



STATEMENT OF BASIS

**PROCESSING CONTROL CENTER AREA (SWMU 101)
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 Processing Control Center (PCC) Area (PCCA). The PCCA is in the Vehicle Assembly Building (VAB) Area of KSC, southwest of the Crawlerway at the intersection of Utility Road and VAB Road. The facility is bordered by the Orbiter Processing Facility (K6-0894) to the north, Utility Road to the east, VAB Road to the south, and railroad tracks to the west (Figure 1). The Kennedy Space Center (KSC) Remediation Team (KSCRT), 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 KSCRT 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 KSCRT 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 vinyl chloride (listed in Table 1) is present in groundwater, which could be potentially harmful to human health if this water is used for human consumption now or in the future.

HOW DO YOU PARTICIPATE?

The KSCRT solicits public review and comment on this SB before implementing the proposed remedy. The remedy for the PCCA will eventually be incorporated into the Hazardous and Solid Waste Amendments (HSWA) Permit for KSC.

The Cleanup Remedy

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

- Attenuation of vinyl chloride in groundwater through naturally occurring processes.
- Monitoring of groundwater to document natural attenuation of vinyl chloride.
- Implementation of institutional controls to prohibit use of groundwater as a potable water supply.

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 will end 45 days thereafter.

If requested during the comment period, the KSCRT will hold a public meeting to

respond to any oral comments or questions regarding the proposed remedy.

To request a hearing or to provide comments, contact the following persons in writing within the 45-day comment period:

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Mr. John R. Armstrong, P.G.
FDEP - Bureau of Waste Cleanup
Federal Facilities Section
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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. 0026028-HO-005) issued by the FDEP, KSC was required to perform an investigation to determine the nature and extent of contamination from Solid Waste Management Area (SWMU) 101, the PCCA.

SITE DESCRIPTION AND HISTORY

The PCCA was developed in the mid 1960’s to support the Apollo and Saturn Programs. During construction of the VAB, a cooling tower water treatment facility (K6-0945), one elevated storage tank (K6-0994), and

one water storage tank (K6-0946) were constructed to support the water generated from the VAB air conditioning system. One Storage Building (K6-0996) was also constructed during this time to support VAB operations. By 1967, a temporary building was constructed to support the VAB construction and was named the VAB Support Facility (K6-1045). Five trailers (formerly K6-1043A through D and K6-1044) were staged at the site Between 1980 and 1990 that may have been utilized to house employees during renovations to the VAB Support Facility. These temporary facilities were relocated prior to 1991. In the mid-1980s two additional storage buildings (K6-0996A and K6-1046) were constructed. In 1995 one additional water storage tank (K6-0995) was constructed. The VAB Support Facility remained in the PCCA until 1991 when it was demolished to make way for the PCC Facility (K6-1094). The cooling tower was also demolished in 1991.

SWMU 101 has parking areas adjacent to the PCC to the north and east and grass to the west and south. The storage buildings are located in the center of the area and the water tanks are located in the northeast corner of the Site as shown on [Figure 1](#).

The site is currently developed with seven numbered buildings and one undesignated shed as shown on [Figure 2](#).

The PCCA currently contains:

- two storage buildings (K6-0996 and K6-1046)
- one maintenance shop (K6-0996A)
- one storage shed (undesignated)
- two water tanks (K6-0946 and K6-0995)
- one water tower (K6-0994)
- Processing Control Center (K6-1094).

One investigation was conducted at the site when a hydraulic line on a forklift ruptured during cleaning operations at the PCCA in 1999. Absorbent was applied and a soil excavation was performed to remove affected soil. No additional spills have been documented at the Site.

SWMU Assessment (2006)

A SWMU Assessment Report (SAR) was completed in 2006 to assess the potential for historical and current activities to have affected the environment. Six locations of concern (LOC) were identified:

- LOC 1: Water Tank Area (K6-0994, K6-0995, and K6-0946)
- LOC 2: Maintenance Shop (K6-0996A) and Storage Area
- LOC 3: Storage Building (K6-0996)
- LOC 4: Storage Building (K6-1046)
- LOC 5: Former Hydraulic Oil Spill
- LOC 6: Former Transformer Location

Confirmatory Sampling (2006-2007)

CS activities were conducted in 2006, and the results indicated that the soil at the PCCA were impacted with lead and polychlorinated biphenyls (PCBs) above applicable screening criteria. Vinyl chloride was detected in groundwater at levels exceeding the FDEP Groundwater Cleanup Target Level (GCTL). Additionally, leachate samples for PCBs and lead indicated potential groundwater impacts.

RFI (2007-2008)

An RFI was performed to characterize the nature and extent of PCBs, lead, and vinyl chloride in groundwater and lead and PCBs in soil at the PCCA. Additional testing did

not confirm lead or PCBs in groundwater; therefore these COCs in groundwater were granted NFA by the FDEP. Additional investigation was completed to delineate the horizontal and vertical extent of vinyl chloride in groundwater. Based upon the concentrations of vinyl chloride, a long-term monitoring (LTM) program was recommended for the Site. PCBs and lead in soil were delineated and an Interim Measure Work Plan (IMWP) was submitted and approved by the FDEP. The RFI recommended implementing the LTM program to monitor natural attenuation as the selected remedy for groundwater and the IMWP for soil. The LTM program was implemented in May 2008 and the IM was completed in 2009. Upon completion of the soil IM, a NFA for soil was granted by the FDEP.

SUMMARY OF SITE RISK

As part of the RFI activities, a Preliminary Risk Evaluation (PRE) was completed in accordance with KSCRT Decision Process Document.

One Constituent of Concern (COC), vinyl chloride, was identified for human health concerns in groundwater from the RFI. No COCs were identified in soil after completion of the IM.

The lifetime excess cancer risk for groundwater at the PCCA was calculated to be 6.9×10^{-5} due to vinyl chloride concentrations in groundwater. This exceeded the threshold value of 1×10^{-6} used by FDEP. There were no detected constituents that contributed to non-cancer risks.

Both of these scenarios assume use of site groundwater as a drinking water source. However, there is no current use of site groundwater and no exposure or current

risks. Due to the lack of ecological habitat at the PCCA, no unacceptable ecological risk is present.

WHAT ARE THE REMEDY OBJECTIVES AND LEVELS?

The remedial action objective (RAO) is to protect humans from exposure to groundwater that exceeds FDEP cleanup target levels and/or naturally occurring concentrations by prohibiting 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 monitoring wells, and the last column presents the site specific cleanup target level.

Table 1

Site-Related COC	Range of Detections (µg/L)	GCTL ¹ (µg/L)
Vinyl chloride	1.5 to 3.2	1

Cleanup levels established by Chapter 62-777 FAC .

REMEDIAL ALTERNATIVES FOR THE PCCA

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.

Land Use Controls and Natural Attenuation with Long-Term Monitoring:

Because of the low levels of COCs in groundwater present at the PCCA, only one remedy was considered for groundwater at the site.

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 COC concentrations. In the long-term this alternative will meet the RAO.

Ongoing evaluation of the alternative will be conducted to determine whether the remedy is working and to provide an opportunity for change if necessary. In addition, institutional controls will be implemented to prohibit the use of groundwater as a drinking water source. NASA and the FDEP have entered into a Memorandum of Agreement (MOA) that outlines how institutional controls will be managed at NASA¹. 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 3](#).

¹ By separate MOA effective February 23, 2001, with the FDEP and 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 the 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, 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.

EVALUATION OF REMEDY

The selected remedy was evaluated to determine if it will comply with the four threshold criteria and five balancing criteria established 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.

The following are the five balancing criteria considered for corrective measures:

- Long-term reliability and effectiveness;
- Short-term effectiveness;
- Reduction in the toxicity, mobility, and volume of wastes;
- Implementability; and
- Cost.

Land Use Controls and natural attenuation with LTM meet the threshold criteria and were determined to be the most appropriate approach with respect to balancing the criteria.

WHAT IMPACTS WOULD THE REMEDY HAVE ON THE LOCAL COMMUNITY?

There would be no impacts to the local community because administrative actions to limit access to the site are consistent with current operating procedures, and the projected future land use of the PCCA is industrial in nature.

WHY DOES THE KSCRT RECOMMEND THIS REMEDY?

The KSCRT recommends the proposed remedy because the naturally occurring processes observed at the site are sufficient for the reduction of vinyl chloride concentrations in groundwater to RAOs. Long-term monitoring will be used to monitor and document reduction in vinyl chloride concentrations to the cleanup target levels.

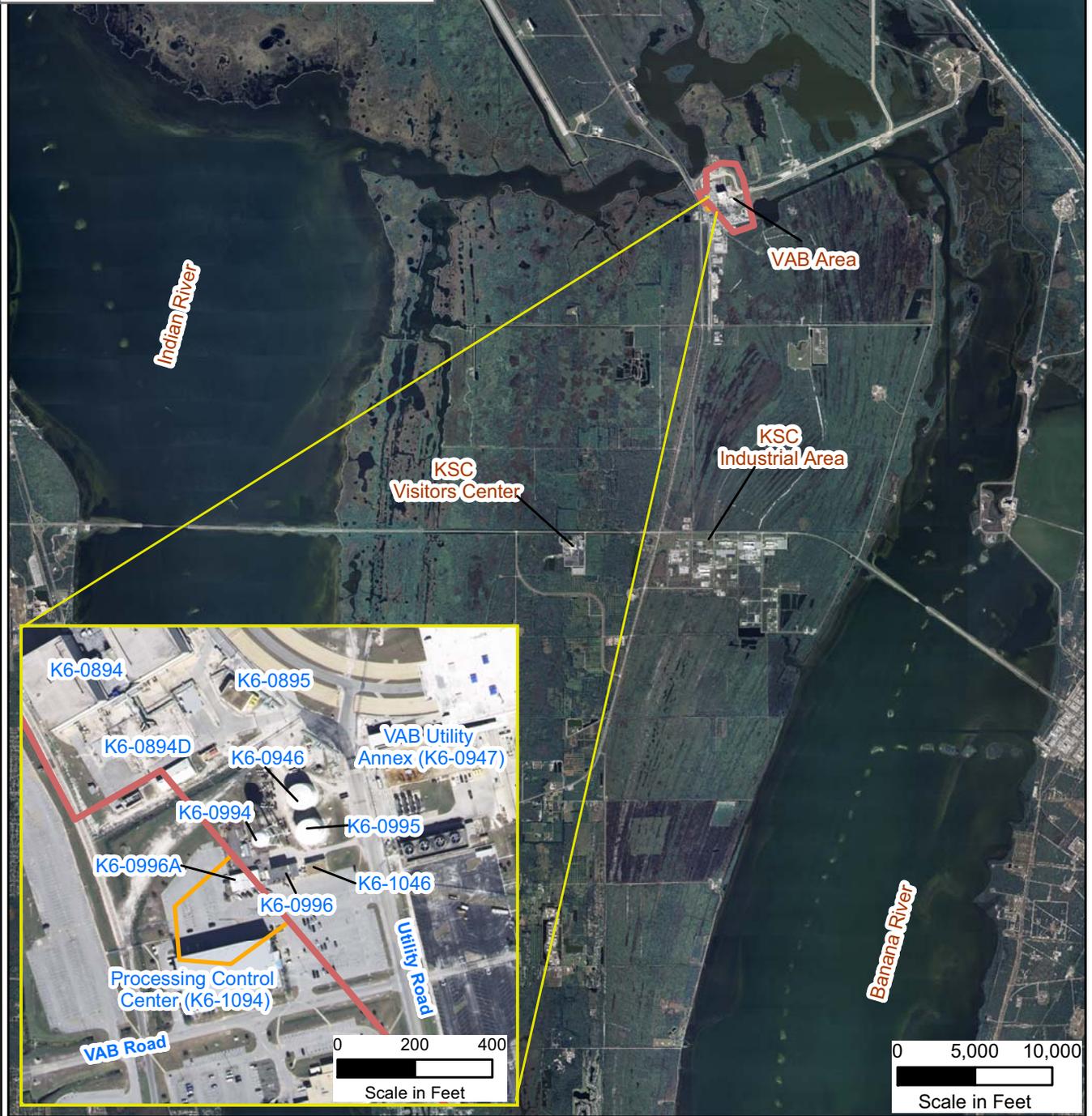
The institutional controls will also prevent exposure to contaminants prior to the cleanup levels being achieved. The proposed remedy meets the four general standards for corrective measures and was determined to be the best overall approach with respect to the balancing criteria.

NEXT STEPS

The KSCRT 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 (LUCIP) will be developed to incorporate the institutional controls at this site.

Notes:
 KSC - Kennedy Space Center
 LUC - Land Use Control
 NASA - National Aeronautics and Space Administration
 PCCA - Processing Control Center Area
 SB - Statement of Basis
 SWMU - Solid Waste Management Unit
 VAB - Vehicle Assembly Building

KSC-TA-11461
 PCCA SB
 Revision: 0
 March 2011



Legend

- VAB LUC Area (to the north and east)
- PCCA LUC Area



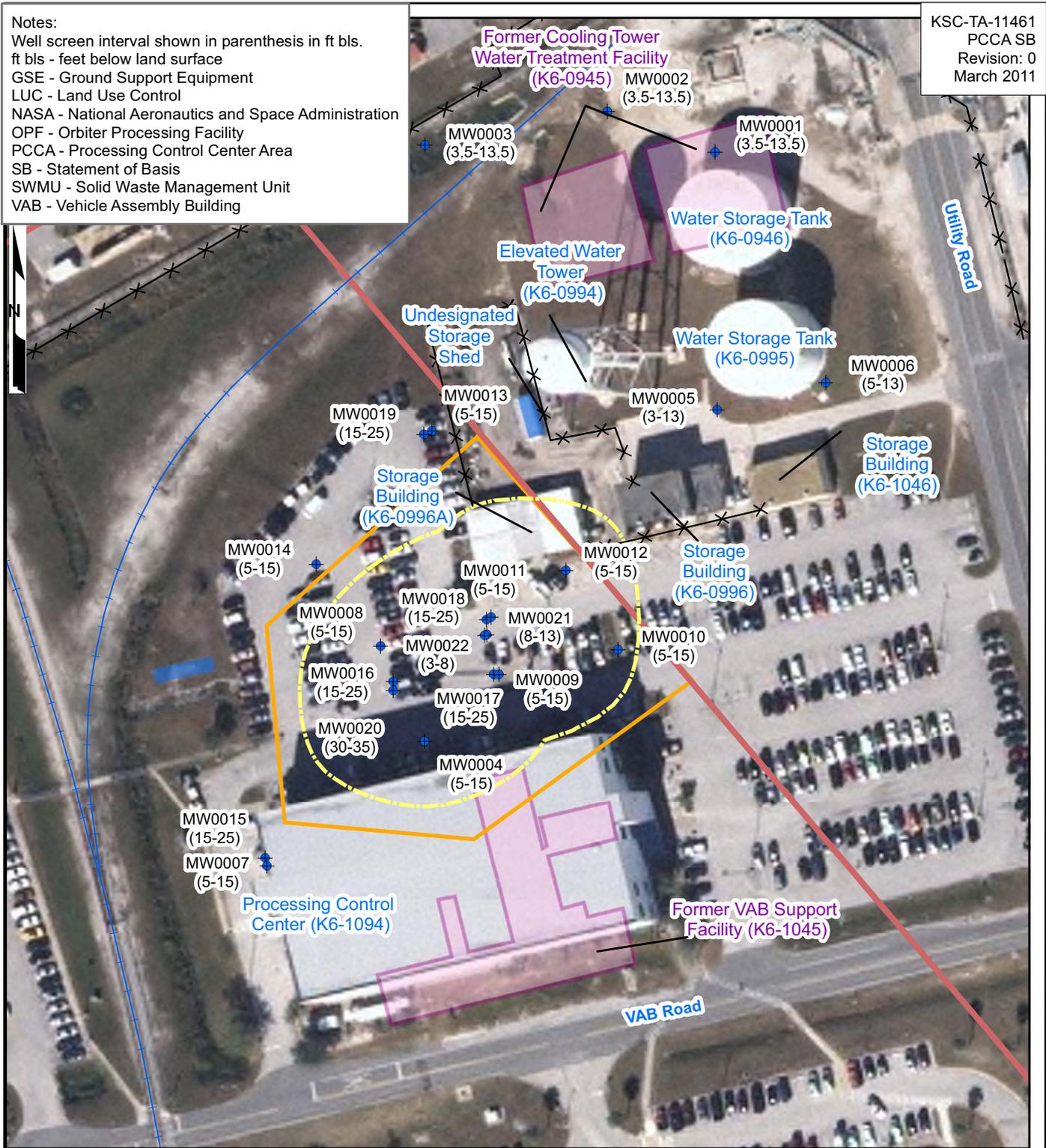
**Site Location Map - SWMU 101
 Statement of Basis**

Processing Control Center Area
 NASA Kennedy Space Center, Florida

Notes:

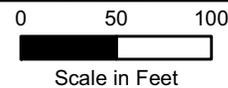
Well screen interval shown in parenthesis in ft bls.
 ft bls - feet below land surface
 GSE - Ground Support Equipment
 LUC - Land Use Control
 NASA - National Aeronautics and Space Administration
 OPF - Orbiter Processing Facility
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 PCCA SB
 Revision: 0
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Legend

- ◆ Monitoring Well Location
- ▭ VAB LUC Area (to the north and east)
- ▭ PCCA LUC Area
- ▭ Approximate Area of Vinyl Chloride-Affected Groundwater
- ▭ Former Facility
- × Fence
- Railroad



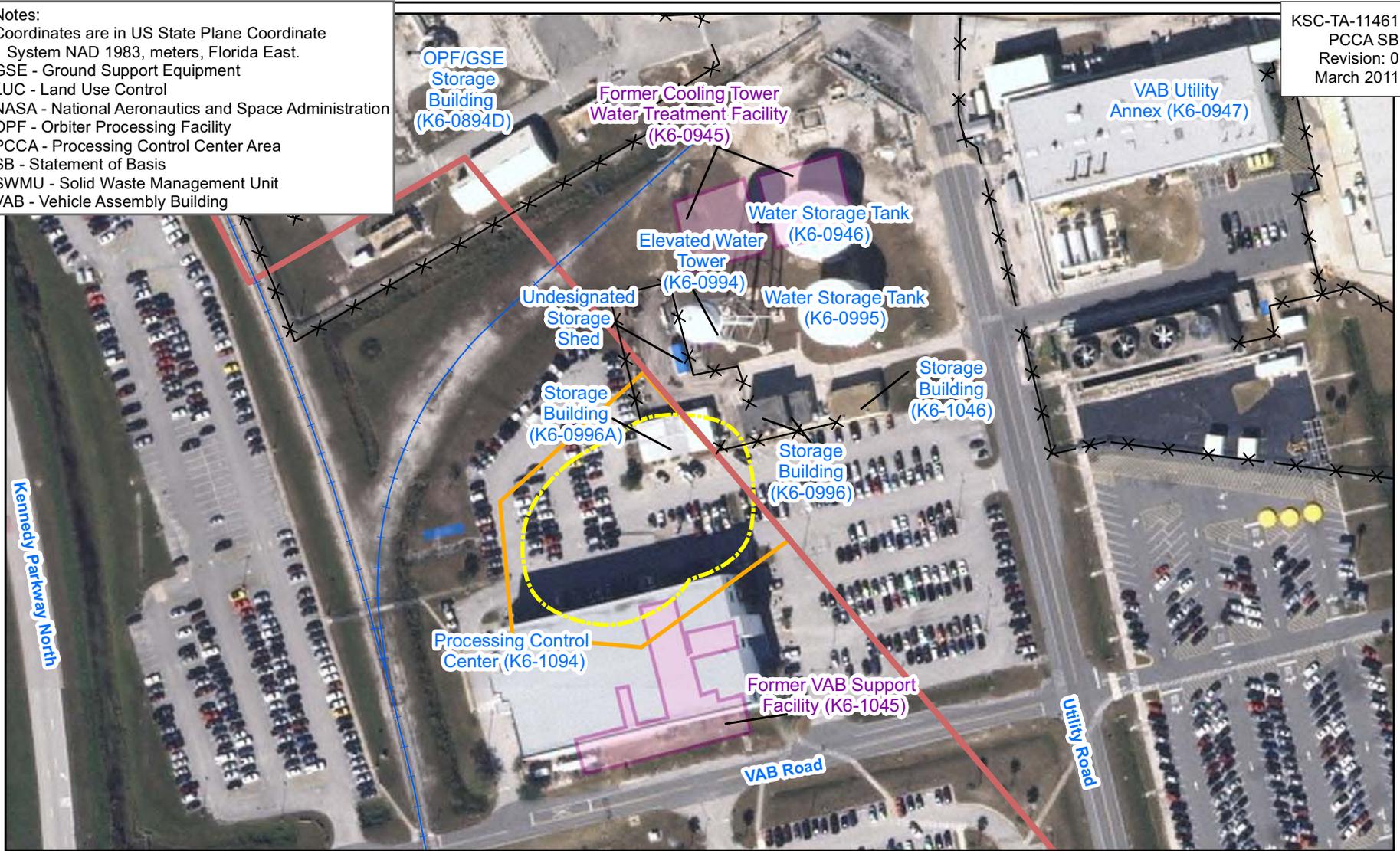
**Site Plan - SWMU 101
 Statement of Basis**

Processing Control Center Area
 NASA Kennedy Space Center, Florida

Notes:

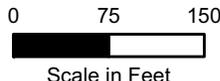
Coordinates are in US State Plane Coordinate System NAD 1983, meters, Florida East.
 GSE - Ground Support Equipment
 LUC - Land Use Control
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 PCCA - Processing Control Center Area
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 VAB - Vehicle Assembly Building

KSC-TA-11461
 PCCA SB
 Revision: 0
 March 2011



Legend

- Railroad
- Fence
- VAB LUC Area (to the north and east)
- PCCA LUC Area
- Approximate Area of Vinyl Chloride-Affected Groundwater
- Former Facility



**Area Under Institutional Controls - SWMU 101
 Statement of Basis**

Processing Control Center Area
 NASA Kennedy Space Center, Florida

Project Number: 004-11302-32

Figure 3