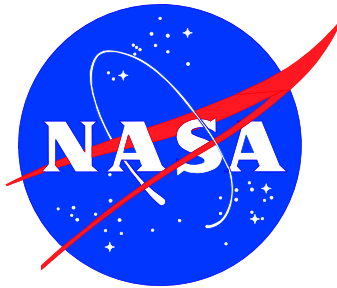


**HEADQUARTERS BUILDING SOIL EXCAVATION
INTERIM MEASURES WORK PLAN**

KENNEDY SPACE CENTER, FLORIDA

Prepared for:



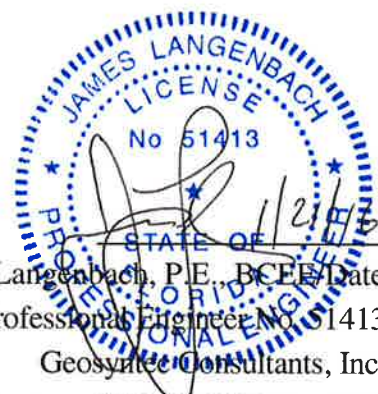
**National Aeronautics and Space Administration
Kennedy Space Center, Florida**

**January 2016
Revision 0**

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PROFESSIONAL CERTIFICATION AND APPROVAL

I hereby certify that in my professional judgment that this document entitled: *Headquarters Building Soil Excavation, Interim Measures Work Plan, Kennedy Space Center, Florida*, generally satisfies the requirements set forth in Chapter 471, Florida Statutes, and other applicable rules and regulations of the state of Florida. I have completed and/or been in responsible charge of work completed by qualified professionals working directly under my supervision.



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INTERIM MEASURES WORK PLAN FOR PCB-CONTAMINATED SITES

Facility Name/SWMU No.: Headquarters Building Area (SWMU 104)
Consultant/PM: Geosyntec Consultants, Inc./Eric Sager, P.G.
NASA RPM: Anne Chrest, P.E.
CAMP Date: December 2015
Prepared On: December 2015
Revised On:

NOTE: This work plan will be implemented in accordance with the provisions presented in NASA-KSC's *Generic Work Plan for the Investigation And Cleanup of PCB-Contaminated Sites under the Toxic Substances Control Act* (February 2007) unless otherwise noted below.

General

1. What is the purpose of this proposed Interim Measures? Include a list of the parameter groups being addressed by the IM. This document presents and discusses the Interim Measures (IM) Work Plan (IMWP) for Location of Concern (LOC) 2D and LOC 2E located at the Kennedy Space Center (KSC) Headquarters Building Area (KHQA; Figure 1 and Figure 2). The purpose of the proposed IM activities is to mitigate human health risks by removing media affected with polychlorinated biphenyls (PCBs) at as found concentrations above the Florida Department of Environmental Protection (FDEP) Residential-Direct Exposure Soil Cleanup Target Level (R-SCTL) of 0.5 milligrams per kilogram (mg/kg) and the Toxic Substance Control Act (TSCA) screening criteria of 50 mg/kg. Previous IM activities removed PCB-affected media from portions of LOC 2D and LOC 2E (Figure 2); however, all areas of PCB-affected media could not be removed due to existing electrical equipment, underground utilities, and building footers. At LOC 2D, PCB-affected media remains beneath the transformer pad and between the transformer pad and the building. At LOC 2E, the PCB-affected concrete pad was encapsulated in accordance with 40 Code of Federal Regulation 761 and remains in place. In addition, PCB-affected media also remains beneath the transformer and between the transformer pad and the building.

2. Describe facility usage. The KHQA is located in the KSC Industrial Area. The site is bordered by NASA Parkway to the North, D Avenue SE to the East, 3rd Street SE to the South, and C Avenue SE to the west. The site is bisected by two east-west streets. 1st Street SE is located between NASA Parkway and the north side of the Headquarters Building (M6-0399) and 2nd Street SE is located between the south side of the Headquarters Building and the asphalt parking area.

The KSC Headquarters Building is located in the IM area. The Headquarters Building houses the KSC Center Director, NASA staff and management, and contractor and support personnel. The

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Headquarters Building also includes a cafeteria, library, travel office, film and photo archive, photo-processing shop, print shop, barber shop, bank, sundry store, and post office. The Headquarters Building is scheduled for demolition in 2017.

3. Is the facility normally occupied? Describe how site control will be performed and how area workers will be informed of health and safety issues associated with the Interim Measures. The areas of the proposed IM activities are usually occupied during normal business hours. However, the intended plan is to excavate PCB-affected media after the Headquarters Building has been vacated and during building demolition. It is assumed that the IM will be performed after the walls of building have been demolished, but the concrete footings will be in place. Safety barricades, caution tape, and/or fencing will be used to identify the work and support zones and to restrict entry. During excavation, a site supervisor will be on site as a contact person and to maintain operational safety. IM activities will be scheduled and coordinated with the construction personnel to minimize disruptions and potential delays and protect worker's safety.

4. When did the release(s) occur at this facility, if known? It is unknown when the release(s) occurred.

5. Are the PCB detections associated with a liquid release, paint residue, or other (please describe)? The specific release mechanism is unknown. However, the presence of PCB-affected media around electrical equipment suggests a liquid release.

Interim Measures Information

6. List the specific contaminants being addressed by the IM, maximum facility concentrations, and the associated proposed cleanup goals and source(s) (industrial SCTL, etc.).

Contaminant	Maximum As-Found Concentration (mg/kg)	Cleanup Goal (mg/kg)	Cleanup Goal Source
PCBs – LOC 2D-1	0.22 ^(a)	0.5	FDEP R-SCTL
PCBs – LOC 2D-2	1,800	0.5	FDEP R-SCTL
PCBs – LOC 2D-3	49	0.5	FDEP R-SCTL
PCBs – LOC 2D-4	7.6	0.5	FDEP R-SCTL
PCBs – LOC 2D-5	1.6	0.5	FDEP R-SCTL
PCBs – LOC 2D-6	0.53	0.5	FDEP R-SCTL

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PCBs – LOC 2E-1	1,500	0.5	FDEP R-SCTL
PCBs – LOC 2E-2	26	0.5	FDEP R-SCTL
PCBs – LOC 2E-3	40.8	0.5	FDEP R-SCTL
PCBs – LOC 2E-4	2.01	0.5	FDEP R-SCTL

Notes: (a) The maximum detected concentration of PCBs in the concrete transformer pad at LOC 2D-1 was less than the FDEP R-SCTL. However, the concrete transformer pad will be removed for disposal because it rests upon soil affected with non-TSCA PCB concentrations (greater than 0.5 mg/kg and less than 50 mg/kg).

7. Will a LUCIP (land use control implementation plan) be required following completion of the IM (i.e., will residual concentrations of any contaminant exceed applicable residential criteria)? A Land Use Implementation Plan will not be required. The goal of this IM is to obtain No Further Action without Controls for the KHQA.

8. List each proposed excavation area, contaminants of concern, area of excavation, and associated depth intervals. Include figure(s) showing the horizontal extent of each proposed excavation area.

Area ^(a)	Contaminant(s) of Concern	Area of Excavation (feet ²)	Depth Interval (ft BLS)	Comments
Area of LOC 2D-1 Non-TSCA Concrete	PCBs	1663	0 – 0.5	Volume = 31 yards Figure 3 and Figure 7
Area of LOC 2D-2 ^(c) TSCA Soil	PCBs	478	0 – 4.0 or 7.0 ^(b)	Volume = 71 or 124 yards ^(b) Figure 4 and Figure 8
Area of LOC 2D-3 ^(c) Non-TSCA Soil	PCBs	312	0 – 4.0 or 7.0 ^(b)	Volume = 46 or 81 yards ^(b) Figure 4 and Figure 8
Area of LOC 2D-4 ^(c) Non-TSCA Asphalt, Roadbase, and Soil	PCBs	454	0 – 2.0	Volume = 34 yards Figure 4 and Figure 8
Area of LOC 2D-5 Non-TSCA Asphalt, Roadbase, and Soil	PCBs	252	0 – 1.0	Volume = 9 yards Figure 4 and Figure 8
Area of LOC 2D-6 Non-TSCA Asphalt, Roadbase, and Soil	PCBs	77	0 – 0.5	Volume = 1 yards Figure 4 and Figure 8

INTERIM MEASURES WORK PLAN FOR PCB-CONTAMINATED SITES

Area ^(a)	Contaminant(s) of Concern	Area of Excavation (feet ²)	Depth Interval (ft BLS)	Comments
Area of LOC 2E-1 ^(d) TSCA Concrete	PCBs	202	0 – 0.5	Volume = 4 yards Figure 5 and Figure 9
Area of LOC 2E-2 Non-TSCA concrete	PCBs	1025	0 – 0.5	Volume = 19 yards Figure 5 and Figure 9
Area of LOC 2E-3 ^(c) Non-TSCA Soil	PCBs	803	0 – 4.0 or 7.0 ^(b)	Volume = 119 or 208 yards ^(b) Figure 6 and Figure 10
Area of LOC 2E-4 ^(c) Non-TSCA Soil	PCBs	58	0 – 1.0	Volume = 2 yards Figure 6 and Figure 10

Notes: (a) Coordinates for excavation areas are depicted on the figures, and the coordinates of soil borings that will be removed as part of the IM area summarized in Table 1. The locations/coordinates are based on physical measurements from known locations (e.g. corner of transformer pad) because of inconsistencies with Global Positioning System coordinates caused by interference from the nearby building. Prior to building demolition, the excavation area shall be marked using physical measurements based on the site features and surveyed by a professional surveyor. Following building demolition and prior to IM activities, the excavation areas shall be remarked by a professional surveyor.

(b) PCB-affected media was left in place following previous IM activities due to subsurface obstructions. Vertical confirmation samples shall be collected from 4.0 to 5.0 feet (ft) below land surface (BLS) to confirm that PCB-affected media is removed during implementation of this IMWP. If the concentrations of PCBs in the vertical confirmation samples are below the FDEP R-SCTL, the excavation will only extend to 4.0 ft BLS. If the concentrations of PCBs in the vertical confirmation samples are above the FDEP R-SCTL, then the excavation will extend to the water table (approximately 7.0 ft BLS).

(c) PCB-affected media was left in place following previous IM activities due to subsurface obstructions. The excavation will extend up to the side of the Headquarters building, and horizontal confirmation samples (soil and/or concrete) shall be collected to confirm that concrete footings are not affected with PCBs at concentrations above screening criteria and PCB-affected media does not extend beneath the building. If the concentrations of PCBs in the horizontal confirmation samples are above the FDEP R-SCTL, then the excavation will be extended horizontally. Additional horizontal confirmation samples will be collected as described in #9.

(d) The area of TSCA concrete in LOC2E-1 extends horizontally to concrete samples with PCB concentrations below TSCA screening criteria.

9. Will confirmation samples be required? If so, describe. Consider the need for both vertical and horizontal extent samples and indicate sampling frequencies (number of samples per square foot, etc.). Yes, PCB-affected media was left in place following previous IM activities, and vertical confirmation samples shall be collected from 4.0 to 5.0 ft BLS at the locations of previous exceedances where soil was left in place to confirm PCB-affected media is removed during implementation of this IMWP. Four samples will be collected along the eastern side of

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the building at LOC 2D (Figure 3), and three samples will be collected along the western side of the building at LOC 2E (Figure 5) to delineate the vertical extent of PCB-affected media. If the concentrations of PCBs in the vertical confirmation samples are above the FDEP R-SCTL, then the excavation will extend to the water table (approximately 7.0 ft BLS).

The excavation will extend up to the side of the Headquarters building, and horizontal confirmation samples (soil and/or concrete) will be collected at both LOC 2D and LOC 2E to confirm that concrete footings are not affected with PCBs at concentrations above screening criteria and PCB-affected media does not extend beneath the building. Six samples will be collected along the eastern side of the building at LOC 2D (Figure 3), and six additional samples will be collected along the western side of the building at LOC 2E (Figure 5) to delineate the extent of PCB-affected media (e.g. concrete building footings and/or soil). The horizontal confirmation samples will be collected adjacent to soil samples with previous exceedances and from the depth interval with the highest detected PCB concentration in the previous sample. The location and depth of the confirmation samples are summarized below.

Horizontal Confirmation Samples at LOC 2D: Adjacent to SB0081 from 0 to 0.5 ft BLS; adjacent to SB0073 from 1.5 to 2.0 ft BLS; adjacent to SB0021 from 1.0-2.0 ft BLS; adjacent to SB0022 from 1.5 to 2.0 ft BLS; adjacent to SB0039 from 1.5 to 2.0 ft BLS; and adjacent to SB0086 from 0.5 to 1.0 ft BLS (Figure 3).

Vertical Confirmation Samples at LOC 2D: SB0073, SB0021, SB0022, and SB0039 from 4.0 to 5.0 ft BLS (Figure 3).

Horizontal Confirmation Samples at LOC 2E: Adjacent to SB0041 from 2.0 to 3.0 ft BLS; adjacent to SB0030 from 0 to 0.5 ft BLS; adjacent to SB0075 from 0 to 0.5 ft BLS; adjacent to SB0029 from 0 to 0.5 ft BLS; adjacent to SB0044 from 0.5 to 2.0 ft BLS; and adjacent to SB0065 from 0.5 to 1.0 ft BLS (Figure 5).

Vertical Confirmation Samples at LOC 2E: SB0041, SB0030, and SB0044 from 4.0 to 5.0 ft BLS (Figure 5).

10. Will shoring or dewatering be required? If so, describe. No shoring or dewatering will be required.

11. Are there any special decontamination requirements? If so, describe. Decontamination fluids associated with the excavation of media with PCB concentrations greater than TSCA levels shall be segregated from decontamination fluids associated with the excavation of media with non-TSCA PCB concentrations. Therefore, two separate decontamination areas shall be

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established. The laboratory method used to characterize the decontamination fluids and disposal methods are discussed in #15. Decontamination fluids shall be collected and containerized as investigation-derived waste (IDW). IDW generated from decontamination procedures will be disposed of by NASA as industrial wastewater in accordance with KSC waste-management practices.

According to the Generic Work Plan for PCB-Contaminated Sites, equipment that comes into contact with PCB-affected media from a liquid release shall be decontaminated by washing with water. Visible removal of all potentially contaminated material shall be the initial decontamination standard. One wipe sample will be collected from the part of the equipment that has the most waste contact (typically the bucket) to verify that cleanup level is met.

Waste Handling and Disposal

12. How will the excavated soil be stored prior to disposal?

Drums Roll-offs Other (describe): Media excavated from each area will be direct-loaded into trucks or roll-off containers. Roll-offs will be used if it is necessary to minimize risks and eliminate the potential for construction staff to be exposed to stockpiled soil. Roll-off containers will also be used if excavated media needs to be moved immediately outside the construction zone.

With prior NASA approval, excavated media may be stockpiled on site and subsequently loaded into trucks or roll-off containers. If media are stockpiled, the material shall be staged in a manner to prevent runoff.

Each truck or roll-off container of non-TSCA media will be weighed, manifested, and transported to an approved Resource Conservation and Recovery Act (RCRA) Subtitle D landfill. Each truck or roll-off container of TSCA media will be weighed, manifested, and transported to a chemical waste landfill permitted under 761.75, TSCA incinerator, or an approved Subtitle C landfill.

13. How will miscellaneous debris and decontamination fluids be stored prior to disposal?

Drums Roll-offs Other (describe): Decontamination fluids shall be collected and containerized in drums. Expendables, such as personal protective equipment, that contacts PCB-affected media shall be packaged and disposed at a RCRA Subtitle D landfill.

14. Are there any special waste segregation requirements? If so, describe. Yes. Media and associated decontamination fluids from the areas with PCB concentrations equal to or greater than 50 mg/kg shall be segregated from the media and associated decontamination fluids from the areas with PCB concentrations less than 50 mg/kg.

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15. How will the waste be characterized for disposal? The laboratory analytical results are greater than one year old. Therefore, the disposal facility may require that waste characterization samples be collected. The analytical requirements for waste characterization samples will most likely include volatile organic compounds, semi-volatile organic compounds (including polynuclear aromatic hydrocarbons), 8 RCRA metals, and PCBs. Requirements for waste characterization shall be confirmed with the disposal facility.

According to the Generic Work Plan for PCB-Contaminated Sites, if the PCB concentrations in the source is equal to or greater than 50 mg/kg, then the concentrations of PCBs in the liquid waste (decontamination fluids) shall be analyzed for proper disposal using EPA Method 8082 for PCBs. Disposal shall be based on PCB concentrations in the liquid waste and in accordance with Table 4-1 and Table 4-2 of the *Generic Work Plan for the Investigation and Cleanup of PCB Contaminated Sites*.

According to the Generic Work Plan for PCB-Contaminated Sites, if the PCB concentration in the source is less than 50 mg/kg, then the concentration of PCBs in the liquid waste (decontamination fluids) is not applicable for waste characterization, and the decontamination fluids shall be disposed in accordance with the NASA-KSC waste-management practices. Disposal shall be in accordance with Table 4-1 and Table 4-2 of the *Generic Work Plan for the Investigation and Cleanup of PCB Contaminated Sites*.

16. Are there any special fill characterization or compaction requirements? If so, describe. Imported fill material shall comply with FDEP's *Revised Guidance for Sampling of Backfill for Sites Undergoing Excavation*, dated 4 June 2009. Imported backfill material shall be placed in 12-inch lifts and compacted to 95% of the Modified Proctor Value (ASTM Method D1557). Nuclear density testing shall be completed at a minimum of one test per LOC per 12-inch lift in the upper 4 feet of the excavation.

Other Issues

17. Are there any other specific issues, including health and safety that need to be considered? If so, describe.

General Issues

An Environmental Checklist (KSC Form 21-608) shall be completed prior to IM activities.

An Excavation Permit Request shall be prepared. Once approved, the contractor shall arrange for and attend utility marking.

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It is assumed that excavation activities will be conducted after the electrical equipment has been de-energized and removed from the site. Therefore, the excavation will be completed using conventional techniques (i.e. excavator), and coordination with ISC/High Voltage Shop and lock-out/tag out procedures will not be required.

The contractor shall prepare a site-specific Health and Safety Plan.

The KSC project manager and contractor shall meet with construction personnel to discuss the project approach, coordinate activities, and establish work zones.

The contractor shall submit waste profile information and disposal authorization request to the disposal facility(ies), following review and approval by the KSC project manager.

The contractor shall establish work site controls by posting appropriate notices and the excavation permit. The contractor shall use barricades or fencing, as appropriate, to demarcate exclusion zones and shall mark items within the work zone that should be protected.

The contractor shall prepare contaminated material staging/packaging areas and ensure the availability of appropriate waste storage containers, packaging, and labels. The KSC-approved drum types for the storage of IDW are 55-gallon capacity, Department of Transportation approved UN1A1/Y1.4/100 (liquids) and/or UN1A2/Y1.4/100 (solids) drums or better. Only rust-free and non-dented drums shall be used; reconditioned drums shall not be used.

If present, asphalt and concrete surfaces shall be saw-cut prior to excavation/removal.

The excavation coordinates are based on physical measurements from known locations (e.g. corner of transformer pad) because of inconsistencies with Global Positioning System coordinates caused by interference from the nearby building. Prior to building demolition, the excavation area shall be marked using physical measurements based on the site features and surveyed by a professional surveyor. Following building demolition and prior to IM activities, the excavation areas shall be remarked by a professional surveyor.

Vehicles being used for transporting wastes shall be checked for apparent soundness and suitability. Each vehicle shall be logged in and out of the site by the waste coordinator or a designee. After loading, the exterior of each vehicle shall be checked to verify decontamination was completed, the tarps are down and secure, proper placards posted, and no visible evidence of spillage observed. The original and appropriate copies of the manifest(s), signed by a Government Representative and the driver, shall be given to the driver prior to leaving the site.

Each manifest shall be assigned a unique number. Manifests shall be completed for signature by a Government Representative for each waste shipment.

The off-site disposal facility shall complete disposal and/or treatment of the waste in accordance with its federal, state, and local permits. The original manifests, completed by the facility, and

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Certificate(s) of Disposal shall be returned to the KSC project manager within 45 days. Documentation relative to waste transportation and disposal shall be supplied to the KSC project manager.

A method to suppress dust and particulates shall be available on site during excavation activities.

During preliminary discussions, NASA construction personnel indicated that the exaction areas only need to be backfilled to grade with clean fill and compacted. No additional site restoration (e.g. concrete, asphalt, gravel, etc.) were requested by NASA construction personnel.

18. Work Schedule. A detailed work schedule shall be prepared prior to the implementation of the proposed IM activities.

INTERIM MEASURES WORK PLAN FOR PCB-CONTAMINATED SITES

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**Table 1. Coordinates of Soil Boring Locations
at the Boundaries and within the Excavation Areas
KHQA IMWP**

Location ID	Easting	Northing	Type
LOC 2D			
CT0001	234133.76	464330.19	CT
SB0020	234132.01	464335.17	SB
SB0021	234134.40	464330.24	SB
SB0022	234134.34	464322.70	SB
SB0023	234128.33	464322.40	SB
SB0024	234128.35	464329.91	SB
SB0039	234134.26	464319.77	SB
SB0040	234130.63	464319.80	SB
SB0052	234129.70	464335.18	SB
SB0053	234131.94	464338.57	SB
SB0055	234134.72	464338.32	SB
SB0056	234129.68	464338.35	SB
SB0057/PV0001/RB0001	234126.72	464335.09	SB/PV/RB
SB0058/PV0002/RB0002	234127.61	464319.84	SB/PV/RB
SB0059	234131.38	464317.59	SB
SB0060	234134.22	464316.95	SB
SB0072	234132.28	464336.59	SB
SB0073	234134.39	464335.23	SB
SB0074	234132.21	464334.16	SB
SB0081	234134.72	464341.02	SB
SB0082	234129.06	464340.85	SB
SB0083	234126.65	464338.31	SB
SB0084	234131.81	464331.15	SB
SB0085	234131.26	464323.05	SB
SB0086	234134.52	464315.05	SB
SB0094	234134.72	464342.70	SB
SB0095	234130.92	464342.62	SB
SB0096	234134.72	464345.92	SB
SB0097	234132.59	464310.79	SB
SB0098	234130.62	464315.09	SB
SB0099	234132.89	464306.88	SB
SB0100	234130.56	464312.21	SB
SB0101	234126.98	464315.03	SB
SB0144/CT0035	234132.00	464335.05	SB/CT

**Table 1. Coordinates of Soil Boring Locations
at the Boundaries and within the Excavation Areas
KHQA IMWP**

Location ID	Easting	Northing	Type
LOC 2E			
CT0002	234217.18	464328.85	CT
CT0006	234219.79	464327.43	CT
CT0007	234217.16	464327.39	CT
CT0008	234217.07	464330.49	CT
CT0009	234217.60	464333.42	CT
CT0010	234221.59	464327.38	CT
CT0011	234216.56	464325.24	CT
CT0014	234216.94	464328.83	CT
CT0015	234217.18	464329.83	CT
CT0016	234221.57	464324.87	CT
CT0017	234220.62	464322.60	CT
CT0018	234221.67	464321.11	CT
CT0019	234217.59	464328.79	CT
CT0025	234222.47	464349.24	CT
CT0027	234221.99	464338.03	CT
CT0029	234222.63	464334.70	CT
CT0034	234222.06	464324.89	CT
PV0008	234222.97	464324.95	PV
PV0009	234223.00	464321.08	PV
SB0026	234223.37	464338.35	SB
SB0027	234223.39	464335.63	SB
SB0028	234223.12	464329.84	SB
SB0029	234216.67	464328.83	SB
SB0030	234216.59	464335.92	SB
SB0031	234216.69	464338.82	SB
SB0041	234216.80	464342.91	SB
SB0042	234219.86	464342.69	SB
SB0043	234220.39	464327.44	SB
SB0044	234216.72	464327.29	SB
SB0061	234216.69	464346.73	SB
SB0062	234219.71	464339.04	SB
SB0063	234221.20	464335.82	SB
SB0064/CT0005	234219.75	464330.49	SB/CT
SB0065	234216.70	464324.13	SB

**Table 1. Coordinates of Soil Boring Locations
at the Boundaries and within the Excavation Areas
KHQA IMWP**

Location ID	Easting	Northing	Type
LOC 2E (Continued)			
SB0075	234216.65	464330.49	SB
SB0076	234217.50	464328.83	SB
SB0087	234216.64	464333.42	SB
SB0088/CT0012	234220.63	464324.88	SB/CT
SB0089/CT0013	234216.64	464321.17	SB/CT
SB0116/PV0010/RB0010	234223.84	464318.06	SB/PV/RB
SB0117/PV0011/RB0011	234226.16	464321.39	SB/PV/RB
SB0118/PV0012/RB0012	234225.91	464324.95	SB/PV/RB
SB0119/PV0013/RB0013	234222.95	464328.09	SB/PV/RB
SB0121/CT0020	234218.67	464321.14	SB/CT
SB0122/PV0014/RB0014	234222.70	464331.17	SB/PV/RB
SB0123/PV0015/RB0015	234226.03	464328.06	SB/PV/RB
SB0126/PV0018/RB0018	234226.80	464318.09	SB/PV/RB
SB0127/PV0019/RB0019	234224.00	464314.55	SB/PV/RB
SB0128/CT0022	234218.51	464318.02	SB/CT
SB0129/CT0021	234221.56	464318.02	SB/CT
SB0130/CT0023	234218.47	464314.62	SB/CT
SB0131/CT0024	234221.56	464314.52	SB/CT
SB0133/PV0020/RB0020	234222.44	464345.68	SB/PV/RB
SB0135/PV0022/RB0022	234223.04	464338.38	SB/PV/RB

Notes:

1. Easting and Northing Coordinates are presented in US State Plane North America Datum of 1983, Florida East, meters.
2. The locations/coordinates are based on physical measurements from known locations (e.g. corner of transformer pad) because of inconsistencies with Global Positioning System coordinates caused by interference from the nearby building. Prior to building demolition, the excavation area shall be marked using physical measurements based on the site features and surveyed by a professional surveyor. Following building demolition and prior to IM activities, the excavation areas shall be remarked by a professional surveyor.
3. Sample locations have prefix "KHQA-".
4. SB = soil boring.
5. CT = concrete.
6. PV = pavement.
7. RB = roadbase.

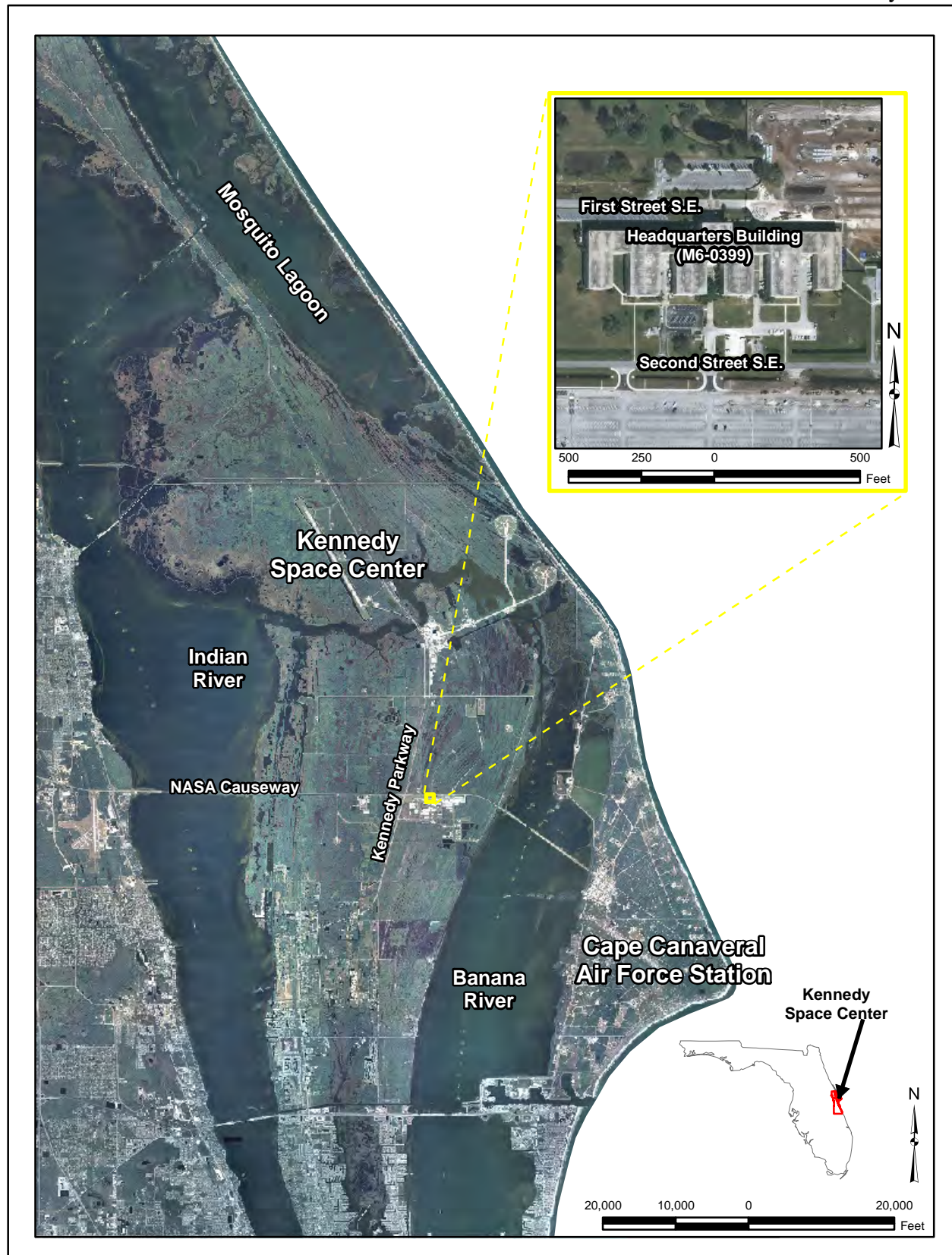



Figure 1
Kennedy Space Center Headquarters Building Area Site Location Map



Figure 2
Site Map and Locations of Concern

Legend

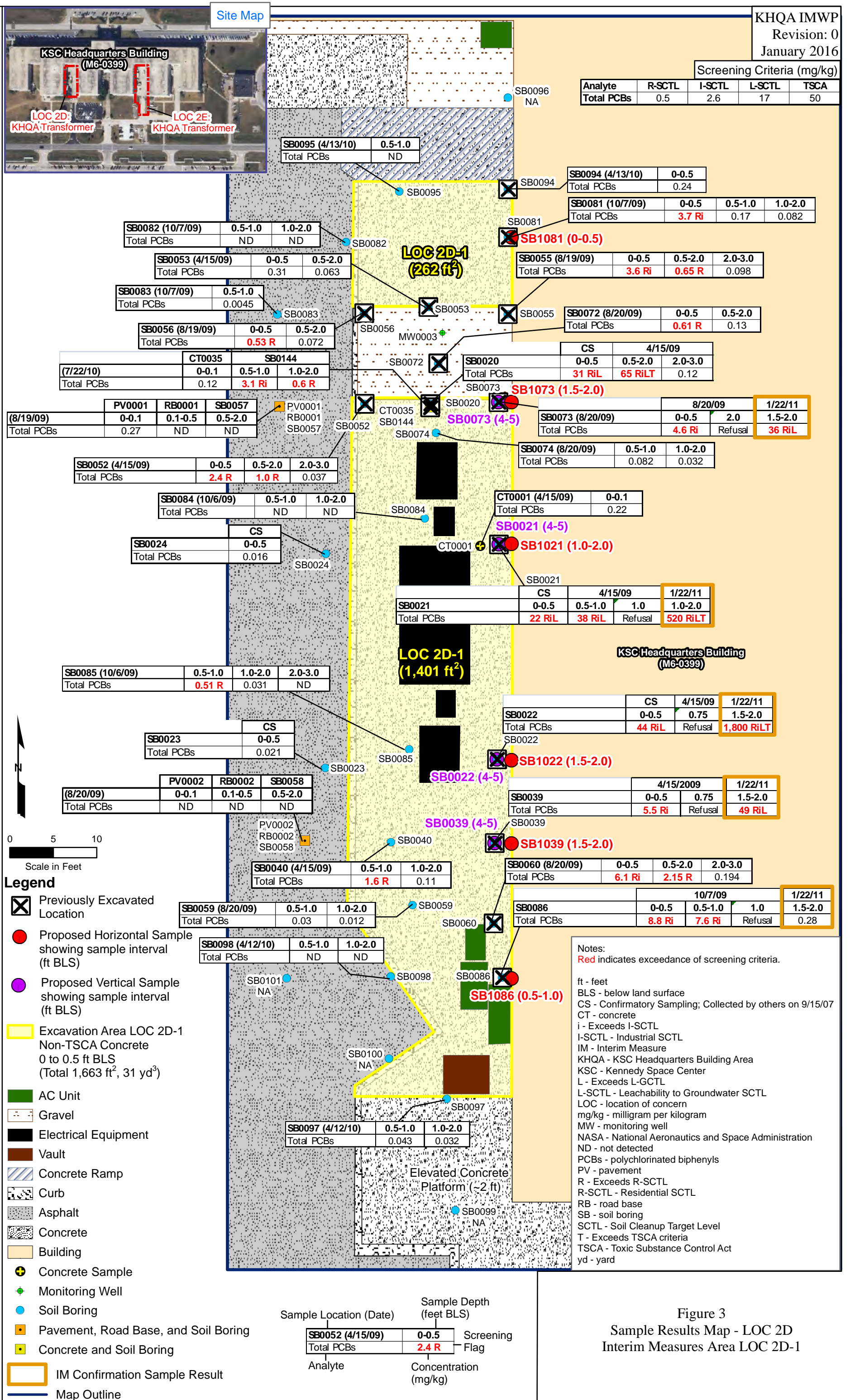
 Locations of Concern (LOC)

Notes:

1. KSC indicates Kennedy Space Center.
2. KHQA indicates KSC Headquarters Building Area.
3. 2009 Aerial Imagery Source: Florida Department of Transportation Surveying and Mapping Office.

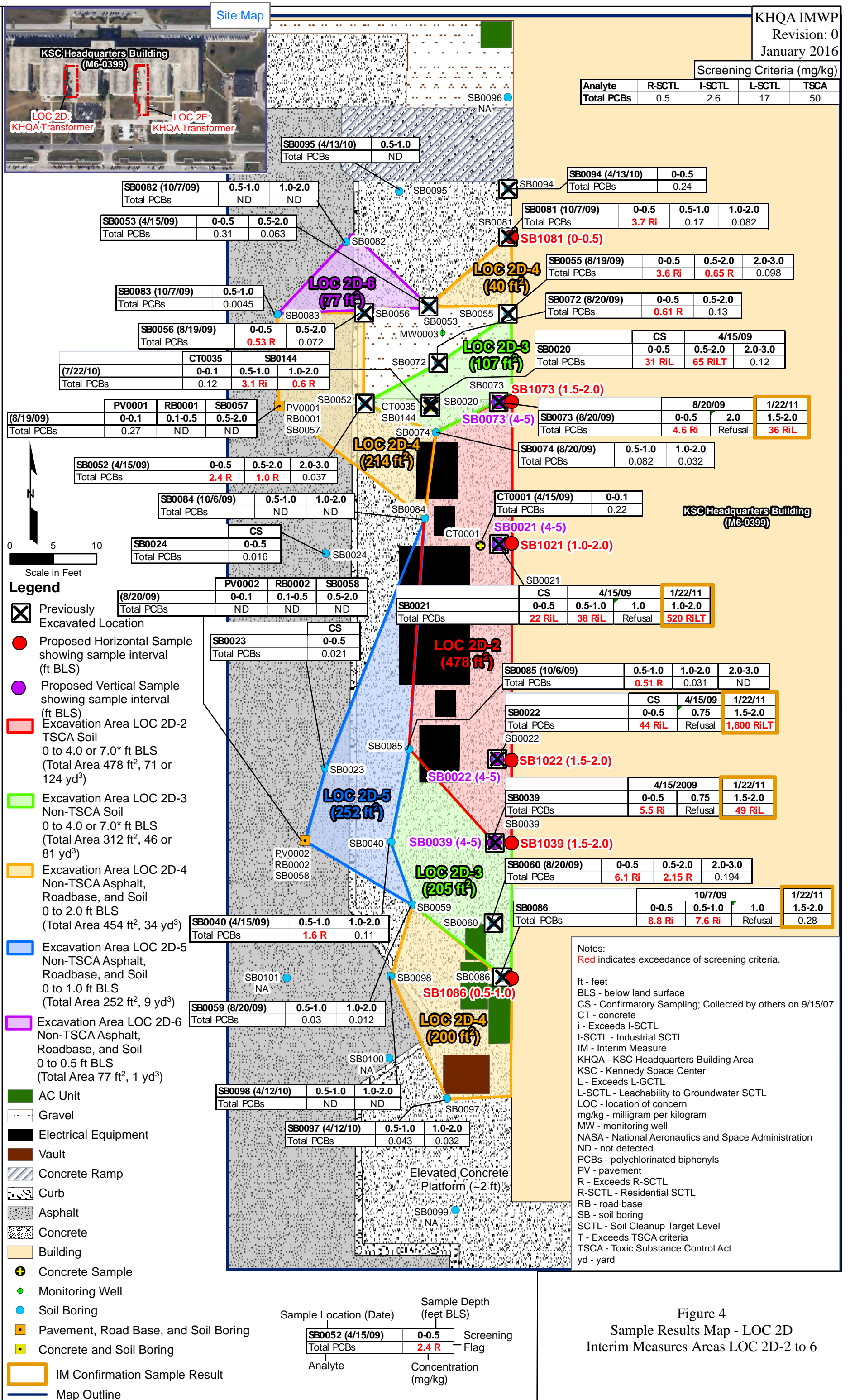
Screening Criteria (mg/kg)

Analyte	R-SCTL	I-SCTL	L-SCTL	TSCA
Total PCBs	0.5	2.6	17	50



Screening Criteria (mg/kg)

Analyte	R-SCTL	I-SCTL	L-SCTL	TSCA
Total PCBs	0.5	2.6	17	50



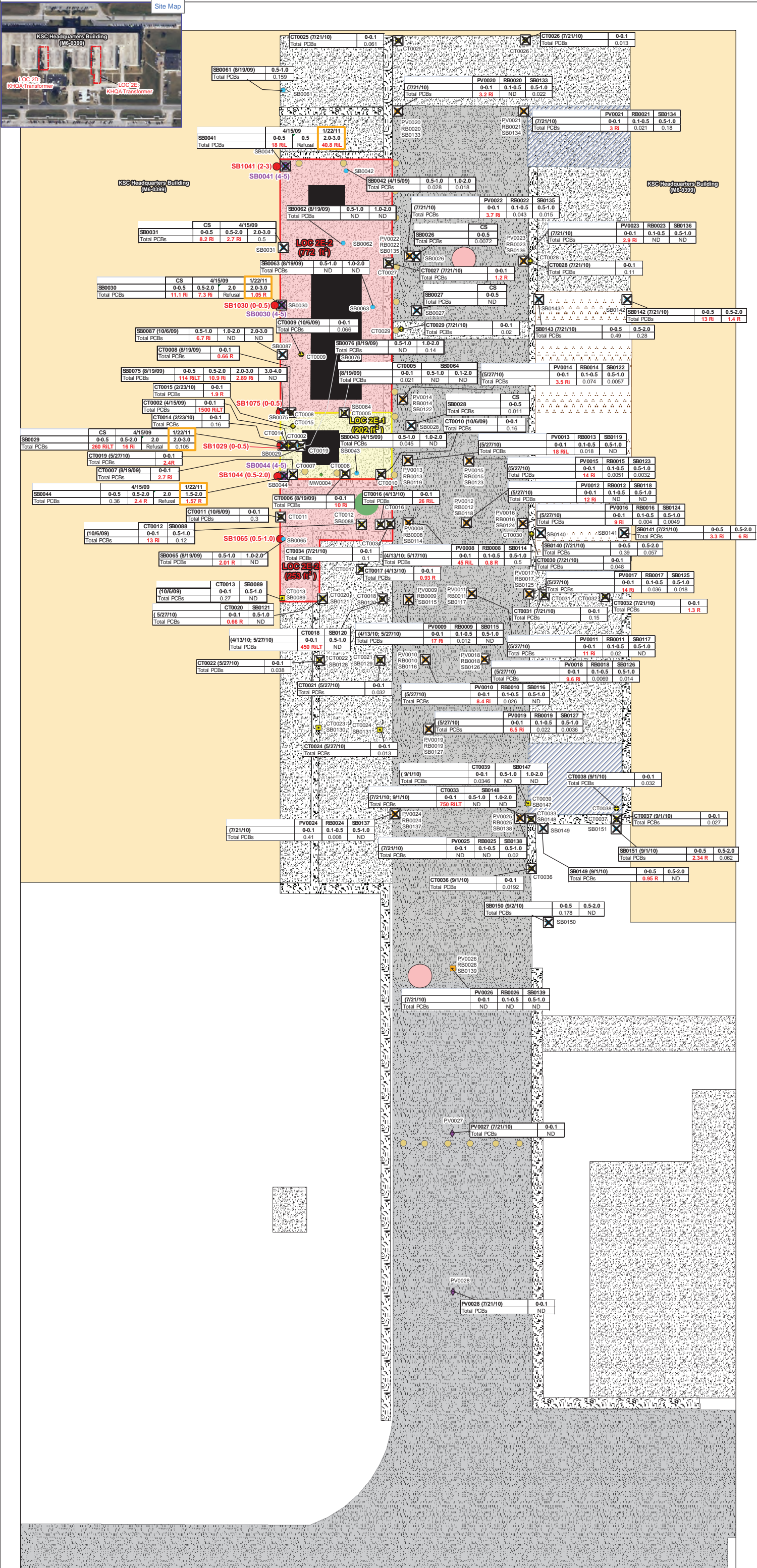
Analyte	Screening Criteria (mg/kg)			
	R-SCTL	I-SCTL	L-SCTL	TSCA
Total PCBs	0.5	2.6	17	50



Legend

- ☒ Previously Excavated Location
- Proposed Horizontal Sample showing sample interval (ft BLS)
- Proposed Vertical Sample showing sample interval (ft BLS)
- Excavation Area 1 - TSCA Concrete
0 to 0.5 ft BLS
(Total 202 ft², 4 yd³)
- Excavation Area 2, - Non-TSCA Concrete
0 to 0.5 ft BLS
(Total 1,025 ft², 19 yd³)
- Concrete Sample
- Soil Boring
- Pavement Sample
- Pavement, Road Base, and Soil Boring
- Concrete Sample and Soil Boring
- Monitoring Well
- Bollard
- Electric Manhole
- Storm Sewer Manhole
- Electrical Equipment
- Concrete Ramp
- Concrete
- Building
- Asphalt
- IM Confirmation Sample Result

Sample Location (Date)	Sample Depth (feet BLS)	Screening Flag
CT0006 (8/19/09)	0-0.1	10 R
Analyte	Concentration (mg/kg)	



Notes
Concentrations in milligrams per kilogram (mg/kg).
Red indicates exceedance of SCTL criteria.

ft - feet
BLS - below land surface
CS - Confirmatory Sampling; Collected by others on 9/15/07
CT - concrete
KHOA - KSC Headquarters Building Area
KSC - Kennedy Space Center
I - Exceeds I-SCTL
IMWP - Interim Measure Work Plan
I-SCTL - Industrial SCTL
L - Exceeds L-SCTL
L-GCTL - Leachability to Groundwater Cleanup Target Level
LOC - location of concern
mg/kg - milligrams per kilogram
MW - monitoring well
NASA - National Aeronautics and Space Administration
ND - not detected
PCBs - Polychlorinated Biphenyls
PV - pavement
R - Exceeds R-SCTL
R-SCTL - Residential SCTL
RB - road base
SB - soil boring
SCTL - Soil Cleanup Target Level
T - Exceeds TSCA criteria
TSCA - Toxic Substance Control Act
yd - yard

Figure 5
Sample Results Map - LOC 2E
Interim Measures Areas LOC 2E-1 and 2

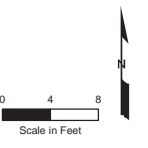
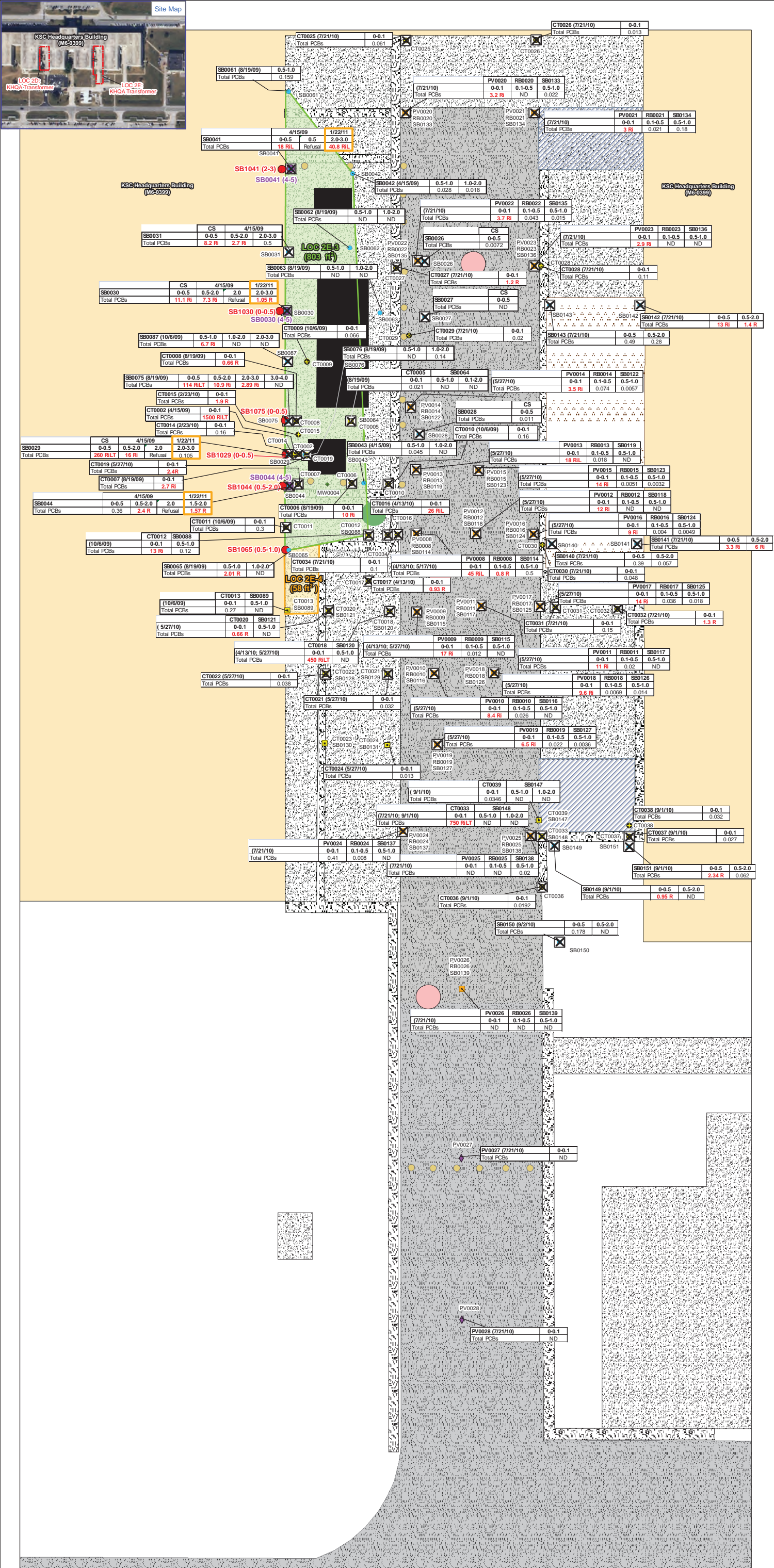
Analyte	Screening Criteria (mg/kg)			
	R-SCTL	I-SCTL	L-SCTL	TSCA
Total PCBs	0.5	2.6	17	50



Legend

- ☒ Previously Excavated Location
- Proposed Horizontal Sample showing sample interval (ft BLS)
- Proposed Vertical Sample showing sample interval (ft BLS)
- Excavation Area LOC 2E-3 - Non-TSCA Soil
0 to 4.0 or 7.0' ft BLS
(Total 803 ft², 118 or 208 yd³)
- Excavation Area LOC 2E-4 - Non-TSCA Soil
0 to 1.0 ft BLS
(Total 58 ft², 2 yd³)
- Concrete Sample
- Soil Boring
- ◆ Pavement Sample
- Pavement, Road Base, and Soil Boring
- Concrete Sample and Soil Boring
- Monitoring Well
- Bollard
- Curb
- Electric Manhole
- Storm Sewer Manhole
- Electrical Equipment
- Concrete Ramp
- Concrete
- Building
- Asphalt
- IM Confirmation Sample Result

Sample Location (Date)	Sample Depth (feet BLS)	Screening Flag
CT0006 (8/19/09)	0-0.1	10 R
Analyte	Concentration (mg/kg)	

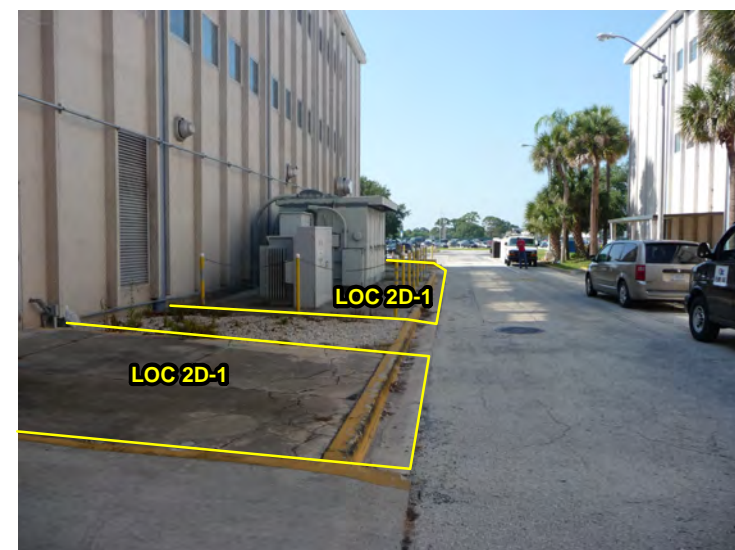
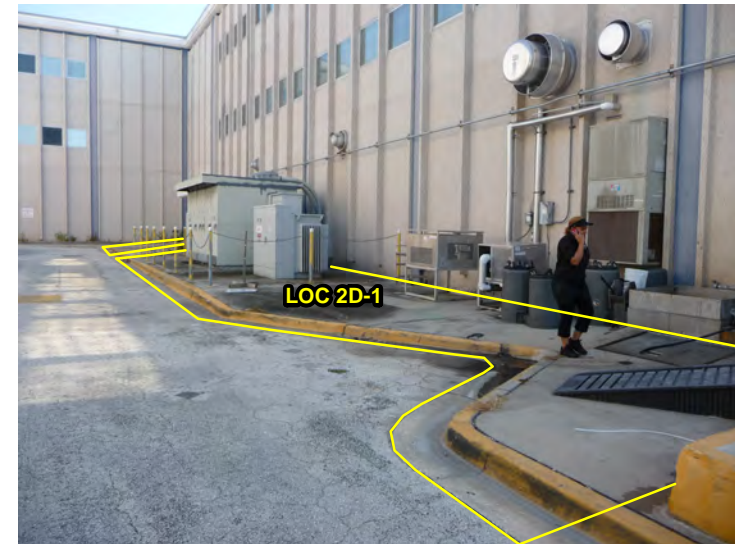
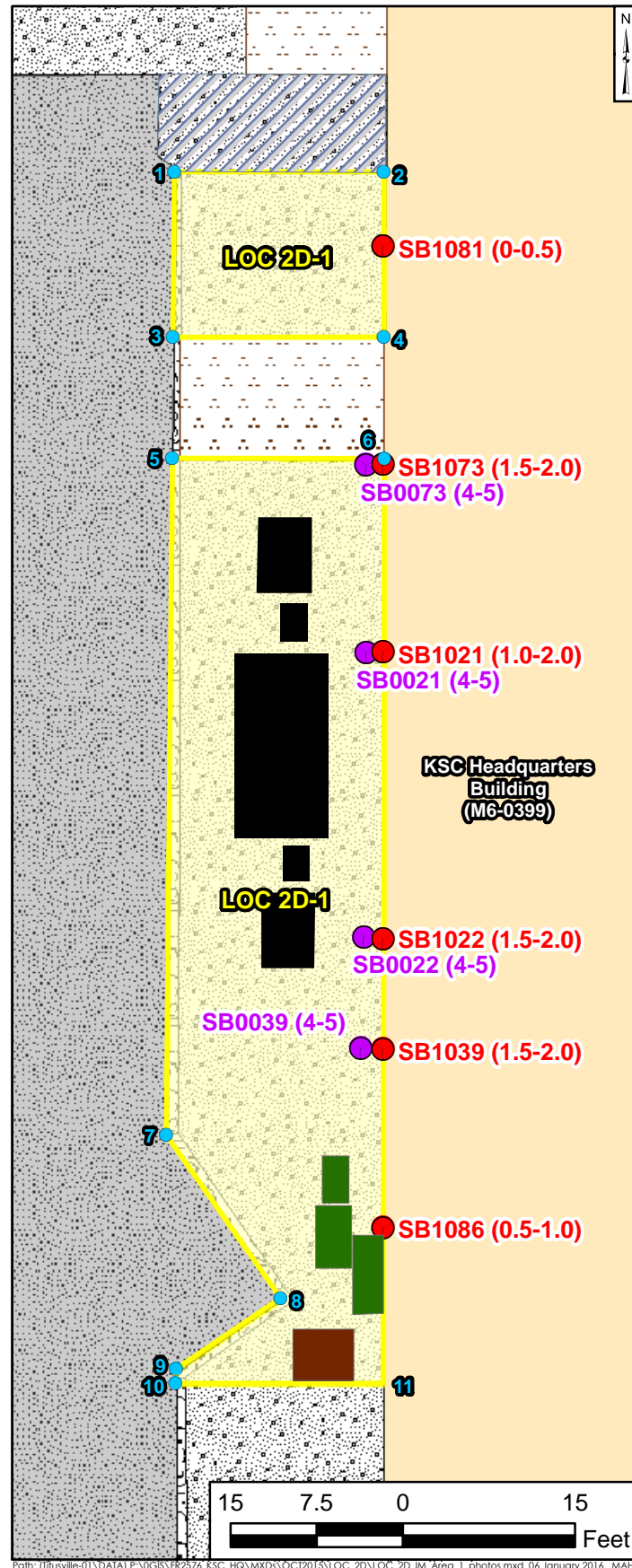


Notes
Concentrations in milligrams per kilogram (mg/kg).
Red indicates exceedance of SCTL criteria.

ft - feet
BLS - below land surface
CS - Confirmatory Sampling; Collected by others on 9/15/07
CT - concrete
KHQA - KSC Headquarters Building Area
KSC - Kennedy Space Center
I - Exceeds I-SCTL
IMWP - Interim Measure Work Plan
I-SCTL - Industrial SCTL
L - Exceeds L-GCTL
L-GCTL - Leachability to Groundwater Cleanup Target Level
LOC - location of concern
mg/kg - milligrams per kilogram
MW - monitoring well
NASA - National Aeronautics and Space Administration
ND - not detected
PCBs - Polychlorinated Biphenyls
PV - pavement
R - Exceeds R-SCTL
R-SCTL - Residential SCTL
RB - road base
SB - soil boring
SCTL - Soil Cleanup Target Level
T - Exceeds TSCA criteria
TSCA - Toxic Substance Control Act
yd³ - yard

* PCB-affected media was left in place following previous IM activities due to subsurface obstructions. Vertical confirmation samples shall be collected from 4.0 to 5.0 feet (ft) below land surface (BLS) to confirm that PCB-affected media is removed during implementation of this IMWP. If the concentrations of PCBs in the vertical confirmation samples are below the FDEP R-SCTL, the excavation will only extend to 4.0 ft BLS. If the concentrations of PCBs in the vertical confirmation samples are above the FDEP R-SCTL, then the excavation will extend to the water table (approximately 7.0 ft BLS).

Figure 6
Sample Results Map - LOC 2E
Interim Measure Areas LOC 2E-3 and 4



Excavation Boundary Point ID	Easting	Northing
1	234129.31	464342.98
2	234134.86	464342.98
3	234129.27	464338.59
4	234134.86	464338.61
5	234129.26	464335.39
6	234134.88	464335.38
7	234129.10	464317.47
8	234132.13	464313.14
9	234129.36	464311.26
10	234129.34	464310.88
11	234134.85	464310.88

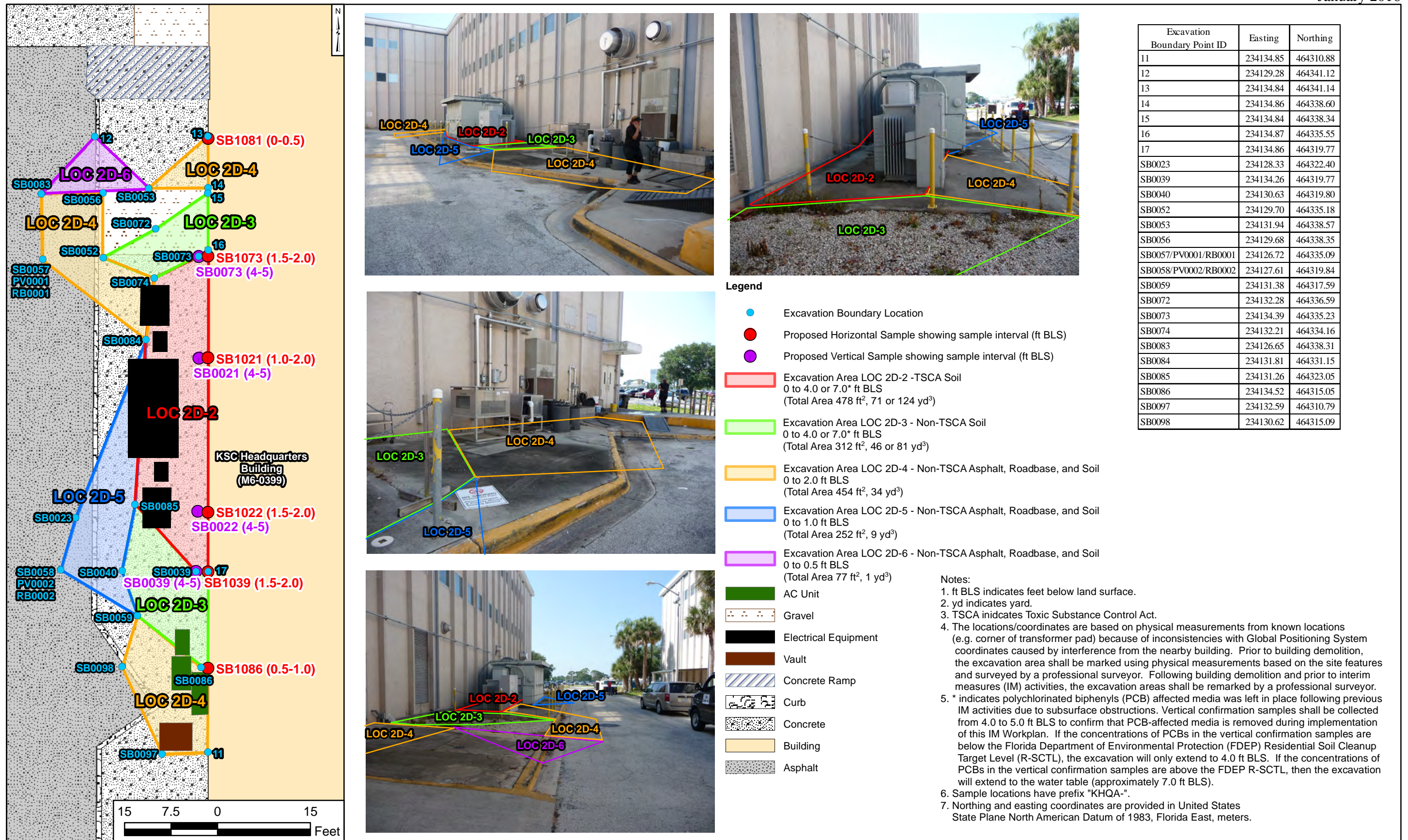
Legend

- Excavation Boundary Location
- Proposed Horizontal Sample showing sample interval (ft BLS)
- Proposed Vertical Sample showing sample interval (ft BLS)
- Excavation Area LOC 2D-1 -Non-TSCA Concrete 0 to 0.5 ft BLS (Total 1,663 ft², 31 yd³)
- AC Unit
- Gravel
- Electrical Equipment
- Vault
- Concrete Ramp
- Curb
- Asphalt
- Concrete
- Building

- Notes:**
1. ft BLS indicates feet below land surface.
 2. yd indicates yard.
 3. TSCA indicates Toxic Substance Control Act.
 4. The coordinates are based on physical measurements from known locations (e.g. corner of transformer pad) because of inconsistencies with Global Positioning System coordinates caused by interference from the nearby building. Prior to building demolition, the excavation area shall be marked using physical measurements based on the site features and surveyed by a professional surveyor. Following building demolition and prior to interim measures activities, the excavation areas shall be remarked by a professional surveyor.
 5. Sample locations have prefix "KHQA-".
 6. Northing and easting coordinates are provided in United States State Plane North American Datum of 1983, Florida East, meters.

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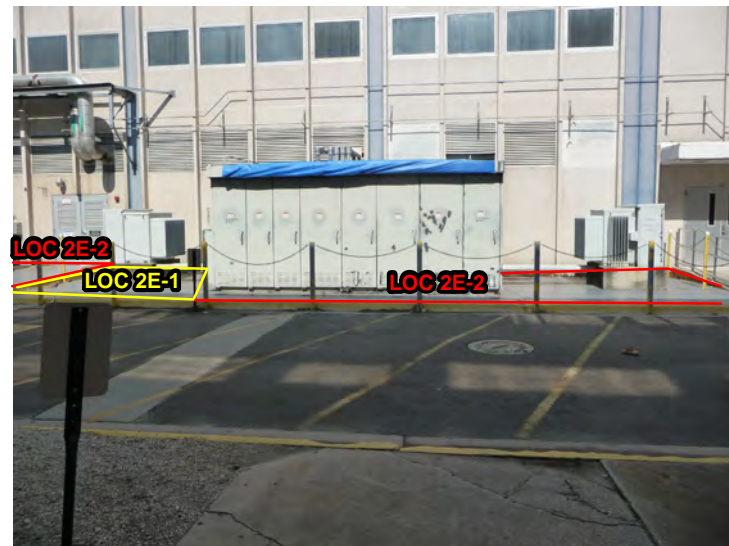
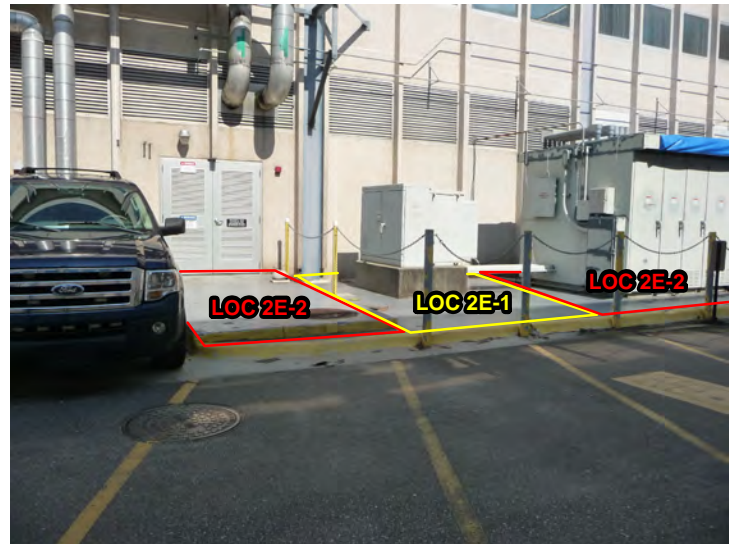
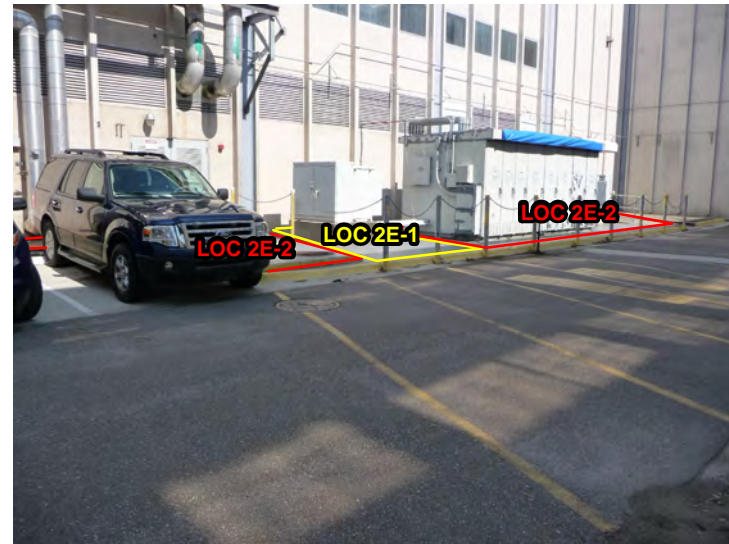
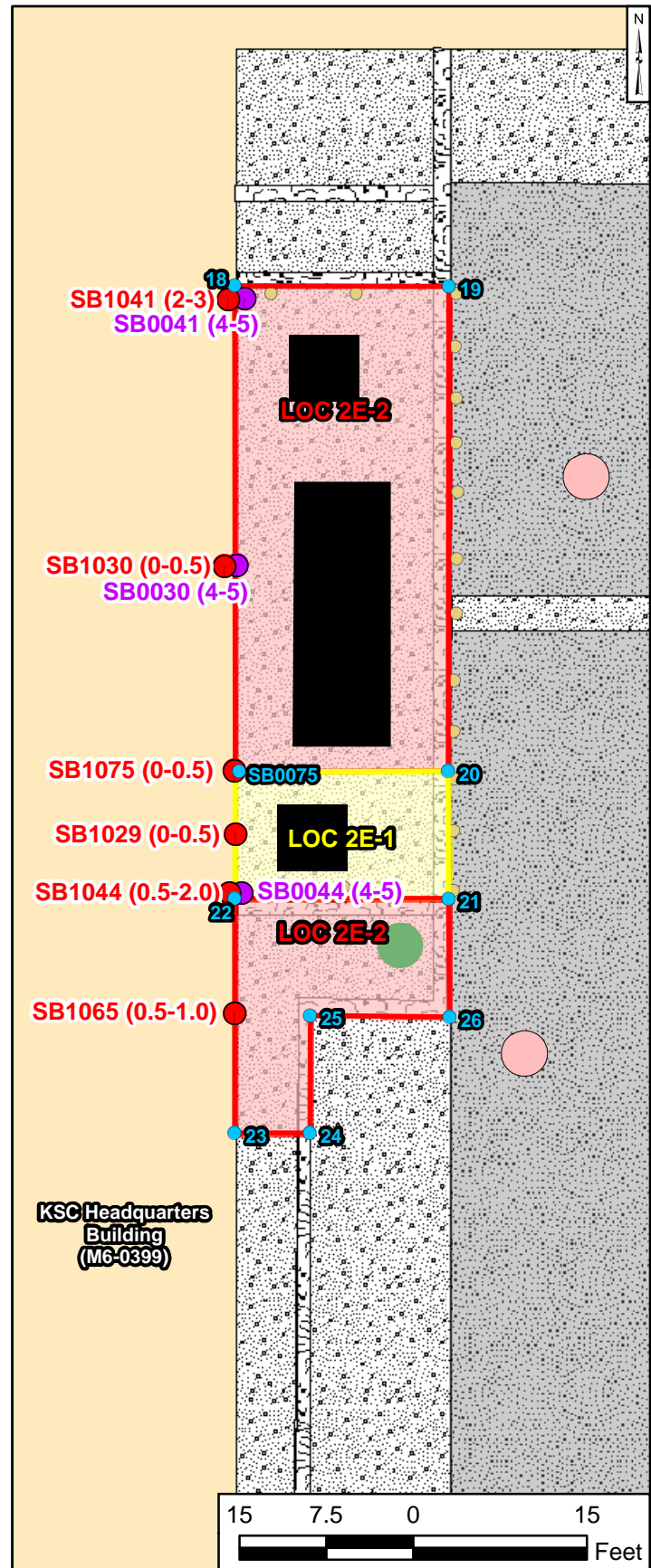
Figure 7
 Excavation Boundaries and Coordinates - Interim Measures Area LOC 2D-1



Excavation Boundary Point ID	Easting	Northing
11	234134.85	464310.88
12	234129.28	464341.12
13	234134.84	464341.14
14	234134.86	464338.60
15	234134.84	464338.34
16	234134.87	464335.55
17	234134.86	464319.77
SB0023	234128.33	464322.40
SB0039	234134.26	464319.77
SB0040	234130.63	464319.80
SB0052	234129.70	464335.18
SB0053	234131.94	464338.57
SB0056	234129.68	464338.35
SB0057/PV0001/RB0001	234126.72	464335.09
SB0058/PV0002/RB0002	234127.61	464319.84
SB0059	234131.38	464317.59
SB0072	234132.28	464336.59
SB0073	234134.39	464335.23
SB0074	234132.21	464334.16
SB0083	234126.65	464338.31
SB0084	234131.81	464331.15
SB0085	234131.26	464323.05
SB0086	234134.52	464315.05
SB0097	234132.59	464310.79
SB0098	234130.62	464315.09

Figure 8

Excavation Boundaries and Coordinates - Interim Measures Areas LOC 2D-2 to 6



Excavation Boundary Point ID	Easting	Northing
18	234216.53	464343.26
19	234222.17	464343.25
20	234222.15	464330.50
21	234222.16	464327.14
22	234216.53	464327.15
23	234216.53	464320.99
24	234218.51	464320.99
25	234218.52	464324.08
26	234222.18	464324.04
SB0075	234216.65	464330.49

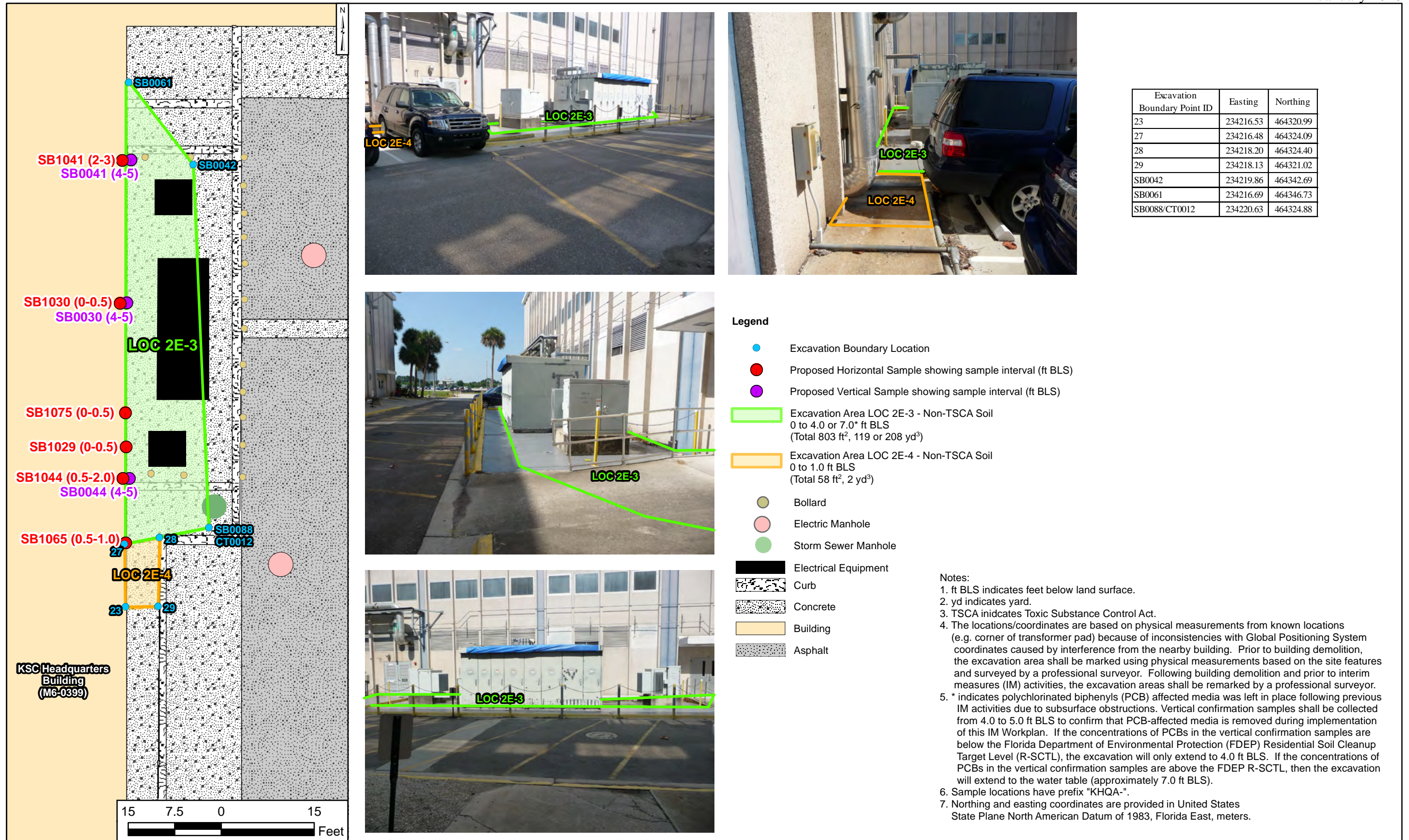
Legend

- Excavation Boundary Location
- Proposed Horizontal Sample showing sample interval (ft BLS)
- Proposed Vertical Sample showing sample interval (ft BLS)
- Excavation Area 1 - TSCA Concrete
0 to 0.5 ft BLS
(Total 202 ft², 4 yd³)
- Excavation Area 2 - Non-TSCA Concrete
0 to 0.5 ft BLS
(Total 1,025 ft², 19 yd³)
- Bollard
- Electric Manhole
- Storm Sewer Manhole
- Electrical Equipment
- Curb
- Concrete
- Building
- Asphalt

- Notes:**
1. ft BLS indicates feet below land surface.
 2. yd indicates yard.
 3. TSCA indicates Toxic Substance Control Act.
 4. The locations/coordinates are based on physical measurements from known locations (e.g. corner of transformer pad) because of inconsistencies with Global Positioning System coordinates caused by interference from the nearby building. Prior to building demolition, the excavation area shall be marked using physical measurements based on the site features and surveyed by a professional surveyor. Following building demolition and prior to interim measures activities, the excavation areas shall be remarked by a professional surveyor.
 5. Sample locations have prefix "KHQA-".
 6. Northing and easting coordinates are provided in United States State Plane North American Datum of 1983, Florida East, meters.

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Figure 9
Excavation Boundaries and Coordinates - Interim Measures Areas LOC 2E-1 and 2



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Figure 10
Excavation Boundaries and Coordinates - Interim Measures Areas LOC 2E-3 and 4