVARNG environmental managers and operations staff;
- Identified 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 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 FTAs at the facility identified during the site visit;
- **Section 3 – Non-Fire Training Areas:** describes other locations of suspected PFAS releases at the facility identified during the site visit;
- **Section 4 – Emergency Response Areas:** describes areas of suspected AFFF discharge at the facility, specifically in response to emergency situations;
- **Section 5 – Adjacent Sources:** describes sources of suspected PFAS release adjacent to the facility that are not under the control of ARNG;
- **Section 6 – Preliminary Conceptual Site Model:** describes the pathways of suspected 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

Cheyenne AASF is located in the city of North Las Vegas, about 5 miles northwest of downtown Las Vegas, Nevada. The AASF occupies a small portion of the Cheyenne Air Center that is located on the north edge of the North Las Vegas Airport (**Figure 1-1**). The Cheyenne Air Center is a privately-owned company servicing private air planes, as well as some aviation tour companies. The AASF includes the use of a part of a large building that is divided in two adjoining pieces: Hangar 1 and Hangar 2. Hangar 1 is leased to the Rochelle Aizenberg Revocable Trust and then, starting in 2018, subleased to the NVARNG. Hangar 2 is leased to NVARNG by a private owner per a 2018 agreement (Broadbent & Associates, 2019). The lease agreements can be found in **Appendix A**.

1.5 Facility Environmental Setting

The AASF is located in the southern tip of Nevada at an elevation of approximately 2,205 feet above mean sea level. The facility is covered by the US Geological Survey (USGS) Las Vegas NW 7.5-minute quadrangle topographic map. The facility is developed with two hangars, concrete, and asphalt features.

The facility and city of North Las Vegas is located within the Las Vegas Valley, which is a fault-bounded structural hydrologic basin made of alluvial-fan deposits. The Las Vegas Valley is part of the Mojave Desert and is about 1,600 square miles except for its the northwest portion that consists of foothills or mountain ranges. (Bell, 2016).

1.5.1 Geology

Cheyenne AASF is located in the Basin and Range geomorphic province, where east-west extensional tectonic movement (spreading) has created a large number of north-south oriented block faulted mountain ranges. The area is situated in the southern part of the Las Vegas Valley, which is northwest trending, generally following the right lateral strike-slip character of the Las Vegas shear zone. This fault cuts the thrust system at right angles, offsetting the southern tier of mountains to the west. The Las Vegas Valley itself has been formed by the pulling apart of block faulted ranges by drag effects of displacements along the Las Vegas shear zone (Wyman et al, 1993).

The Las Vegas Valley is a fault-bounded structural and hydrologic basin containing hundreds of feet of late Tertiary and Quaternary lacustrine, paludal, and alluvial deposits. These sediments consist of poorly compressible, coarse-grained alluvial-fan deposits around the valley margins and of highly compressible, fine-grained sediment in the middle of the valley (Bell, 2016). The Las Vegas Valley drains into Lake Mead via the Las Vegas Wash and is part of the overall Colorado River drainage system. A low divide north of Las Vegas separates the main part of the valley from the interior draining basins to the north. The valley lies between the Spring Mountains to the west, which reach an altitude of 12,000 feet, and the much lower Frenchman (4,000 feet) and Sheep Mountains and Las Vegas Ranges (10,000 feet) to the east.

1.5.2 Hydrogeology

The Las Vegas Valley is underlain by coalescing alluvial fans mostly originating on the front of the Spring Mountains and Sheep Range. These fans contain lenticular and irregularly distributed aquifers of permeable sand and gravel, separated by aquitards of silt and clay that are nearly impermeable, created a large artesian ground-water system (Wyman et al, 1993).

The facility is underlain by silt with discrete layers of sand, clay, or gravel. Based on the soil survey published by the US Department of Agriculture (USDA) Soil Conservation Service, the facility encompasses one mapped soil unit, Skyhaven, which is a very fine sandy loam. The facility's hydrologic soil group classification is "Class C, slow infiltration rates, soils with layers impeding downward movement of water or soils with moderately fine or fine textures," (Broadbent & Associates, 2019). The soil drainage classification is "well drained," (Broadbent & Associates, 2019). Depth to groundwater is expected to be approximately 20 feet below ground surface (bgs), based on information from the Nevada Division of Water Resources on-line Well Log Database (Broadbent & Associates, 2019). The groundwater flow direction in the vicinity of the facility is assumed to be toward the southeast (Broadbent & Associates, 2019). Southern Nevada gets roughly 10% of its water supply from groundwater. The Las Vegas Valley Water District pumps

groundwater from wells to meet peak summer demand. During the hot summer months from June through September, groundwater can account for up to 25% of the valley's daily water supplies (Las Vegas Valley Water District [LVVWD], 2019).

Groundwater in the Las Vegas Valley comes from three major primary aquifer zones generally located from 300 to 1,500 feet below land surface. Thick layers of clay and fine-grained sediment separate these primary aquifers from the shallow aquifers, which lie within 50 feet bgs. All groundwater in the Las Vegas Valley comes from the snowmelt and rainfall from mountain ranges surrounding the valley. Most of the wells in the Las Vegas area draw water from the primary principal aquifer system, which is several hundred feet thick. This aquifer system is confined by an aquitard, which is about 200 feet thick (Las Vegas Valley Groundwater Management Program [GMP], 2019).

An EDR™ report conducted a well search for a 1-mile radius surrounding the facility (**Appendix A**). Using additional online resources, such as state and local GIS databases, wells were researched to a 4-mile radius of the facility. No on-site water wells or springs exist on the facility (**Figure 1-2**).

1.5.3 Hydrology

The topography in the area of the AASF is relatively flat, and surface water generally drains towards the southeast. No lakes, ponds, streams, retentions basins, or areas of standing water are located on or immediately adjacent to the facility.

The western edge of the Las Vegas Valley is located approximately 5 miles west of Lake Mead and serves as an impoundment on the Colorado River. Most shallow groundwater and all surface water in the western Las Vegas Valley are tributaries of the Colorado River via the Las Vegas Wash. According to LVVWD, less than 2% of Lake Mead's water come from the Las Vegas Wash, and the remaining water is sourced from snowmelt into the Colorado River. Southern Nevada gets nearly 90% of its water from the Colorado River, which begins as snowmelt in the Rocky Mountains, and ends up in Lake Meade (LVVWD, 2019). Water features near the facility are shown in **Figure 1-3**.

Based on the USEPA Unregulated Contaminant Monitoring Rule 3 (UCMR3) data, it was indicated that no PFAS were detected in a public water system above the HA within 20 miles of the facility. The HA is 70 parts per trillion for PFOA and PFOS, individually or combined. 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.

1.5.4 Current and Future Land Use

Presently, Cheyenne AASF resides in Cheyenne Air Center. The AASF facility includes a portion of a large building (Hangars 1 and 2 including an office area), three helicopter landing pads, and a small paved area. The current land use is listed as M-2 General Industrial. Future land use is not anticipated to change (Broadbent & Associates, 2019).

1.5.5 Climate

The facility lies in a relatively high-altitude portion of the Mojave Desert, with a subtropical hot-desert climate (Skrbac, 2005). Summers display classic desert southwest characteristics with low humidity and daily high temperatures typically exceeding 100 degrees Fahrenheit (ºF) and

lows around 70 ºF. Winters are mostly mild. The Las Vegas region generally receives less than 5 inches of rainfall per year (National Oceanic and Atmospheric Administration [NOAA] 2019).

CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at AASF Las Vegas Cheyenne			
REVISED	12/6/2019	GIS BY	GC	12/6/2019
SCALE	1:63,360	CHK BY	MW	12/6/2019
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	12/6/2019

Facility Location

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Figure 1-1

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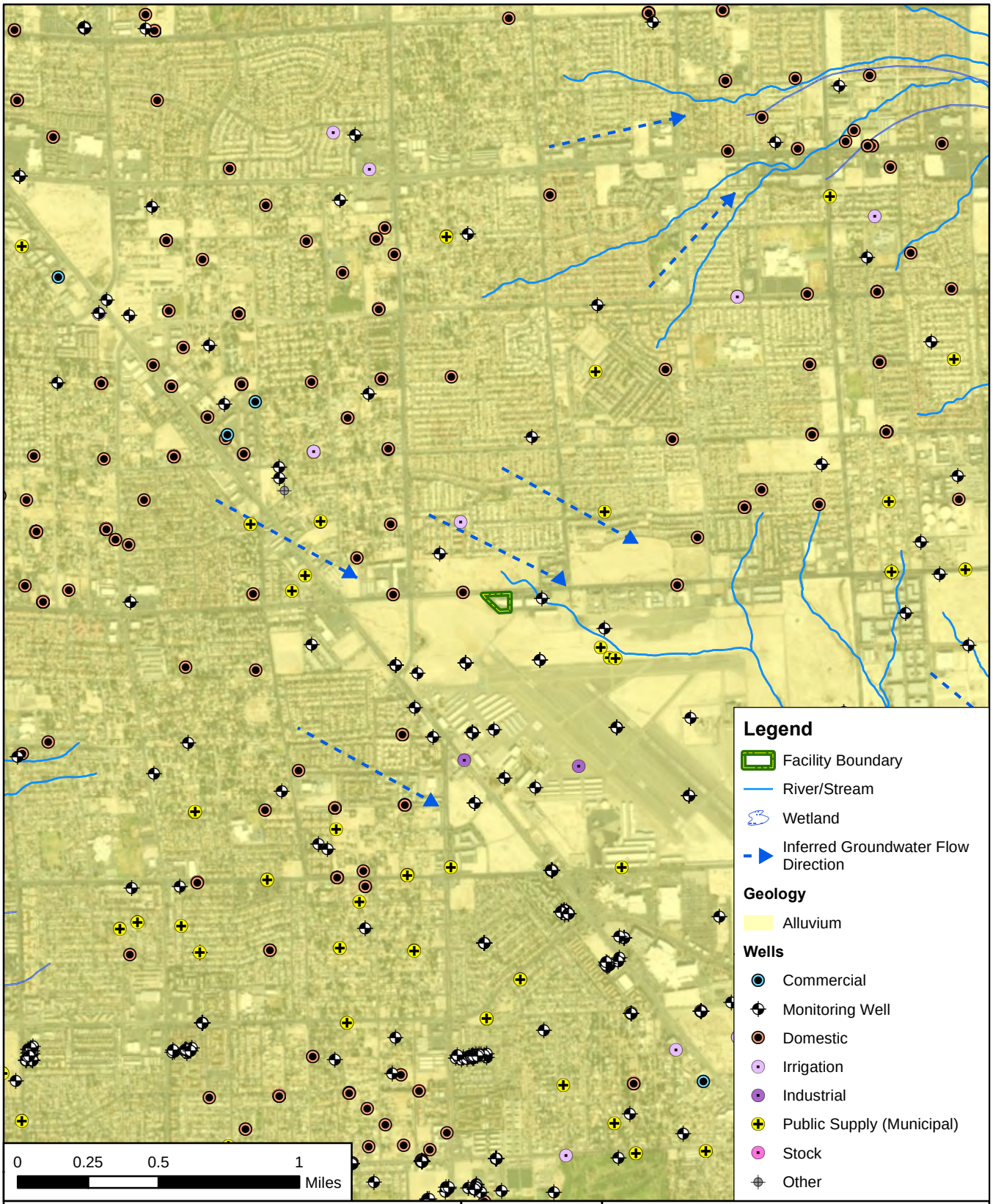

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SCALE	1:31,680	CHK BY	MW	1/22/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	1/22/2020

Groundwater Features

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Figure 1-2

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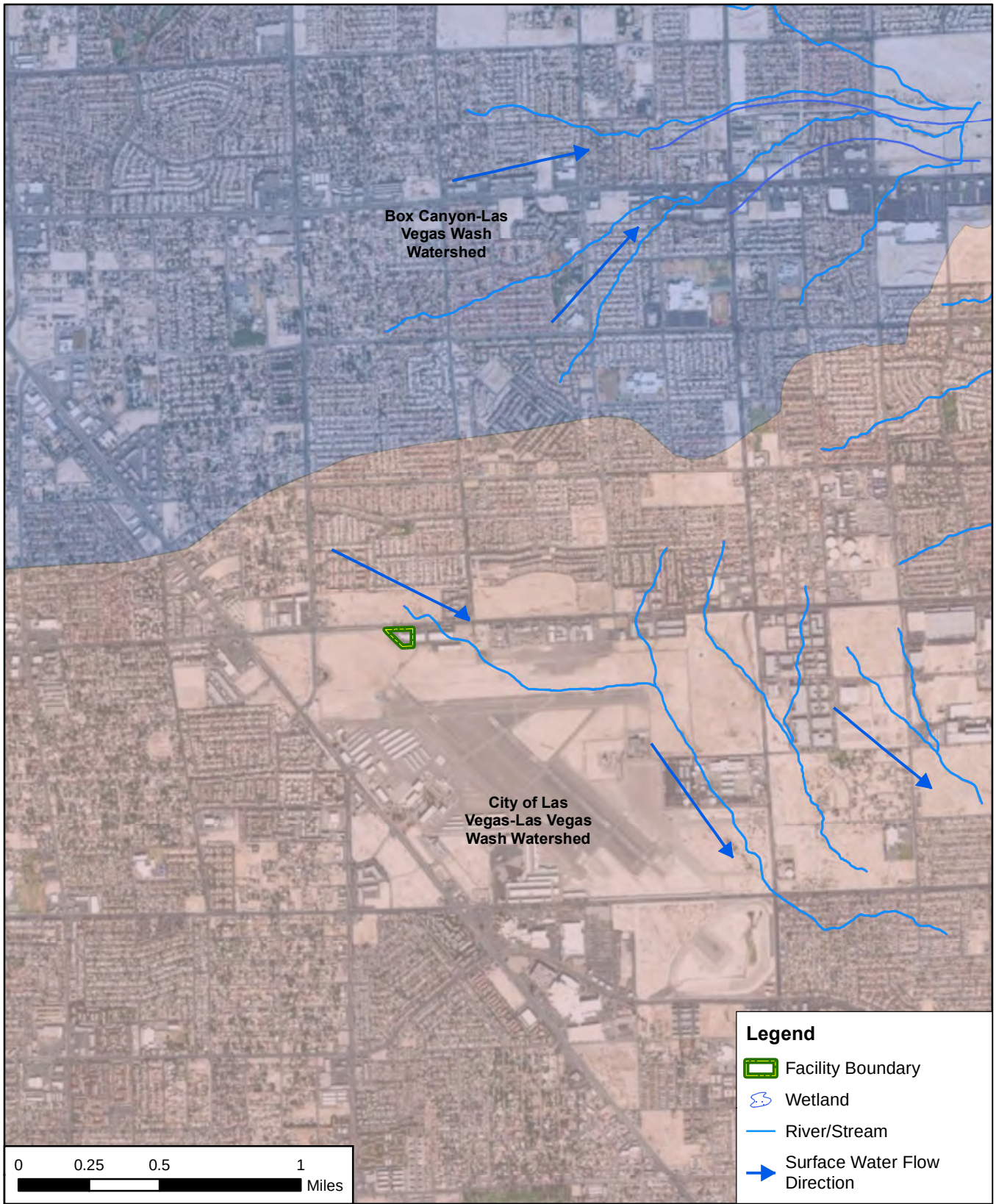

CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at AASF Las Vegas Cheyenne			
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Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	12/6/2019

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Surface Water Features

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Figure 1-3

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2. Fire Training Areas

One possible FTA was identified during the PA. According to interviews conducted with facility personnel whose collective knowledge spans from 2003 to present, and historical research, fire training did not regularly occur on site. In the event of an emergency, 911 is called, and the North Las Vegas Fire Department responds.

Personnel had anecdotal knowledge that a fire extinguisher may have been discharged by a guardsman on the unpaved sandy area at the southwest edge of the asphalt helipads as part of an unofficial training exercise. Interviewees believe that dawn dish soap was likely used if this was the case, but there is no documentation to confirm this (**Figure 2-1**). A specific timeframe for this event was not given; however, personnel indicated it would have been prior to 2003, before any of the interviewees were stationed at this AASF. Because details are not specifically recalled, this training event is considered a potential AFFF release. A polymer coating and drainage swale which runs south underneath the adjacent access road into an empty soil patch was added to this area in 2016 to reduce the spread of dust during helicopter take-off and landings. Interview records appear in **Appendix B**.

CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at AASF Las Vegas Cheyenne			
REVISED	3/12/2020	GIS BY	HO	3/12/2020
SCALE	1:2,400	CHK BY	MW	3/12/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	3/12/2020

Fire Training Areas

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Germantown, MD 20876

Figure 2-1

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3. Non-Fire Training Areas

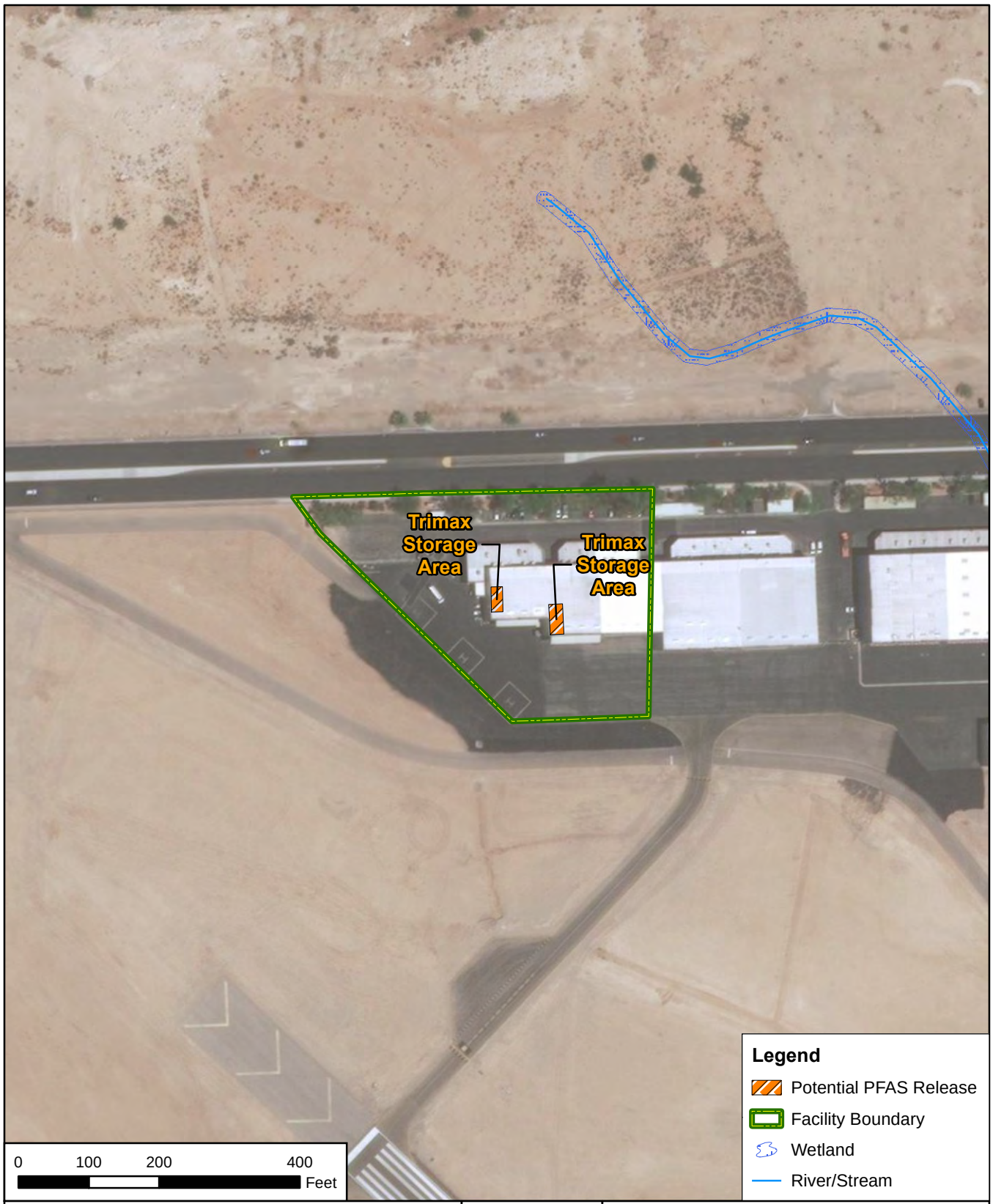
In addition to FTAs, the PA evaluated areas where PFAS-containing materials may have been broadly used, stored, or disposed. This may include buildings with fire suppression systems, paint booths, AFFF storage areas, and areas of compliance demonstrations. Information on these features obtained during the PA are included in **Appendices A** and **B**. One non-FTA where AFFF has previously been or is currently being stored was identified during the PA. A description of the non-FTA is presented below, and the non-FTA is shown on **Figure 3-1**. Interview records with relevant information appear in **Appendix B**, and photographs appear in **Appendix C**.

3.1 Hangar 1

Hangar 1 formerly housed a single Tri-Max™ hand-truck that was stored in various locations around the structure. The two primary storage areas are shown in **Figure 3-1**. This Tri-Max™ unit was on site from the early 2000s until 2016, when it was sent back to the Carson City Warehouse Defense Reutilization and Marketing Office. The unit was regularly serviced by a safety officer in Reno contracted through ABC until sometime between 2008 and 2010. According to interviews, there are no records or recollection of the hand-truck ever being used for fire training or emergency response.

Presently, one fire extinguisher containing AFFF exists on site. The extinguisher is regularly inspected and maintained, and it is in good condition. According to personnel interviews, the unit is stored just outside of Hangar 1, near the helipad area (area not shown in **Figure 3-1**). Photographs of the fire extinguishers at the facility appear in **Appendix C**.

Given the existence of AFFF at the facility, there is a potential for an undocumented release from the former Tri-Max™ unit or existing fire extinguisher.



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Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	3/12/2020

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Non-Fire Training Areas

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Figure 3-1

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4. Emergency Response Areas

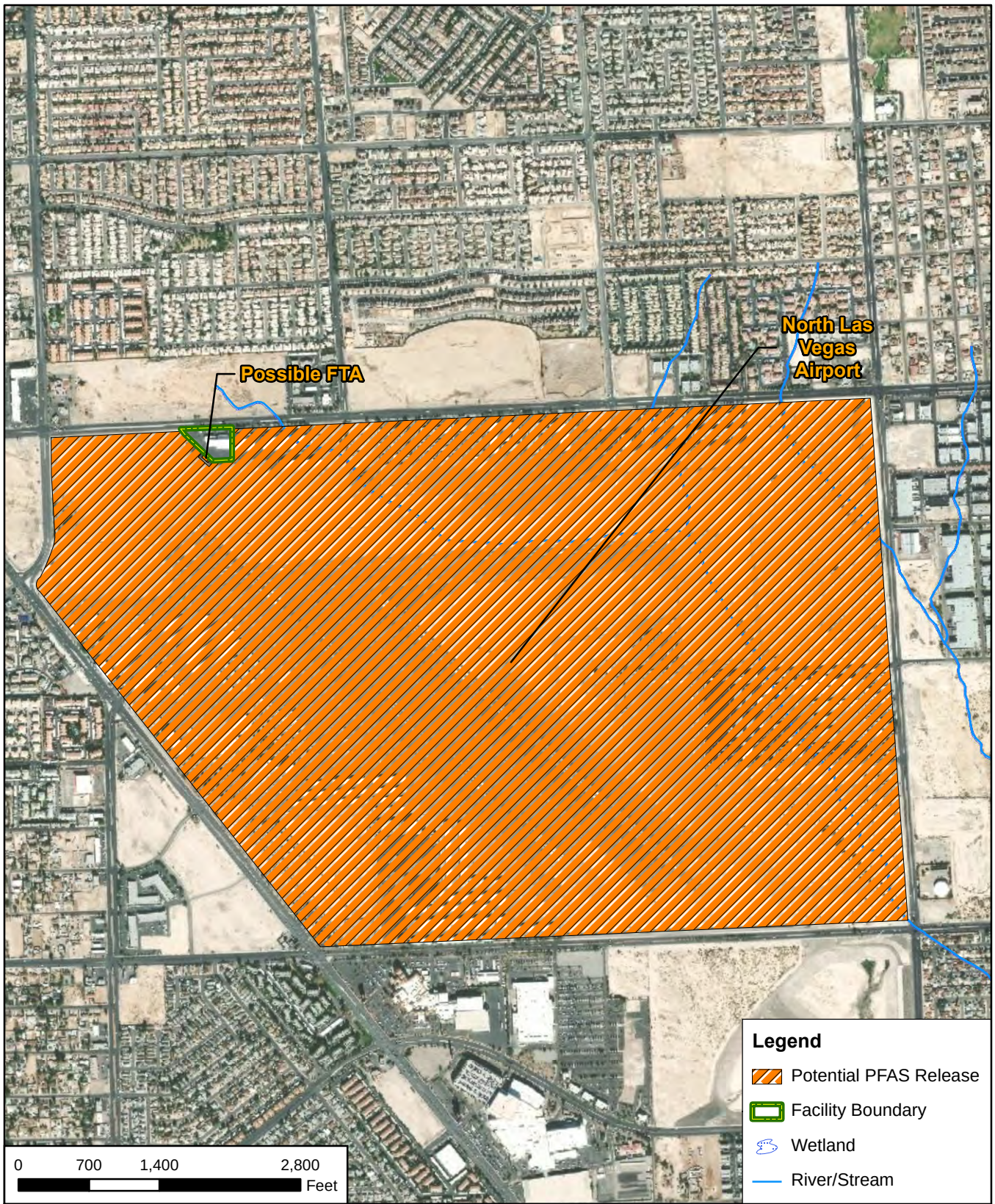
No emergency response areas were identified within the boundaries of the AASF facility during the PA through interviews, previous investigations, online research, and the EDR™ report (**Appendix A**). Personnel Interviewed during the PA site visit stated that no incidents have occurred on site that required fire suppression (**Appendix B**), and the City of North Las Vegas Fire Department provides emergency response to Cheyenne AASF.

5. Adjacent Sources

One off-facility site was identified as a possible PFAS source adjacent to Cheyenne AASF during the PA and is discussed below. **Figure 5-1** presents the location of the suspected adjacent PFAS sources.

5.1 North Las Vegas Airport

The North Las Vegas Airport opened as Sky Haven Airport on 7 December 1941. Ownership changed at Sky Haven several times, including changing the name to North Las Vegas Airport (Clark County Department of Aviation, 2016). Interviews with NVARNG facility staff and a historical records search revealed little information regarding use of AFFF at North Las Vegas Airport. During a records search, it was found that an emergency incident happened on or near the runway on January 02, 2013. According to the National Transportation Safety Board, a twin-engine Piper Aerostar crashed and burst into flames at the airport following a hard landing. It is unknown if AFFF was used as part of the emergency response to the fire (National Transportation Safety Board [NTSB], 2015).



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at AASF Las Vegas Cheyenne			
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Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	3/12/2020

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Adjacent Sources

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Figure 5-1

Q:\Projects\ENV\GEARS\GEO\ARNG PFAS\900-CAD-GIS\920-GIS or Graphics\MXD\NV\CheyenneAASF\Fig5-1_CheyenneAASF_AdjacentSources.mxd

6. Preliminary Conceptual Site Model

Based on the PA findings, one potential release area was identified at Cheyenne AASF or adjacent areas as a result of NVARNG actions and will be considered an AOI. The AOI locations is shown on **Figure 6-1**. A CSM includes three components necessary for potentially complete exposure pathways related to a site: (1) source, (2) pathway, and (3) receptor. If any of these elements are missing, the pathway is considered incomplete.

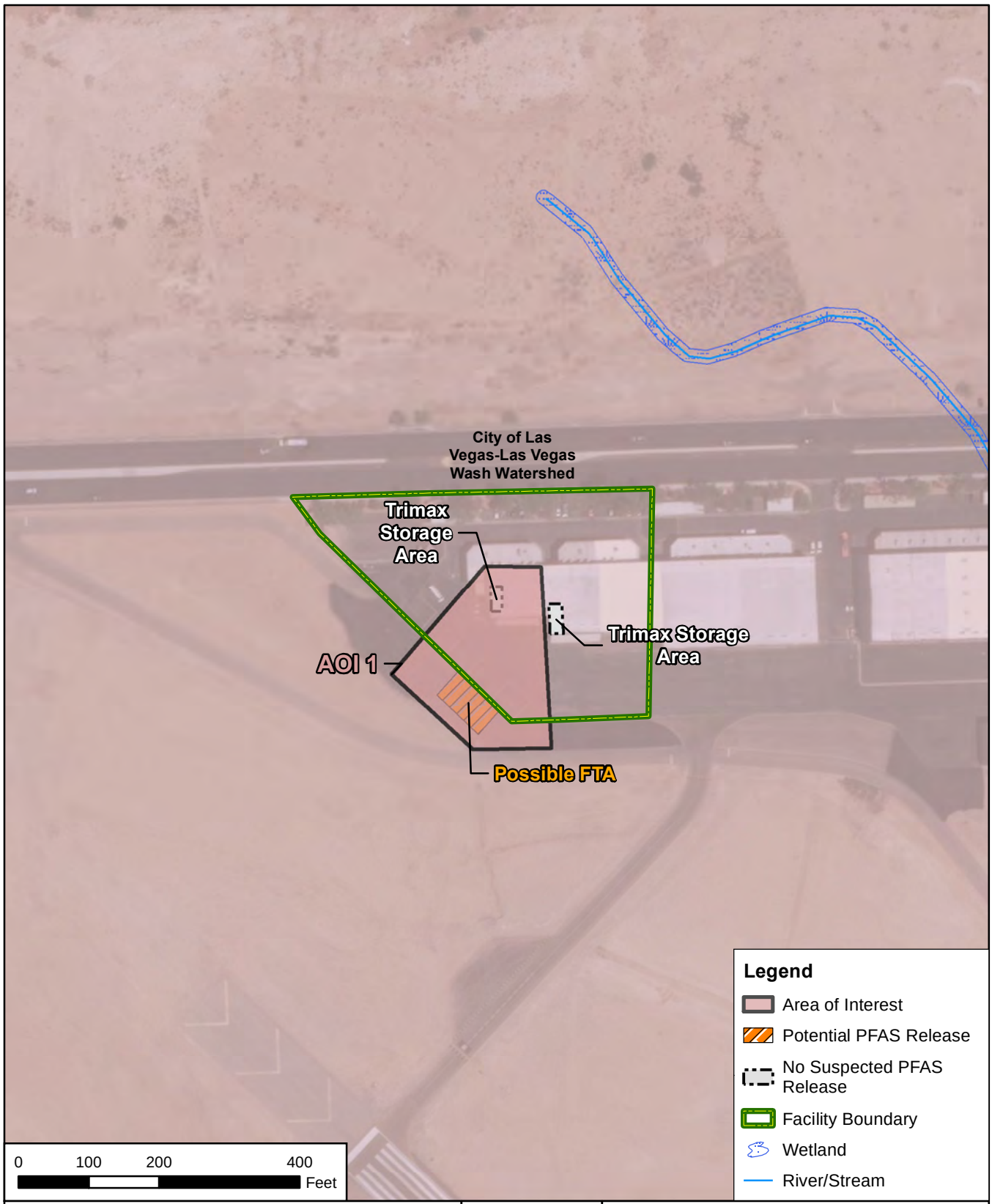
In general, the potential PFAS exposure pathways are ingestion and inhalation. Human exposure via the dermal contact pathway may occur, and current risk practice suggests it is a negligible pathway compared to ingestion; however, exposure data for dermal pathways are sparse and continue to be the subject of PFAS toxicological study. Receptors for Cheyenne AASF include site workers, construction workers, off-site residents, and trespassers. The CSM indicates which specific receptors could potentially be exposed to PFAS.

6.1 AOI 1: Hangar 1 and Helipad Area

AOI 1 encompasses Hangar 1 where a Tri-Max™ hand-truck was stored for approximately 16 years and where a current AFFF fire extinguisher is kept. If AFFF were discharged from either item, residual material could be washed from the hanger and into surrounding soil areas. AOI1 also includes the helipad area where a fire extinguisher possibly containing AFFF may have once been discharged into the adjacent unpaved soil (**Figure 6-1**).

Ground disturbing activities in the area could result in construction worker, site worker, and trespasser exposure to potential PFAS contamination via inhalation of dust or ingestion of surface soil, as well as construction worker to subsurface soil. Accidental ingestion of surface water is not considered a potentially complete pathway for any receptor because surface water is limited to times of rare rainfall events.

PFAS are water soluble and can migrate readily from soil to groundwater. Groundwater beneath the facility is approximately 20 feet bgs. The City of Las Vegas's primary drinking water source is the Colorado River, but Las Vegas supplements about 10% of its supply from groundwater resources in the area obtained from the deeper aquifers protected by an aquitard. It is unlikely that groundwater is a complete exposure pathway. The preliminary CSM for AOI 1 is shown on **Figure 6-2**.



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at AASF Las Vegas Cheyenne			
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Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	3/6/2020

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Areas of Interest

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Germantown, MD 20876

Figure 6-1

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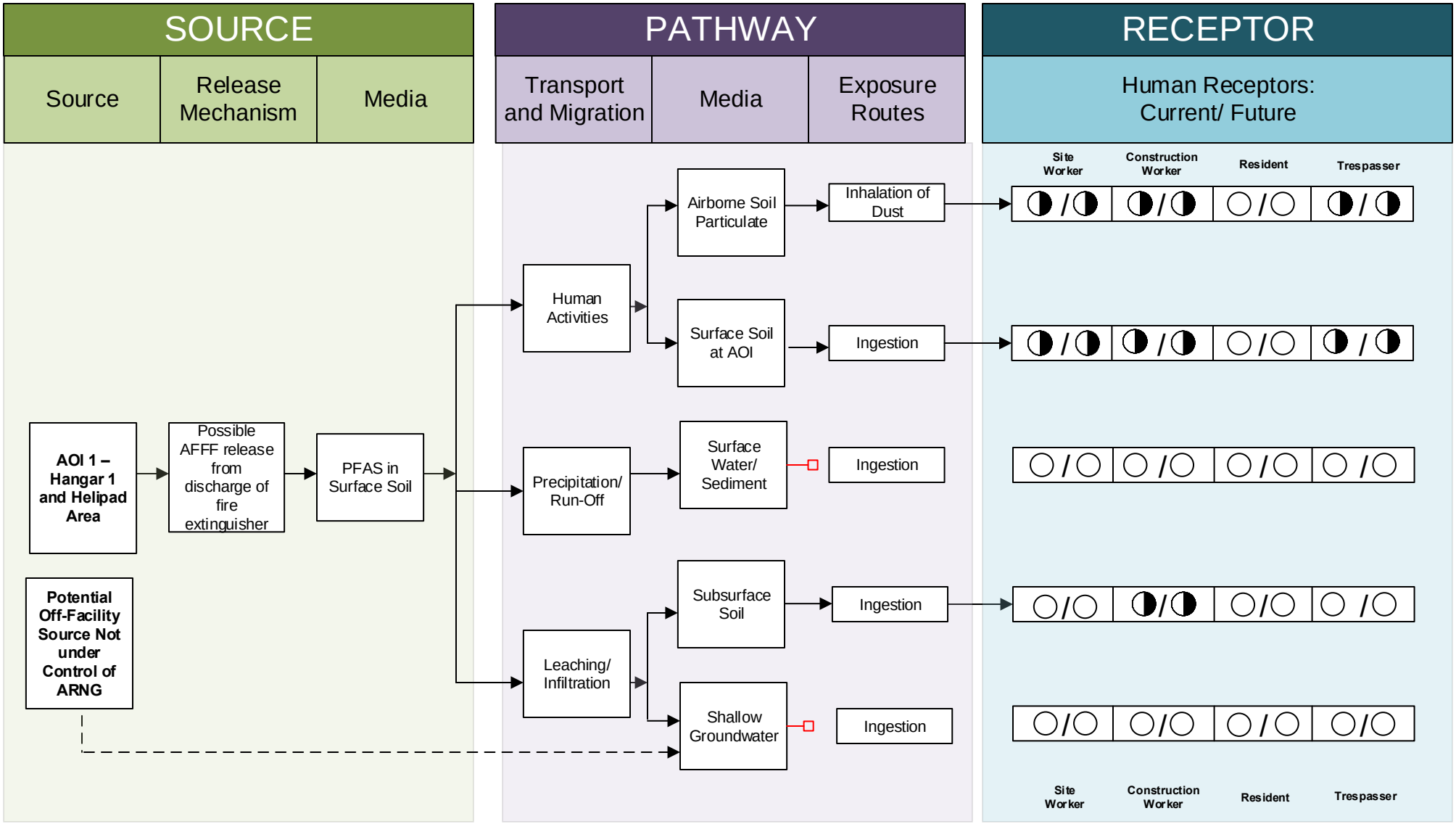


LEGEND

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

Notes:

1. The resident and recreational user receptors refer to an off-site resident and recreational user.
2. Dermal contact exposure pathway is incomplete for PFAS.

Figure 6-2
Preliminary Conceptual Site Model
Cheyenne AASF, Las Vegas, NV

7. Conclusions

This document presents a summary of information on known or suspected management of AFFF at Cheyenne AASF. The PA findings are based on personnel interviews, environmental investigations and reports, historical documents, and the visual site inspection. The PA findings are based on the information presented in **Appendix A**, **Appendix B**, and **Appendix C**.

7.1 Findings

One AOI related to potential PFAS releases discussed in **Section 2** and **Section 3** was identified at the Cheyenne AASF based on PA data (**Figure 7-1**) and is described in **Table 7-1** below:

Table 7-1: Areas of Interest

Area of Interest	Name	Used by	Potential Release Dates
AOI 1	Hangar 1 and Helipad Area	NVARNG	Prior to 2003

Based on potential PFAS releases at the AOI, there is potential for exposure to PFAS contamination in media at or near the facility. The preliminary CSM for Cheyenne AASF is shown on **Figure 6-2**, which presents the potential receptors and media impacted.

An adjacent potential PFAS release area was identified within the vicinity of the NVARNG facility. North Las Vegas Airport had a plane crash on the runway in 2013, though it is unknown whether AFFF were used to respond to these situations.

The summary of findings is presented in **Figure 7-1**.

7.2 Uncertainties

A number of information sources were 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 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, other non-traditional activities, or on its disposition. There is no historically documented use of PFAS containing materials at Cheyenne AASF by NVARNG staff.

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 were first used, and a reliance on personal recollection. Inaccuracies may arise in suspected AFFF discharge locations, discharge dates, discharge volumes, and PFAS concentration. 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.

At Cheyenne AASF, uncertainty lies in whether or not AFFF releases occurred at Hangar 1 or from a fire extinguisher discharged at the edge of the helipad area. In order to minimize the level of uncertainty, readily available data regarding the use and storage of PFAS were reviewed,

current personnel were interviewed from NVARNG, multiple persons were interviewed for the same potential source area, and potential source areas were visually inspected.

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

Table 7-2: Sources of Uncertainties

Area of Interest	Source of Uncertainty
AOI 1 Hangar 1 and Helipad Area	Records of AFFF use and releases were not typically kept, and recollections may be incomplete.

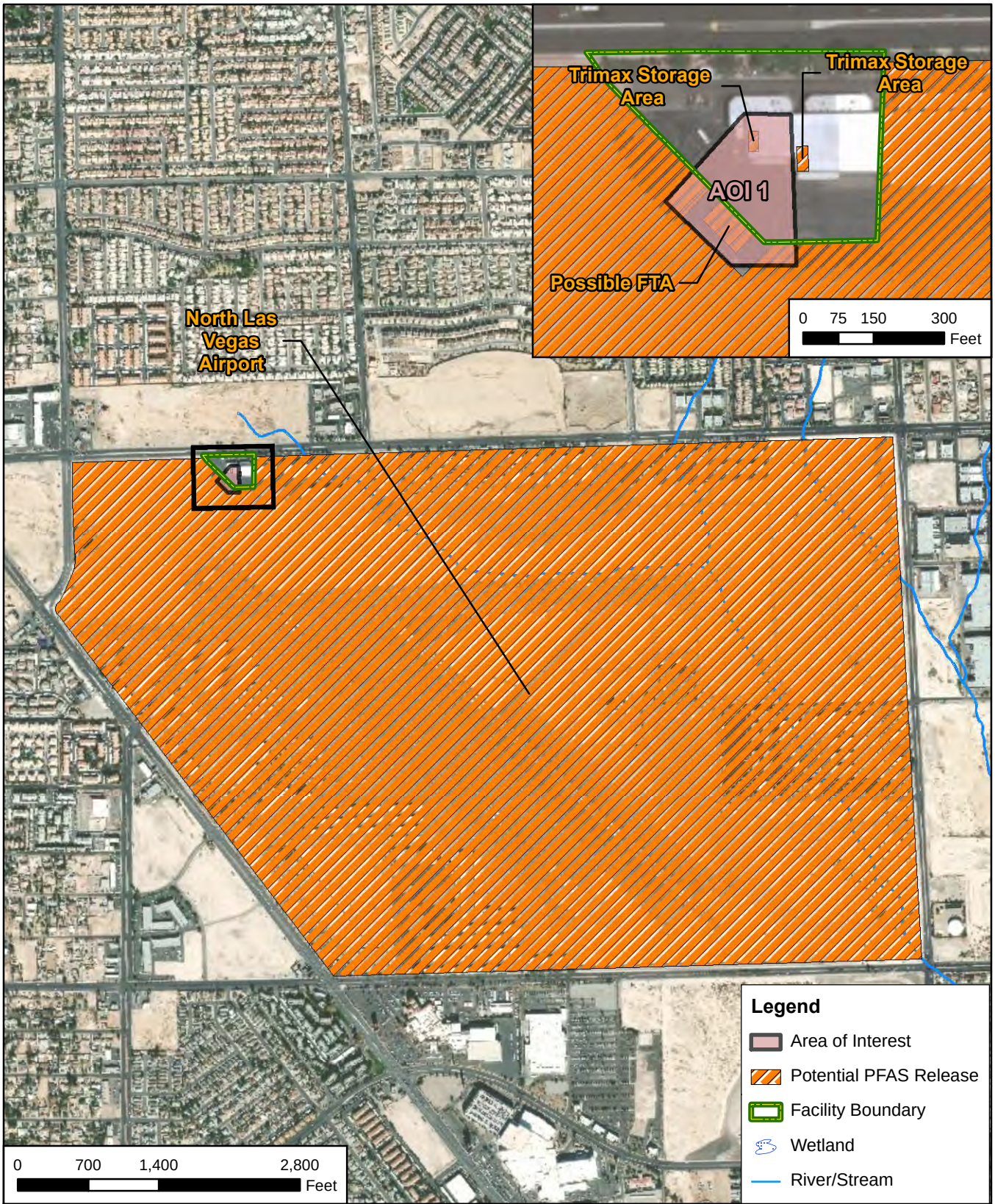
7.3 Potential Future Actions

Interviews with NVARNG facility staff whose first-hand knowledge at Cheyenne AASF span 2003-present indicate that ARNG activities may have resulted in a potential PFAS release at the AOI identified during the PA. Based on the preliminary CSM developed for the AOI, there is potential for trespassers and site and construction workers to be exposed to PFAS contamination in surface and subsurface soil via ingestion and inhalation of dust. **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 Hangar 1 and Helipad Area	36°12'59.07"N; 115°12'07.53"W	Storage of Tri-Max™ and AFFF fire extinguisher; potential discharge of fire extinguisher possibly containing AFFF	Proceed to an SI, focus on soil

ARNG will evaluate the need for an SI at AOI 1 at the NVARNG Cheyenne AASF based on the potential receptors, the potential migration of PFAS contamination off the facility, and the availability of resources.



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at AASF Las Vegas Cheyenne			
REVISED	3/12/2020	GIS BY	HO	3/12/2020
SCALE	1:16,800	CHK BY	MW	3/12/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	3/12/2020

N

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 Cheyenne AASF facility include:

Cheyenne AASF Previous Investigations

- 2019 Broadbent. Phase 1 Environmental Site Assessment. NVARNG Cheyenne Air Center Hangars 1& 2

Cheyenne AASF Facility Information

- 2018 Cheyenne Hangar 1 Lease 5 yr
- 2018 Cheyenne Hangar 2 Lease 5 yr

Cheyenne AASF EDR™ Report

- 2019 Cheyenne AASF Environmental Data Resource Report

Appendix B
Preliminary Assessment Documentation

Appendix B.1
Interview Records

PA Interview Questionnaire - Other

Facility: Cheyenne AASF Las Vegas, NV
Interviewer: [redacted]
Date/Time: 9/20/2019 0900

Interviewee: [redacted] / VARIOUS **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:

CW2 [redacted]
CW3 [redacted] – since 2003
CPT [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?

- 1 Trimex unit hand truck - early 2000's
  - ↳ was never used
  - Stopped refilling in 08-10
    - was refilled by safety officer in Reno contracted through ABC
    - Hand truck went back to RENO 2016
- 2016 - Hangars became a facility
  - previously just ~~two~~ one hangar ~~was used~~ rented by NVARNG
  - facility is now 2 hangars that NVARNG operates out of
    - flies Lakota Helicopters from this location used in search & rescue operations & training.
- New fire extinguishers also PFAS 3%/1.9%

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:_____
Interviewer:_____
Date/Time:_____

- No incidents involving PFAS / AFFF
- NO FD → 911 for emergencies, city FD handles calls.
- No fire suppression system → just water.

- Training happened once on-site. → date?
  - unsure if AFFF was used. → most likely soap.
  - sprayed on dirt on edge of parking apron
    - now ~~use~~ covered w/ polymer coating (rhino shot) ↙2014
      - ↳ used to keep dust down.
- Hangar 1 on corner - 2 most recently added.

Appendix B.2
Visual Site Inspection Checklists

Facility ST
Visual Survey Inspection Log

Recorded by: [redacted]
ARNG Contact:
Date: 9/20/2019

Site Name / Area Name / Unique ID: Cheyenne AASF las Vegas NV
Site / Area Acreage:
Historic Site Use (Brief Description):

Current Site Use (Brief Description):

1. Was AFFF used at the site/area? Y / (N) UNSURE/UNLIKELY
   3a. If yes, document how AFFF was used and usage time (e.g., *fire fighting training 2001 to 2014*)
   FIRE EXTINGUISHER TRAINING ONCE- MAY HAVE JUST BEEN SOAP
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.*) Added a hangar in 2016
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

flat sandy area next to road / Airport. Any runoff from very little rainfall dries or flows towards airport

Appendix B.3
Conceptual Site Model Information

Preliminary Assessment – Conceptual Site Model Information

Site Name: Cheyenne AASF, Las Vegas Nevada

Why has this location been identified as a site?

Trimes (hand) trucks previously stored on-site.

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

No

Training Events

Have any training events with AFFF occurred at this site? Unsure / Unlikely → Training but soap likely used.

If so, how often? Once? <Unsure>

How much material was used? Is it documented? UNKNOWN / NO

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? SE

Average rainfall? < 5 inch year

Any flooding during rainy season? during monsoon season but not this area

Direct or indirect pathway to ditches? small divet next to parking apron

Direct or indirect pathway to larger bodies of water? NO

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? Unsure

Preliminary Assessment – Conceptual Site Model Information

Groundwater:

Groundwater flow direction? SE

Depth to groundwater? ~ 20 ft

Uses (agricultural, drinking water, irrigation)? irrigation

Any groundwater treatment systems? yes

Any groundwater monitoring well locations near the site? yes

Is groundwater used for drinking water? ~ 10%

Are there drinking water supply wells on installation? No

Do they serve off-post populations? No

Are there off-post drinking water wells downgradient NO

Waste Water Treatment Plant:

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

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?

N/A

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?

NO / N/A

3. Other?

Preliminary Assessment – Conceptual Site Model Information

Identify Potential Receptors:

Site Worker N/A

Construction Worker N/A

Recreational User N/A

Residential N/A

Child N/A

Ecological N/A

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

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	Cheyenne Army Aviation Support Facility	Las Vegas, Nevada

Photograph No. 1

Description:

Facing West. Former Trimex storage area

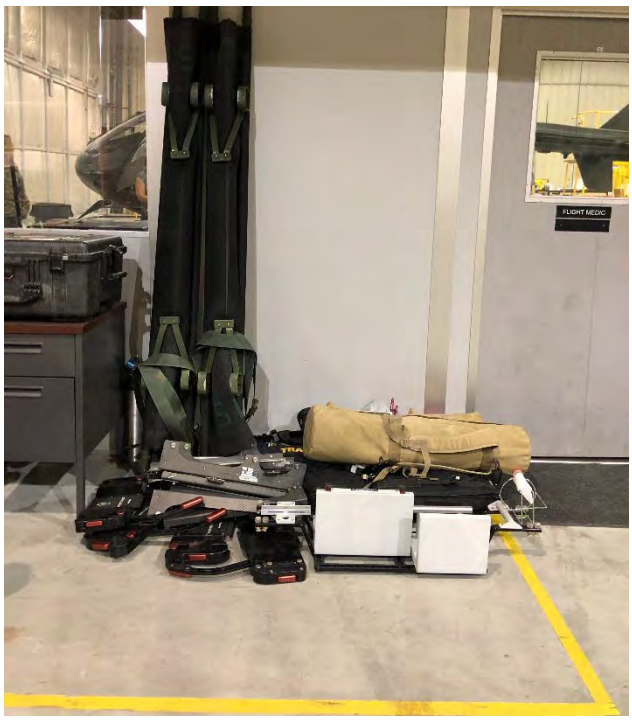
Photo Date: 09/20/2019 0914

Photograph No. 2

Description:

Facing West. Former Trimex storage area

Photo Date: 09/20/2019 0915



APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Cheyenne Army Aviation Support Facility	Las Vegas, Nevada

Photograph No. 3

Description:

Facing East. Water sprinkler system.

Photo Date: 09/20/2019 0916

Photograph No. 4

Description:

Facing North. New fire extinguisher which also contains AFFF.

Photo Date: 09/20/2019 0922

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Army Aviation Support Facility Reno	Reno, Nevada

Photograph No. 5

Description:

Facing West. Area where FTA possibly occurred. Polymer coating applied in 2016

Photo Date: 09/20/2019 0919