



**LAND USE CONTROL IMPLEMENTATION PLAN
KARS PARK I - LOCs 2, 7, AND 9
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER**



FACILITY: KARS Park I - LOCs 2, 7, and 9
Solid Waste Management Unit 084

CONTAMINANTS: Groundwater: LOC 2: 1,1'-Biphenyl, LOC 7: Arsenic, LOC 9: Lead

CONTROL: Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of Kennedy Athletic Recreation and Social (KARS) Park I of institutional controls that have been implemented at the site⁽¹⁾. Although there are no current unacceptable risks to human health or the environment associated with the KARS Park I site, institutional land use controls (LUCs) are necessary to prohibit the use of groundwater at the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

A human health risk assessment was completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). The chemicals of concern (COCs) detected during the RFI and subsequent investigations at concentrations exceeding Florida Department of Environmental Protection (FDEP) cleanup target levels were 1,1'-biphenyl in LOC 2 groundwater, arsenic in

LOC 7 groundwater, and lead in LOC 9 in groundwater.

SITE DESCRIPTION

KARS Park I is a recreational facility for current and past National Aeronautics and Space Administration (NASA) personnel at which 11 Locations of Concern (LOCs) were identified (Figure 1). Park amenities include picnic areas, recreational vehicle and tent camp sites, racquetball, tennis, volleyball, basketball, and shuffleboard courts, marina, horseshoe pits, fish pond, roller blade area, playgrounds, softball fields, conference/activity rooms, and retail store. The central section of the park is used mainly for camping, and the playgrounds, picnic areas, and athletic fields are located in the southern portion of the park. The northern portion of the site includes a storage area and inactive gun ranges.

Improper use, storage, and disposal of materials used for maintenance of the park resulted in contaminated media at many of the LOCs. The remaining LOCs include former shooting ranges and associated areas, and shooting activities resulted in the deposition of lead shot and target debris throughout the LOCs.

¹ This LUCIP summarizes institutional controls regarding the KARS Park I. For detailed information on the site, consult the NASA KARS Park I administrative file, which is available for review by contacting the KSC Environmental Program Office at (321) 867-8411.

SITE LOCATION

KARS Park I is located east of State Route 3 along the western shore of the Banana River and approximately 5 miles south of the KSC Industrial Area. The KARS Park I site is fenced and encompasses approximately 135 acres. LOC2, the Gun Range storage Area, is located in the southern portion of LOC 9. LOC 7, the Bonfire Area, is located in the eastern portion of the park near the camping area. LOC 9, the Gun Ranges, includes inactive Skeet, Rifle, and Pistol Ranges and a storage area.

The LOCs 2, 7, and 9 groundwater use control areas covered by this LUCIP are shown on Figures 2, 3, and 4, respectively. Coordinates of the corners of the LUC areas are provided in the U.S. State Plane Coordinate System NAD 1983, Florida East, meters.

SITE CONTAMINATION AND CONTROL

Groundwater contaminants at concentrations greater than FDEP's Groundwater Cleanup Target Levels (GCTLs) include 1,1'-biphenyl at LOC 2, arsenic at LOC 7, and lead at LOC9. 1,1'-Biphenyl at LOC 2 and lead at LOC 9 were chosen as COCs based on exceedances of GCTLs. The non-cancer hazard index (HI) associated with 1,1'-biphenyl was less than FDEP's acceptable risk level, and

risks were not estimated for lead in groundwater at LOC 9. A Preliminary Risk Evaluation showed that, assuming future use of LOC 7 groundwater for drinking water, cancer and non-cancer risks would be unacceptable. The estimated lifetime excess cancer risk and non-cancer HI for the hypothetical future resident were determined to be 9×10^{-3} and 97, respectively, which exceed FDEP's respective acceptable levels of 1.0×10^{-6} and 1. However, there is no current use of site groundwater and therefore no exposure or current risk. The past, current, and projected future land use of the KARS Park I site is recreational in nature. LUCs are required to prohibit the use of groundwater at the site, thereby preventing exposure that would result in unacceptable risks.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-9501, is available for review by contacting the KSC Environmental Program Office at (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)⁽²⁾

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.

between NASA, FDEP, and the United States Environmental Protection Agency (EPA), effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if it occurs in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUC areas at KARS Park I. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating and will be conducted by KSC's Environmental Program Office. The inspection will verify that no residential groundwater use is occurring.

REPORTING

KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCs shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated, or there is a discovery, based on analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by EPA and FDEP and implemented by modification of NASA's operating permit.

FIGURE 1 FACILITY LOCATION MAP
KARS PARK I, KENNEDY SPACE CENTER, FLORIDA

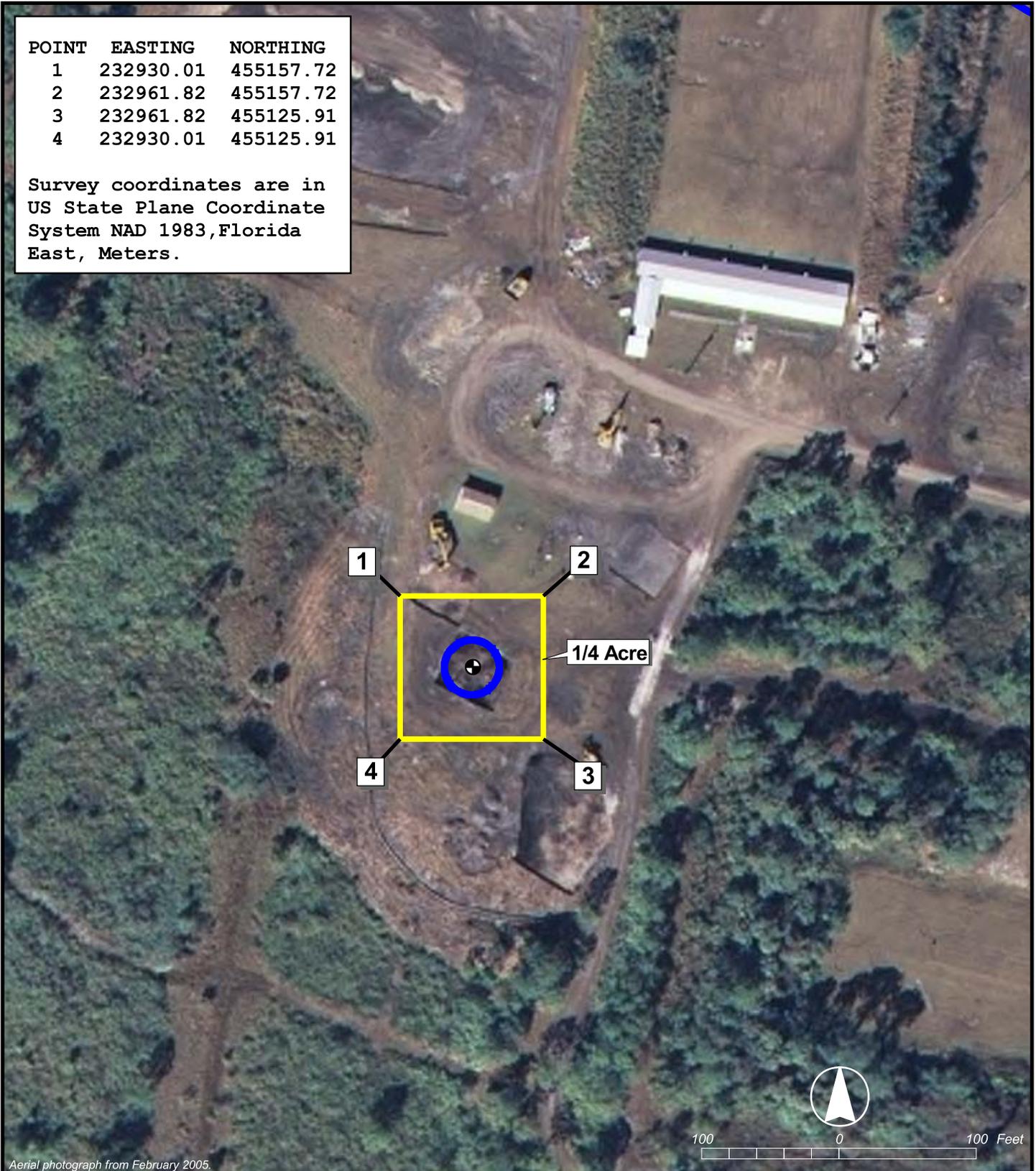


Aerial photograph from February 2005.

FIGURE 2 LOC 2 SITE MAP
 KARS PARK I, KENNEDY SPACE CENTER, FLORIDA

POINT	EASTING	NORTHING
1	232930.01	455157.72
2	232961.82	455157.72
3	232961.82	455125.91
4	232930.01	455125.91

Survey coordinates are in US State Plane Coordinate System NAD 1983, Florida East, Meters.

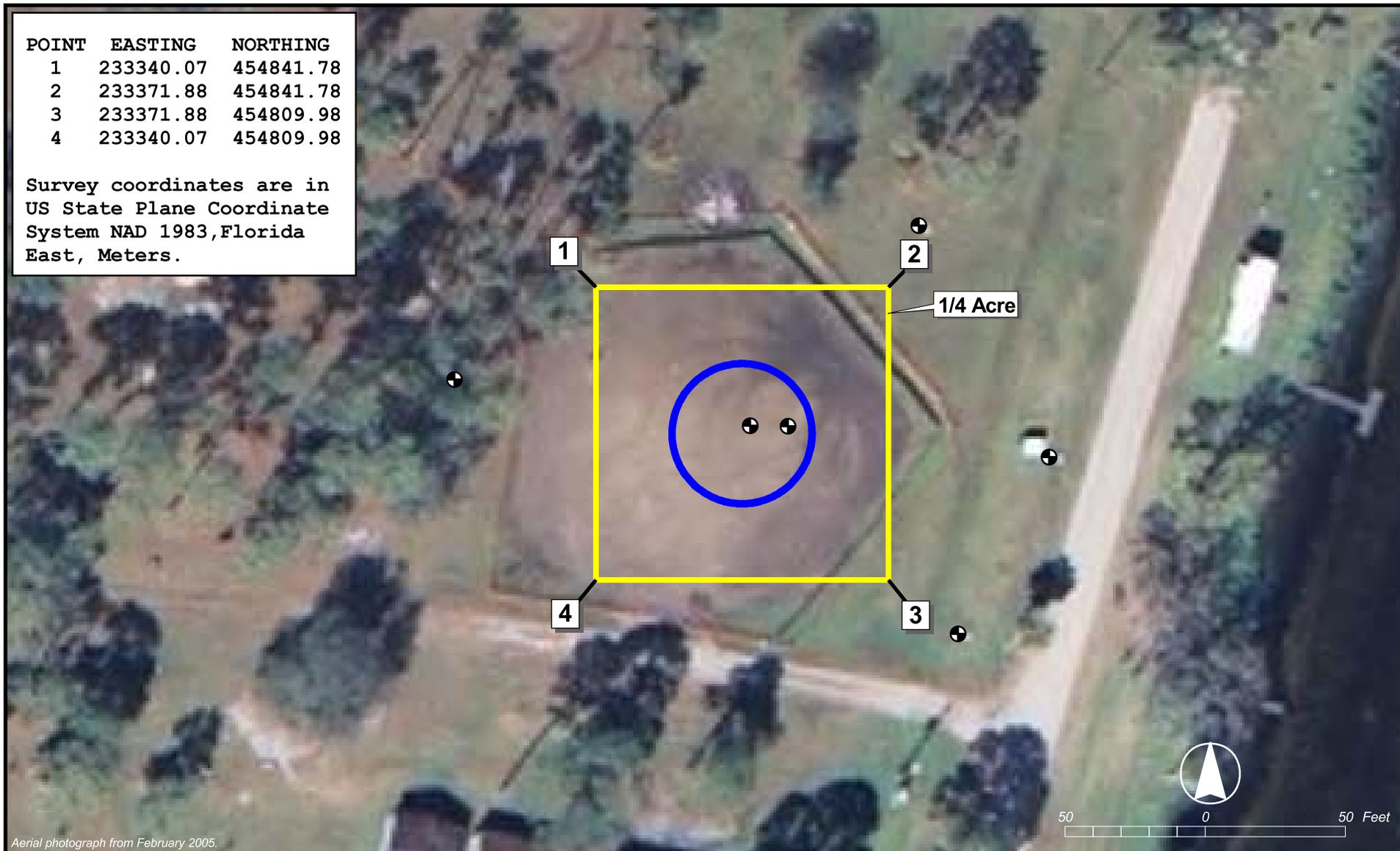


- Legend:
-  Monitoring Well
 -  1,1-Biphenyl Plume (GCTL 0.5 ug/L)
 -  Area covered by Statement of Basis and groundwater use control areas

FIGURE 3 LOC 7 SITE MAP
KARS PARK I, KENNEDY SPACE CENTER, FLORIDA

POINT	EASTING	NORTHING
1	233340.07	454841.78
2	233371.88	454841.78
3	233371.88	454809.98
4	233340.07	454809.98

Survey coordinates are in US State Plane Coordinate System NAD 1983, Florida East, Meters.

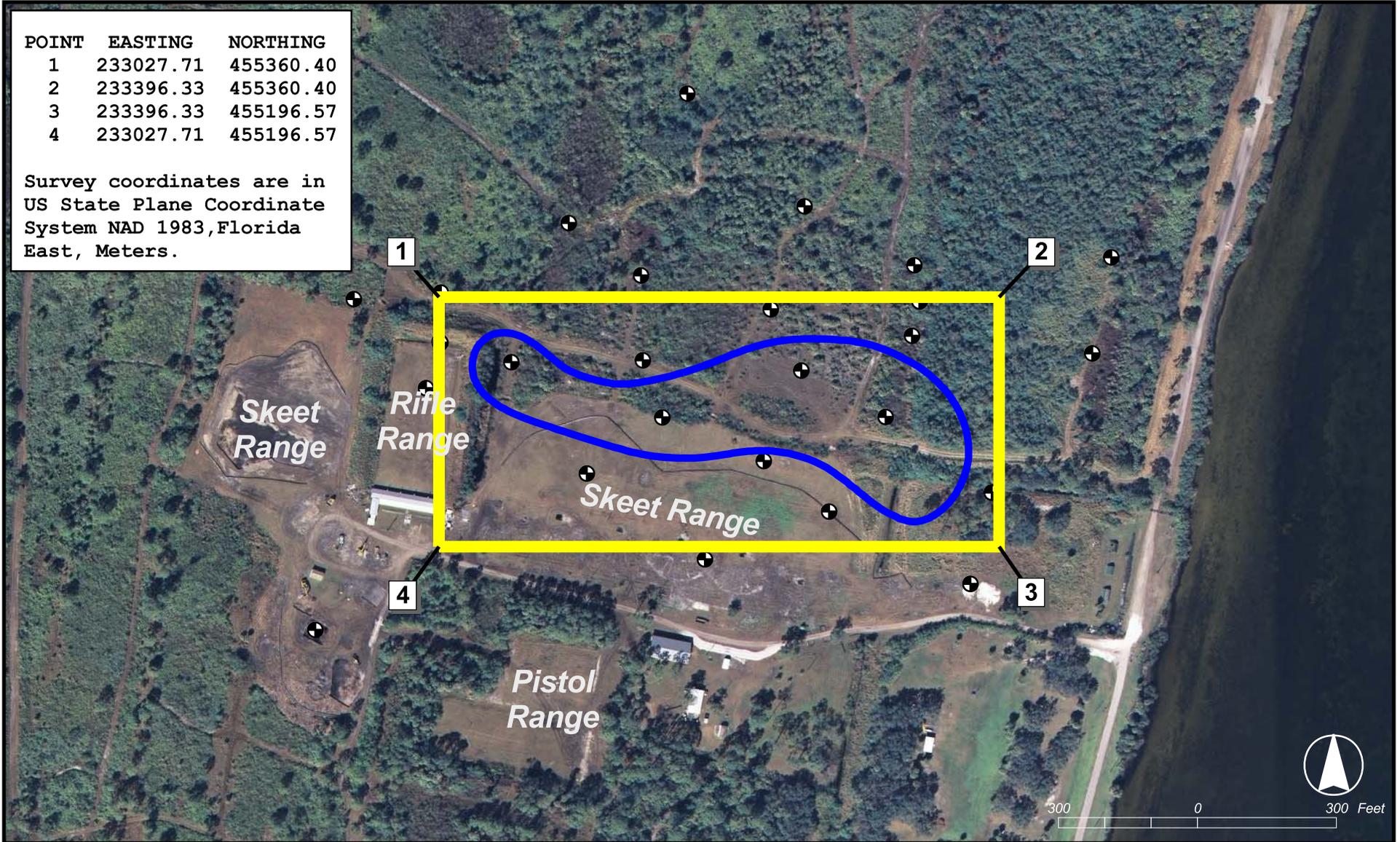


- Legend:
- Monitoring Well
 - Arsenic Plume (Background 30 ug/L)
 - Area covered by Statement of Basis and groundwater use control areas

FIGURE 4 LOC 9 SITE MAP
 KARS PARK I, KENNEDY SPACE CENTER, FLORIDA

POINT	EASTING	NORTHING
1	233027.71	455360.40
2	233396.33	455360.40
3	233396.33	455196.57
4	233027.71	455196.57

Survey coordinates are in US State Plane Coordinate System NAD 1983, Florida East, Meters.



- Legend:
-  Monitoring Well
 -  Dissolved Lead Plume based on May 2006 results (GCTL 15 ug/L)
 -  Area covered by Statement of Basis and groundwater use control areas