APPENDIX D

Green River Sub Installation Preliminary Assessment

Final Abbreviated Preliminary Assessment of Per- and Polyfluoroalkyl Substances

White Sands Missile Range Sub-Installation
Green River Test Site, Utah

Prepared For:
U.S. Army Corps of Engineers, Baltimore District
2 Hopkins Plaza
Baltimore, MD 21201

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Garett Ferguson, PG
Site Inspection Project Manager

Rhonda Stone, PMP
Project Manager

Sarah Alder-Schaller
Technical Lead

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Prepared by:

Arcadis U.S., Inc.

7550 Teague Road

Suite 210

Hanover

Maryland 21076

Our Ref.:

30001995

Date:

July 2023

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1 INTRODUCTION

The United States (U.S.) Army (Army) is performing preliminary assessments (PAs) and site inspections (SIs) on the current or potential historical use of per- and polyfluoroalkyl substances (PFAS) with a focus on perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and perfluorobutanesulfonic acid (PFBS), at Army installations (installations) nationwide. The Army is the lead agency under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and Executive Order 12580 and is conducting PA/SIs consistent with its authority under CERCLA, 42 United States Code §§ 9600, et seq. (as amended), and the Defense Environmental Restoration Program, 10 United States Code §§ 2701, et seq. This abbreviated PA was conducted as part of the PA/SI for White Sands Missile Range (WSMR). The purpose of this abbreviated PA is to identify areas of potential interest (AOPIs) at Green River Test Site (GRTS) based on the use, storage, and/or disposal of PFAS-containing materials, in accordance with the 2018 Army Guidance for Addressing Releases of Per-and Polyfluoroalkyl Substances (Army 2018). This report was also completed in accordance with CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan.

PFAS are a class of compounds that have been used in a wide range of industrial applications and commercial products due to their unique surface tension/leveling properties. Due to industry and regulatory concerns about the potential health effects and adverse environmental impacts, there has been a reduction in the manufacture and use of PFAS worldwide. In the U.S., significant reductions in the production, importation, and use of PFOS and PFOA (two individual compounds in the PFAS class) occurred between 2001 and 2015 (Interstate Technology Regulatory Council 2017). PFBS replaced PFOS in some applications and is currently used and manufactured in the U.S.

In 2016, the United States Environmental Protection Agency (USEPA) established a lifetime health advisory of 70 nanograms per liter (ng/L) in drinking water for PFOS or PFOA and for the sum of PFOS and PFOA when both are present (USEPA 2016). On 15 October 2019, the OSD provided guidance on the investigation of PFOS, PFOA, and PFBS at Department of Defense (DoD) restoration sites (OSD 2019). The DoD guidance provides risk screening levels for PFOS, PFOA, and PFBS in groundwater (tap water) or soil, calculated using the USEPA's Regional Screening Level (RSL) calculator for residential and industrial/commercial worker receptor scenarios. Following the issuance of the 2019 OSD memo, on 08 April 2021, USEPA published an updated toxicity assessment for PFBS (USEPA 2021). Based on the updated toxicity assessment for PFBS, the OSD issued a memorandum on 15 September 2021 to include updated PFBS risk screening levels (OSD 2021).

This abbreviated PA will use readily available information to evaluate and document areas where PFAS-containing materials were used, stored, and/or disposed, so the Army can distinguish

between sites that pose little or no threat to human health and the environment and sites that require further investigation.

2 INSTALLATION OVERVIEW

Green River Test Site (GRTS) is the sub-installation managed as part of U.S. Army Garrison White Sands Missile Range. The location of GRTS is shown on **Figure 1**.

GRTS is located 150 miles southeast of Salt Lake City, Utah on 3,500 acres of land. GRTS is a Cold War-era missile launch test facility with 46 structures proposed for demolition. These structures are in poor condition and are not in use, including partially or fully collapsed buildings and concrete pads (WSMR 2014). In 1961, GRTS was acquired by the government to provide support for the Advanced Ballistic Re-Entry System and the Air Force Systems Command. Athena and Pershing 1A missiles were tested here (Chemical Systems Lab 1982). This testing primarily occurred between 1962 and 1975. The sub-installation became inactive in 1979. GRTS is also referred to as the Utah Launch Complex, Green River Test Complex, and the Green River Launch Facility. Since 1979, very little military activity has occurred here (WSMR 2014).

GRTS exists on the northwest portion of the Paradox Fold Belt of the Colorado Plateau Physiographic Province. It is on the north-plunging nose of a shallow anticlinal fold whose axis approximately coincides with the course of the Green River. The nose is repeated by an arcuate east-west-trending fault which is located 2.5 miles south of the site. Crystal Geyser, a naturally occurring carbon dioxide spring, exists where the Green River crosses this fault (MEVATEC Corporation 2000).

The northwest portion of the sub-installation is on an upper abandoned terrace and the current flood plain of the Green River and its local tributary, Browns Wash. The recent unconsolidated deposits consist of silt, clay, and sand, which are blended with gravels, minor boulders, and cobbles. Thicknesses of these unconsolidated deposits range between 10 and 13 feet. In the westernmost area of the GRTS, alluvial terraces of the Green River exist (MEVATEC Corporation 2000).

3 SUMMARY OF PA ACTIVITIES

First, an installation kickoff teleconference for WSMR and its sub-installation (GRTS) was held between applicable points of contact (POCs) from USAEC, USACE, WSMR, and Arcadis. The kickoff call occurred on 05 September 2018, 6 weeks before the WSMR site visit to discuss the goals and scope of the PAs, project scheduling, installation access, timeline for the site visit, access to installation-specific databases, and to request available records.

A read-ahead package was prepared and submitted to the appropriate POCs two weeks before the WSMR PA site visit. The read-ahead package contains the following information:

- The Installation Management Command (IMCOM) operation order
- The Army PA Operations Security requirements package, which includes the antiterrorism/operations security review cover sheet
- The PFAS PA kickoff call minutes
- An information paper on the PA portion of the Army's PFAS PA/SI
- Contact information for key POCs
- A list of the data sources requested and reviewed
- A list of preliminary locations identified to be evaluated for use, storage, and/or disposal of PFAS-containing materials, where additional information on those areas will be collected through personnel interviews, and additional document review.
- A list of roles for the installation POC to consider when recommending potential interviewees.

The WSMR site visit was conducted on 23 to 26 October 2018. An in-brief meeting was held to provide installation staff with the objectives for the site visit and team introductions. Personnel interviews were conducted with individuals having historical knowledge of GRTS. However, as the sub-installation has been inactive since 1979, there were no potential interviewees identified who had living memory of the site while operational. Therefore, interviews focused on collecting historical documents and general site knowledge.

The records reviewed for this abbreviated PA included, but were not limited to, various Installation Restoration Program (IRP) administrative record documents, compliance documents, and GRTS directorate of public works (DPW) documents. Internet searches were also conducted to identify publicly available and other relevant information. A list of the specific documents reviewed for GRTS is provided in **Table 1**. Site reconnaissance was not performed at GRTS.

An exit briefing was offered to installation personnel at the conclusion of the WSMR site visit to raise any items identified during the site visit, discuss any follow-up items, review the schedule for submitting deliverables, and discuss preliminary findings of the PA site visit. The exit briefing was conducted on 26 October 2018 with WSMR, USAEC, and USACE.

The information regarding GRTS that was collected during the WSMR PA site visit was reviewed and included in the WSMR site visit trip report. This site visit trip report was provided to WSMR POC, applicable USAEC POCs, and USACE regional POCs.

Preliminary locations of potential use, storage, and/or disposal of PFAS-containing materials were then evaluated in the abbreviated PA and were categorized as AOPIs or as areas not retained for further investigation at this time based on a combination of information collected. Further discussion regarding rationale for not retaining areas for further investigation is presented in **Section 5**.

4 POTENTIAL PFAS USE, STORAGE, AND DISPOSAL AREAS

GRTS was evaluated for all potential current and historical use, storage, and/or disposal of PFAS-containing materials. There are a variety of PFAS-containing materials used in relation to current and historical Army operations. However, the use, storage, and/or disposal of AFFF is the most prevalent potential source of PFAS chemicals at DoD facilities.

AFFF was developed in the mid-1960s in response to a need for firefighting foams better suited to extinguish Class B, fuel-based fires. Army installations widely possessed AFFF beginning in the early 1970s. AFFF formulations consist of water, an organic solvent, up to 5 percent (%) hydrocarbon surfactants, and 1 to 3% PFAS (Interstate Technology Regulatory Council 2020). AFFF concentrate is designed to be diluted with water to become a 1, 3, or 6% foam. AFFF releases at DoD facilities may have occurred during firefighter training, emergency response actions, equipment testing, or accidental releases. The military still primarily uses AFFF for Class B fires; however, the current formulations of AFFF contain significantly lower amounts of PFOS, PFOA, and their precursors, and significant operational changes have been implemented to restrict uncontrolled releases and non-essential use of PFAS-containing foams.

The September 2018 Army guidance indicates the mechanisms for potential use, storage, and disposal of PFAS include AFFF, metal plating facilities, wastewater treatment plants (and associated biosolids), and landfills (Army 2018). Two areas potentially associated with AFFF were identified. No metal plating facilities, wastewater treatment plants or landfills associated with AFFF or metal plating were identified. Other potential PFAS sources were also considered. These potential sources include automobile maintenance shops and photo-processing facilities. One building associated with automobile maintenance and photo processing was identified. No other source types were identified.

GRTS featured one fire station (Building 550001) and one fire training area. The fire station was active between 1963 and 1968 but was sparsely utilized near the end of its operational period. The fire training pit was reportedly used for firefighter training activities involving the burning of waste oils within a concrete-lined pit. The concrete was removed in 1968. The location of this training area is estimated to be within the cantonment area. However, the specific location is unknown (MEVATEC Corporation 2000). The period of fire station and fire training activity (1963-1968) predates the beginning of typical AFFF use at Army installations.

GRTS also featured a Photographic Laboratory and Sheet Metal Welding Shop. The Photographic Laboratory/Sheet Metal Welding Shop had two sub-grade automotive service bays. One of these bays was equipped with an unused grease pit. No photographic wastes were reportedly discharged, nor were there signs of leaks or spills.metal shop, where metal plating activities were suspected. It had two automotive service bays. No metal plating wastes were reportedly discharged from this building, nor were there signs of leaks or spills noted in historical documents.

GRTS also featured a metal shop, which was suspecthad two automotive service bays. The Photographic Laboratory/Sheet Metal Welding Shop had two sub-grade automotive service bays. One of these bays was equipped with an unused grease pit. No photographic wastes were reportedly discharged, nor were there signs of leaks or spills.

An exhaustive search to identify all potential off-post PFAS sources (i.e., not related to operations at GRTS) is not part of the PA. However, potential off-post PFAS sources within a 5-mile radius of the installation that were identified during the records search and site visit are described below.

Approximately 5 miles west of GRTS is the Green River Municipal Airport. Airports could potentially be off-post PFOS/PFOA/PFBS sources. No information regarding the use, storage, or disposal of AFFF at this airport was collected as part of this PA.

5 SUMMARY OF AREAS RESEARCHED

Through the evaluation of information obtained during records review and personnel interviews, no AOPIs were identified. A brief site history and rationale for areas not retained for further investigation is presented in **Table 2**, below.

Table 2. Sub-Installation Areas Not Retained for Further Investigation

Area Description	Dates of Operation	Relevant Site History	Rationale
Former Fire Training Pit IRP Site: GRTS-10	1963 – 1968	The Former Fire Training Pit was a concrete-lined pit used for firefighter training located somewhere within the cantonment area. During training exercises, waste oils were burned in this pit. The pit was removed in 1968, but the disposition of the debris removed is unknown. The dimensions and exact location of this pit is unknown.	Activity timeline predates the use of AFFF on military installations. No evidence of PFAS-containing materials used, stored, or disposed at this location.
GRTS Fire Station Building: 550001	1963 – 1968	The GRTS Fire Station was used between 1963 and 1968. According to interviews with WSMR personnel, the GRTS Fire Station was sparsely used near the end of its operational period. During this time, municipal fire departments began covering the sub-installation.	Activity timeline predates the use of AFFF on military installations. No evidence of PFAS-containing materials used, stored, or disposed at this location.

Area Description	Dates of Operation	Relevant Site History	Rationale
Photographic Laboratory / Sheet Metal / Welding Shop Building: S-50022 IRP Site: GTRS-19	1960s – 1970s	The Photographic Laboratory/Sheet Metal Welding Shop had two sub-grade automotive service bays. One of these bays was equipped with an unused grease pit. No photographic wastes were reportedly discharged, nor were there signs of leaks or spills.	No evidence of PFAS-containing materials used, stored, or disposed at this location.

6 CONCLUSIONS

The Abbreviated PFAS PA at GRTS evaluated preliminary locations for the use, storage, and/or disposal of PFAS-containing materials, in accordance with the 2018 Army Guidance for Addressing Releases of Per-and Polyfluoroalkyl Substances (Army 2018). A combination of document review, internet searches and interviews with WSMR personnel were used to identify preliminary locations of suspected use, storage, and/or disposal of PFAS-containing materials at GRTS. Following the evaluation, no AOPIs were identified. Therefore, further investigation for PFAS at GRTS is not warranted at this time.

Data collected during the PA (**Sections 3** through **5**) were sufficient to draw conclusions and recommendations summarized above. The data limitations relevant to the development of this PA at GRTS are discussed below.

Records gathered during the WSMR PA regarding GRTS history, geology, and general activities were limited. Additionally, as the sub-installation has been inactive since 1979, there were no potential interviewees identified who had living memory of the site while operational.

Readily identifiable potential off-post PFAS sources are documented in this PA, if applicable; however, an exhaustive search to identify all potential off-post PFAS sources is not part of this PA. The search is limited to areas that were identified during relevant document research, and WSMR personnel interviews.

7 REFERENCES

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TABLES

Table 1 - List of Documents Reviewed for White Sands Missile Range Sub-Installation Green River Test Site
USAEC PFAS Abbreviated Preliminary Assessment
White Sands Missile Range, NM

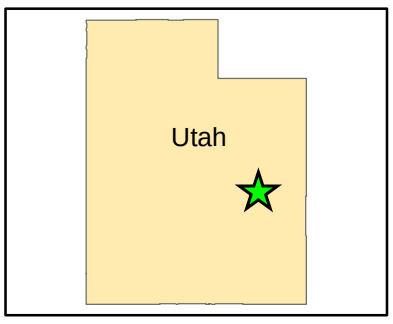
Document Location	Sub Installation	Document Date	Document Name	Author	Description of Information
WSMR Record Files	Green River Test Site, Utah	11/1/1982	Installation Assessment of Green River Rest Site	Chemical Systems Laboratory	Discusses the potential for offpost contaminant migrations via surface and subsurface routes. It is low. Details disposal operations.
WSMR Record Files	Green River Test Site, Utah	12/19/1997	Preliminary Sampling of Green River Test Site	Mevatec Corporation	Discusses previous sampling for areas at GRTS that are not considered AOPIs.
WSMR Record Files	Green River Test Site, Utah	6/1/2000	Preliminary Assessment Narrative Report	Mevatec Corporation	Provides geographic setting, a site description, historic figures of the fire station and photo lab, a background on the infrastructure on site, regional hydrology, and climate.
WSMR Record Files	Green River Test Site, Utah	7/1/1988	Remedial Action at Green River Uranium Mill	United States Department of Energy	Discusses uranium mill tailings site background
WSMR Record Files	Green River Test Site, Utah	9/12/1973	Environmental Assessment Statement for Pershing Artillary	White Sands Missile Range	Describes the use of Pershing missiles on site.
WSMR Record Files	Green River Test Site, Utah	8/1/2014	Environmental Assessment Facility Demolition	White Sands Missile Range	Provides background geological information, water resources, and photos of facilities proposed for demolition, including the Fire Station. It also provides a list of building numbers and their historic functions.

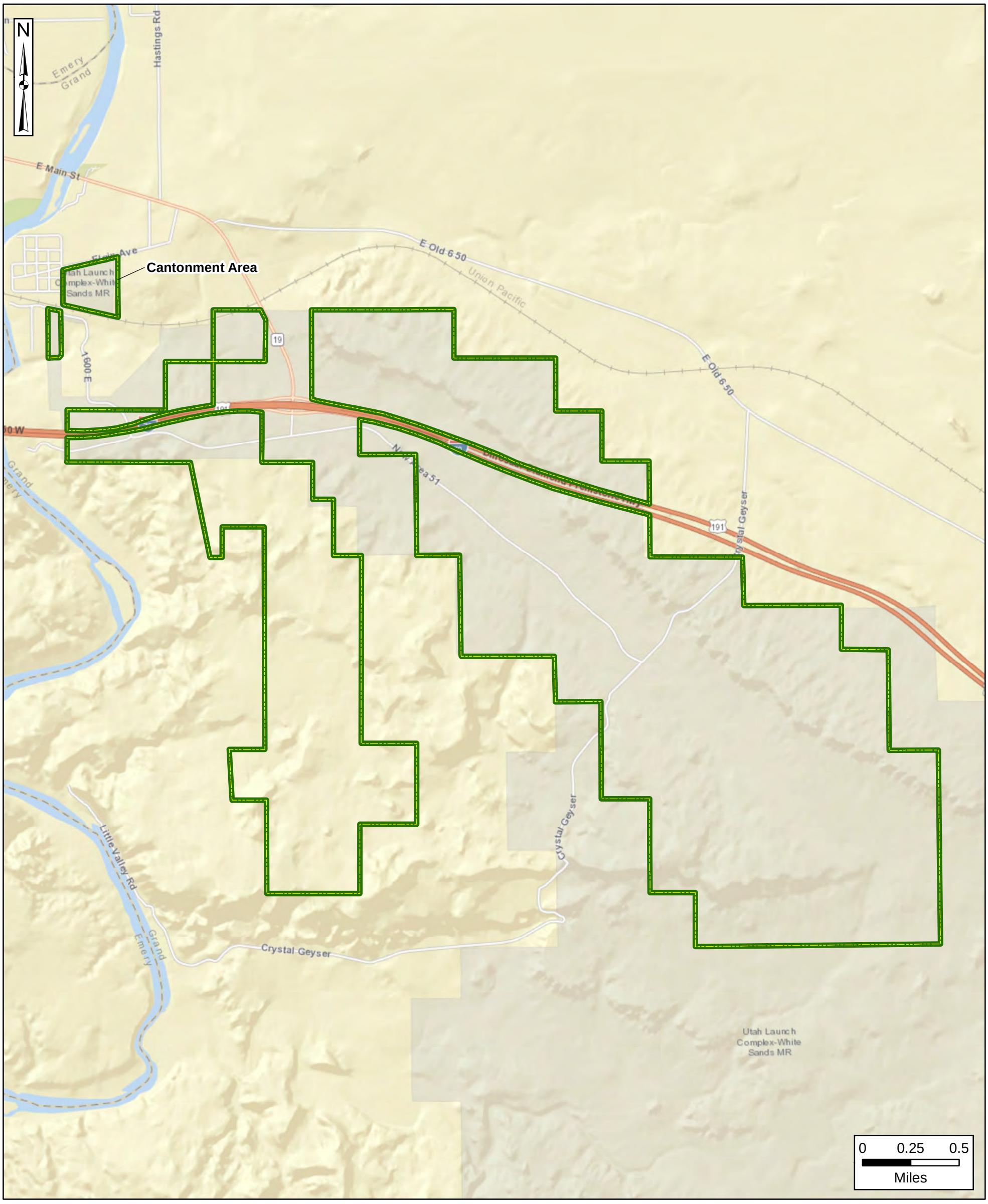
Acronyms:
AOPI - Area of Potential Interest
GRTS - Green River Test Site
WSMR - White Sands Missile Range

FIGURES

USAEC PFAS Abbreviated
Preliminary Assessment
White Sands Missile Range, NM

Figure 1
Site Location Map for
Green River Test Site





Green River Test Site Installation Boundary

Data Sources:
ESRI ArcGIS Online, StreetMap Data

Coordinate System:
WGS 1984, UTM Zone 12 North

Arcadis U.S., Inc.

7550 Teague Road

Suite 210

Hanover, Maryland 21076

Tel 410 987 0032

Fax 410 987 4392

www.arcadis.com