



**STATEMENT OF BASIS
ENGINEERING DEVELOPMENT LABORATORY SWMU 85
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER**

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 Engineering Development Laboratory¹ (EDL). 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 vinyl chloride (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 EDL will eventually be incorporated into the Hazardous and Solid Waste Amendments (HSWA) Permit for Kennedy Space Center (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 provide comments, contact the following person in writing within the 45-day comment period:

<p>The Cleanup Remedy</p> <p>The proposed cleanup remedy for the EDL includes the following components:</p> <ul style="list-style-type: none"> • 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.
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¹ In accordance with RCRA §7004(b), this Statement of Basis summarizes the proposed remedy for the NASA EDL Site. For detailed information on the site, consult the EDL Site RFI Report, which is available for review at the information repository located at the North Brevard Library, 2121 South Hopkins Avenue, Titusville, FL 32780, telephone: (321) 264-5026.

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
 North Brevard Library
 2121 South Hopkins Avenue
 Titusville, FL 32780
 Telephone: (321) 264-5026

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
 Telephone: (321) 867-8411

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

FACILITY DESCRIPTION

NASA established the 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 the 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. 85, the EDL.

SITE DESCRIPTION AND HISTORY

The EDL is a NASA-operated facility that consists of six permanent structures constructed from 1966 to 2001 (Figures 1 and 2). The EDL Building (M7-409) was constructed to support astronaut training for the Apollo Program, including the use of mock-ups such as the Lunar Lander. This building is currently being used as office space, a prototype machine shop and material testing, and for development activities. The Equipment Building (M7-409A) houses a large bank of electrical transformers. This building is currently used for the storage of refurbished compressors and office space. The former Generator Building (M7-409B) was constructed in December 1968, but is no longer used as a generator facility and is now classified as a storage building. The International Space Station Center Tour Stop Concession Building (M7-459) was constructed in December 1998 and provides food, restroom, and retail items for visitors on the KSC tour. The Tour Stop Concession Building was constructed in the former location of two cooling towers, which provided climate control for the EDL from 1966 until 1994. The cooling towers were designated PRL #66 and a Solid Waste Management Unit (SWMU) Assessment (SA) and Confirmation Sampling (CS) were performed from 1995 to 2000. The Storage Buildings (M7-460 and M7-460A) were constructed in July 2001. The buildings are a staging annex for the EDL and are used to stage and kit the Mobile Launch Platform Hazardous Gas Detection System.

Investigations conducted at the EDL include:

- June - July 1995: A 2,000-gallon diesel Underground Storage Tank (UST) located on the western side of the Equipment Building (M7-409) was abandoned in place. No soil or groundwater impacts were detected.
- 1998: Confirmatory Sampling of the Cooling Tower Discharge Area revealed iron in groundwater above the drinking water criteria in an unfiltered monitoring well sample. In addition, metals were detected above ecological criteria in the unmaintained pond located to the south of the EDL. However the detected constituents were not attributable to the former cooling tower discharge, and it was recommended that the discharge be further evaluated in a SWMU Assessment (SA) of the EDL.
- 2003: A SWMU Assessment (SA) was conducted and recommended that confirmatory sampling be performed at locations with matrices that were found to exceed screening levels. The EDL SA identified eight Locations of Concern (LOCs) which warranted further investigation in a Confirmation Sampling investigation.
- April 2004: Confirmation Sampling (CS) of soil, sediment and groundwater at 20 locations was performed at EDL. Vinyl chloride in groundwater was the only constituent detected above FDEP Groundwater Cleanup Target Levels (GCTLs). All other media with concentrations greater than FDEP soil or groundwater cleanup target levels were found to be lower than natural background values or other applicable reference values based on general site use (Parking/Traffic Area values).

- April 2005: Phase I of the RCRA Facility Investigation (RFI) was conducted, which included installation of two microwells and the collection of water levels, surface soil samples, subsurface soil samples, and Direct Push Technology (DPT) groundwater samples. The only constituent retained as a chemical of potential concern (COPC) was vinyl chloride in groundwater. A Preliminary Risk Evaluation (PRE) was conducted in conjunction with the RFI. The PRE for groundwater indicated that the lifetime excess cancer risk is above the threshold used by FDEP to identify potentially significant cancer risk associated with using the site groundwater as a drinking water source. However, there is no current use of the site groundwater and therefore no exposure or current risk. No ecological habitat was identified at the site.

SUMMARY OF SITE RISK

As part of the RFI activities a Preliminary Risk Evaluation (PRE) was completed in accordance with KSC's Remediation Team Risk Assessment Decision Process Document (DPD).

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

The PRE indicated the estimated excess lifetime cancer risk for the hypothetical future resident was 3.8×10^{-6} , which exceeds FDEP's acceptable level of 1×10^{-6} . This assumes use of site groundwater as a drinking water source. However, there is no current use of site groundwater and therefore no exposure or current risk.

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 (µg/L)	Site Specific Cleanup Level ¹ (µg/L)
Vinyl chloride	2.3-3.8	1

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

REMEDIAL ALTERNATIVES FOR THE EDL

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 EDL only one remedy was considered for the EDL.

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. Data collected during the RFI indicated that natural attenuation mechanisms will likely reduce contaminant concentrations below cleanup levels within five years. 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 the 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.

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.

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.

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 VOCs. The long-term monitoring will be used to monitor and 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.

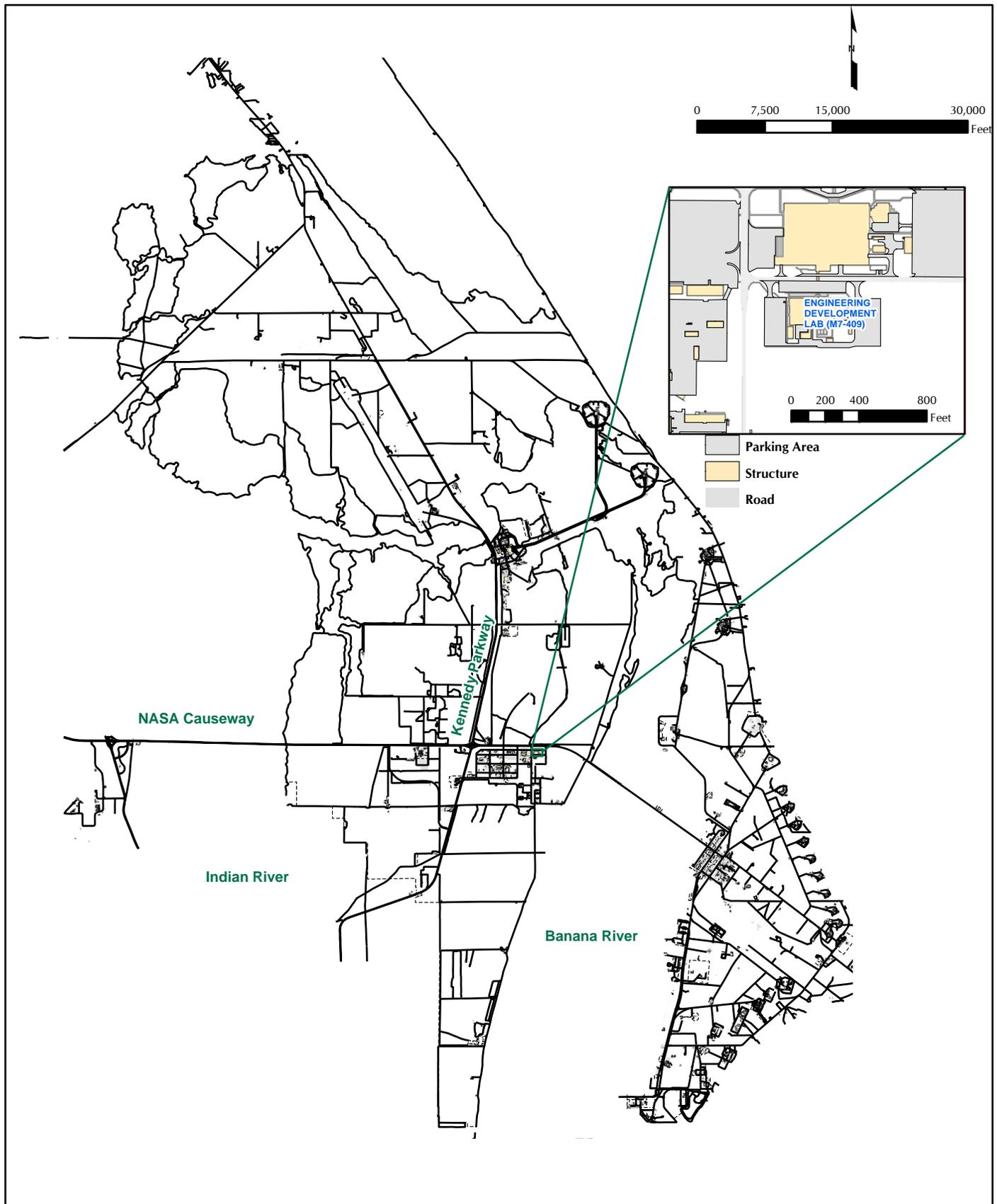


Figure 1
Location Map
Engineering Development Laboratory (EDL; SWMU 85)

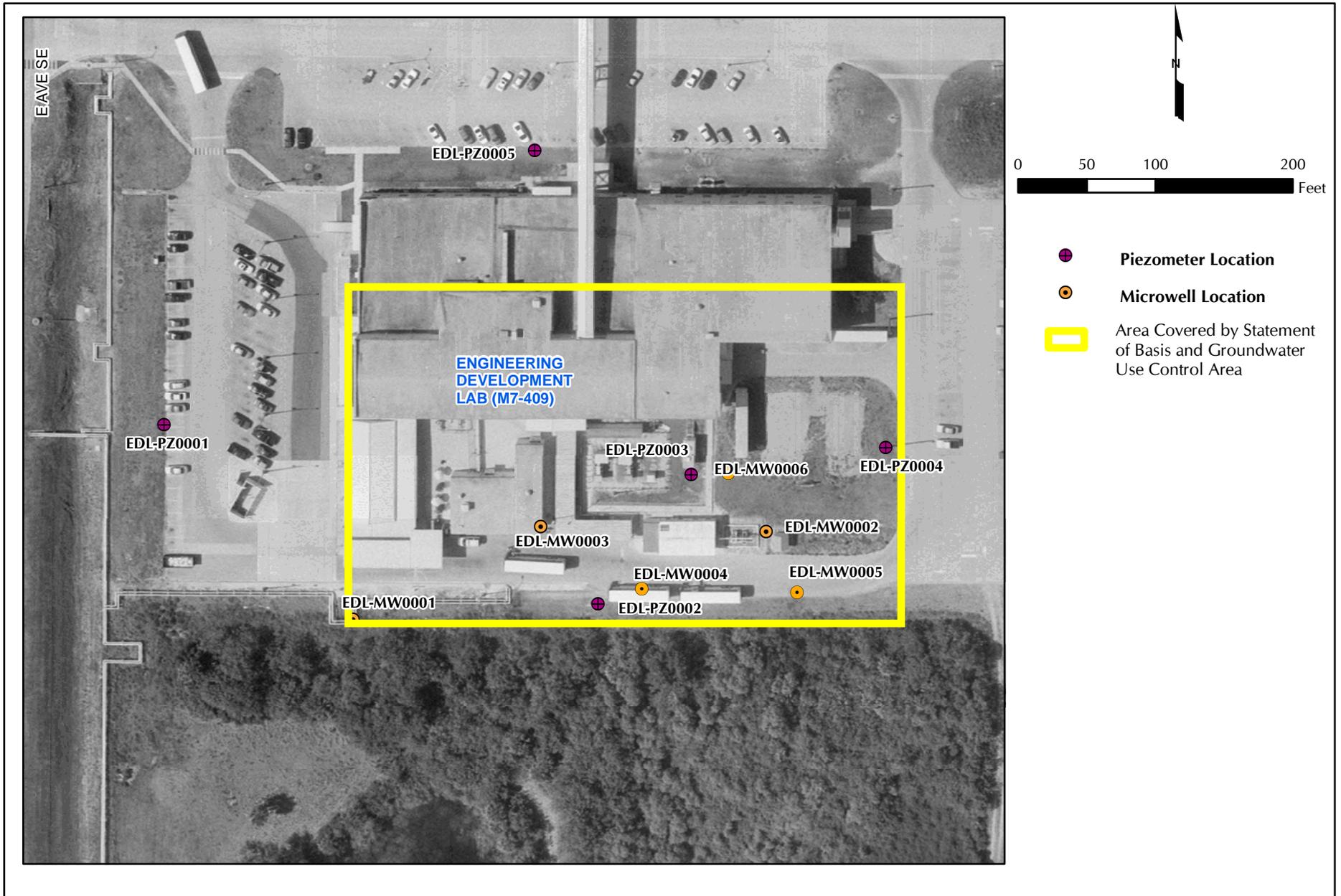


Figure 2
Site Map
Engineering Development Laboratory (EDL; SWMU 85)