



**STATEMENT OF BASIS
PAYLOAD HAZARDOUS SERVICING FACILITY, SWMU 094
(FORMERLY PRL 116)**

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA**



PURPOSE OF STATEMENT OF BASIS

This Statement of Basis (SB) has been developed to inform and give the public an opportunity to comment on a proposed remedy to address contamination at the Payload Hazardous Servicing Facility¹ (PHSF). A Kennedy Space Center (KSC) Remediation Team consisting of National Aeronautics and Space Administration (NASA) and Florida Department of Environmental Protection (FDEP) personnel has determined that the proposed remedy is cost effective and protective of human health and the environment. However, prior to implementation of the proposed remedy, the KSC Remediation Team would like to give an opportunity for the public to comment on the proposed remedy. At any time during the public comment period, the public may comment as explained in the "How Do You Participate" section of this SB. After the end of the public comment period, the KSC Remediation Team will review all comments and issues raised in the comments and determine if there is a need to modify the proposed remedy prior to implementation.

WHY IS A REMEDY NEEDED?

The results of the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) indicated that ammonia (listed in Table 1) is present in groundwater

at levels that could be potentially harmful to human health if this water was used for human consumption now or in the future.

HOW DO YOU PARTICIPATE?

The KSC Remediation Team solicits public review and comment on this SB before implementing the proposed remedy. The remedy for the PHSF will eventually be incorporated into the Hazardous and Solid Waste Amendments (HSWA) Permit for KSC. The public comment period for this SB and proposed remedy will begin on the date of publication for notice of availability of the SB in major local newspapers of general circulation and

end 45 days thereafter. If requested during the comment period, the KSC Remediation Team will hold a public meeting to respond to any oral comments or questions regarding the proposed remedy. To request a hearing or

The Cleanup Remedy

The proposed cleanup remedy for the PHSF includes the following components:

- Natural Attenuation of groundwater to remove contaminants through natural processes.
- Monitoring of groundwater to document water quality and contaminant levels.
- Implementation of institutional controls to prohibit the use of groundwater as a potable water supply.

provide comments, contact the following person in writing within the 45-day comment period:

¹ In accordance with RCRA §7004(b), this Statement of Basis summarizes the proposed remedy for the NASA PHSF Site. For detailed information on the site, consult the PHSF Site RFI Report, which is available for review at the information repository located at the Merritt Island Public Library, 1195 North Courtenay Parkway, Merritt Island, FL 32953, telephone: (321) 455-1369.

Mr. John R. Armstrong, P.G.
FDEP - Bureau of Waste Cleanup
2600 Blair Stone Road, MS 4535
Tallahassee, FL 32399-2400
Email: John.Armstrong@dep.state.fl.us
Telephone: (850) 245-8981
Fax: (850) 245-8976

The HSWA Permit, SB, and associated administrative file, including the RFI Report, will be available to the public for viewing and copying at:

NASA Document Library
Merritt Island Public Library
1195 North Courtenay Pkwy.
Merritt Island, FL 32953
Telephone: (321) 455-1369

To request further information, you may contact one of the following people:

Mr. Harold Williams
Remediation Program Manager
Environmental Program Office
Mail Code: TA-C3
Kennedy Space Center, FL 32899
E-mail: Harold.G.Williams@nasa.gov
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Mr. John R. Armstrong, P.G.
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FACILITY DESCRIPTION

NASA established KSC as the primary launch site for the space program. These operations have involved the use of toxic and hazardous materials. Under the RCRA and applicable HSWA permit (Permit No.

FL6800014585) issued by FDEP and/or EPA, KSC was required to perform an investigation to determine the nature and extent of contamination from Solid Waste Management Unit (SWMU) No. 094, the PHSF.

SITE DESCRIPTION AND HISTORY

The PHSF is an active industrial site operated by NASA. The site consists of the PHSF Building (M7-1354), the Krypton Storage Building (M7-1303), the Oxidizer Shed (M7-1354A), the Fuel Transfer Building (M7-1354B), a Pump House (M7-1354C), the Transporter Storage Shed (M7-1355), a Turnstile Shelter (M7-1356), the Multi-Operations Support Building (MOSB) (M7-1357), the Line-of-Sight Antenna (M7-1357A) and three trailers (TR1-0730, TR1-0740, and TR1-0741 (Figure 1). The PHSF Building (M7-1354) was constructed in October 1984 and was completed in June 1986. The PHSF is a steel frame building covered with insulated metal siding which contains a Hazardous Operations Service Bay. The PHSF building is used as a payload processing facility. It is also used as a hazardous processing facility where ordnance installation; liquid propellant (hypergols) loading hazardous systems tests and checkout; buildup and mating of a payload to a solid propellant upper-stage motor; propellant system leak tests; and other potentially explosive or hazardous operations are performed. Operations at the PHSF entail the usage of commodities such as fuels: hydrazine, monomethyl hydrazine, unsymmetrical dimethyl hydrazine; and oxidizer: nitrogen tetroxide. Construction of the Krypton Storage Building (M7-1303) began in March 1985 and was completed in March 1987. The building was used to store krypton gas. Investigations conducted at the PHSF include:

- 1994: A Contamination Assessment (CA) was performed to investigate a petroleum spill. Soil samples analyzed at that time did not identify any constituents at concentrations exceeding soil cleanup target levels (SCTLs).
- 2004: A SWMU Assessment (SA) was conducted at the PHSF. Previous investigations identified in the SAR were primarily associated with routine compliance audits and inspections, petroleum product spills, and an underground storage tank closure. The SA required further investigations of eight Locations of Concern (LOCs).
- 2005: Confirmation Sampling (CS) was performed at the PHSF to investigate conditions at each of the eight LOCs identified in the SAR. The CS confirmed ammonia in groundwater at the PHSF.
- 2006: An RFI was performed to characterize the nature and extent of the ammonia identified in groundwater at the site. The RFI determined that groundwater in the PHSF area is impacted with ammonia concentrations above the Groundwater Cleanup Target Level (GCTL) value but below the Natural Attenuation Default Concentration (NADC).

SUMMARY OF SITE RISK

The Chemical of Concern (COC) identified for human health from the RFI is ammonia in groundwater (Table 1). No COCs were identified for soil.

Due to the lack of ecological habitat at PHSF no unacceptable ecological risk exists.

WHAT ARE THE REMEDY OBJECTIVES AND LEVELS?

The remedial action objective (RAO) is to protect humans from exposure to groundwater contaminants that exceed FDEP residential-use cleanup target levels by restricting use of site groundwater as a drinking water source. Table 1 lists the COC present in groundwater. The first column lists the chemical name, the second column lists the range of concentrations detected in groundwater, and the last column presents the FDEP cleanup target level.

Table 1

Site Related Chemical of Concern (COC)	Range of Detections ($\mu\text{g/L}$)	Site Specific Cleanup Level ¹ ($\mu\text{g/L}$)
Ammonia	3,100 - 5,000	2,800

¹ Cleanup levels are GCTLs from Florida Administrative Code 62-777

REMEDIAL ALTERNATIVES FOR THE PHSF

Remedial alternatives are different combinations of plans or technologies to restrict access, and to contain or treat contamination to protect human health and the environment. Because of the low levels of groundwater contamination present at the PHSF only one remedy was considered for the PHSF.

Land Use Controls and Natural Attenuation with Long-Term Monitoring

Under this alternative, material processes such as biological degradation, dispersion, advection, and adsorption will reduce COC concentrations to cleanup levels over time. Groundwater will be regularly sampled and analyzed to monitor and document the decrease in contaminant concentrations.

In the long term this alternative will meet RAOs and will also allow re-evaluation to determine if the remedy is working and provide an opportunity for change if necessary. In addition, institutional controls will be implemented to limit the use of groundwater as a drinking water source. NASA, EPA, and FDEP have entered into a Memorandum of Agreement (MOA) that outlines how institutional controls will be managed at NASA². Controls will include periodic inspection, condition certification and agency notification. The area of the site that will be under institutional control is shown on Figure 2.

EVALUATION OF REMEDY

The selected remedy was evaluated to determine if it will comply with EPA's four threshold criteria for corrective measures.

The four threshold criteria for corrective measures are:

- overall protection of human health and the environment;
- attain media cleanup standards;
- control the sources of releases; and
- comply with standards for management of wastes.

Land Use Controls and Natural Attenuation with Long-Term Monitoring meet the threshold criteria and were determined to be the best overall approach with respect to the balancing criteria.

² By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

WHAT IMPACTS WOULD THE REMEDY HAVE ON THE LOCAL COMMUNITY?

There would be no impacts to the local community because groundwater is not used for potable water at KSC. The natural attenuation and long-term monitoring alternative includes administrative actions to limit the use of groundwater until the cleanup levels have been reached.

WHY DOES THE KSC REMEDIATION TEAM RECOMMEND THIS REMEDY?

The team recommends the proposed remedy because the naturally occurring processes observed at the site are sufficient for the removal of low concentrations of ammonia. Long-term monitoring results will be used to document reduction in contamination concentrations to the cleanup target levels.

The institutional controls will also prevent exposure to contaminants prior to the cleanup levels being achieved. The proposed remedy meets the four general standards for corrective measures and was determined to be the best overall approach with respect to the balancing criteria.

NEXT STEPS

The KSC Remediation Team will review all comments on this SB to determine if the proposed remedy needs modification prior to implementation and prior to incorporating the proposed remedy into KSC's HSWA

permit. If the proposed remedy is determined to be appropriate for implementation, then a long-term monitoring program will be initiated, and a Land Use Control Implementation Plan will be developed to incorporate the institutional controls at this site.

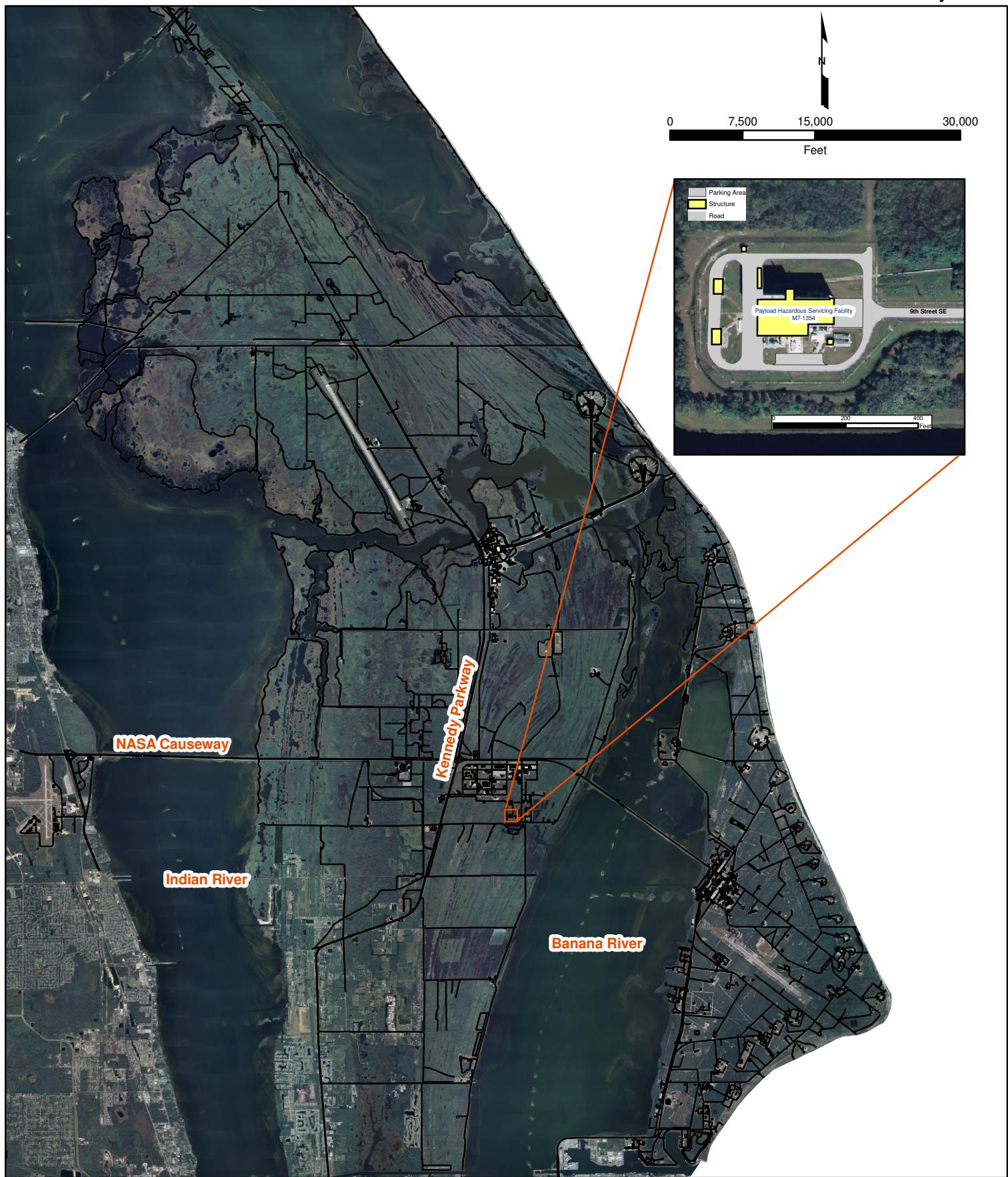


Figure 1
Location Map
Payload Hazardous Servicing Facility (PHSF; SWMU 094)

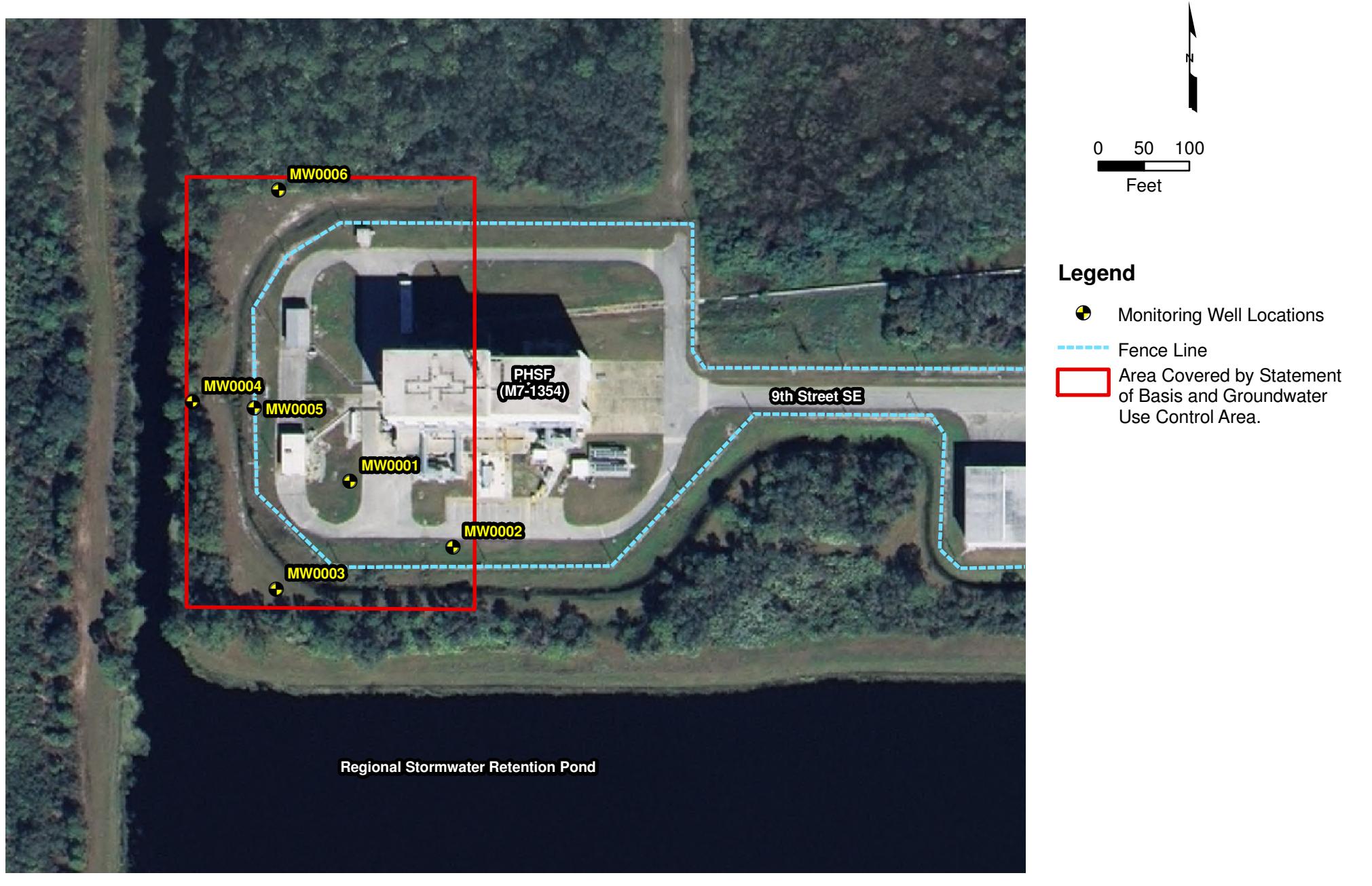


Figure 2
Site Map of Payload Hazardous Servicing Facility (SWMU 094)