Results of Presence/Absence Testing for Subsurface and Obscured Archaeological Resources within Higher Probability Areas of the Juneau International Airport, Juneau, Alaska

Submitted to

Federal Aviation Administration
Alaskan Region, Airports Division
Anchorage, Alaska

Juneau International Airport
Juneau, Alaska

and

Alaska State Historic Preservation Office
Anchorage, Alaska

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INTRODUCTION

In July 2007 the Federal Aviation Administration (FAA) Alaskan Region Airports Division issued a Record of Decision (ROD) for an environmental impact statement (EIS) analyzing and disclosing the anticipated impacts to the human environment from a series of proposed actions intended to satisfy determined needs at the Juneau International Airport in Juneau, Alaska (Figure 1). The actions selected by the FAA in the ROD include the following:

- Improve lateral and runway-end runway safety area for Runway 08/26 through the installation of graded fill (EIS Alternative RSA-5E);
- Install navigational aids on the Runway 26 end to improve pilot alignment with the runway in poor visibility conditions (EIS Alternative NAV-2B);
- Provide safer and more efficient access to the Airport Fuel Farm via construction of a new on-airport access road (EIS Alternative FF-1);
- Develop new aviation facilities, including hangar space and aircraft parking, in the Northwest and Northeast Development Areas (EIS Alternative FW/RW-2);
- Construct a new snow removal equipment and maintenance facility (EIS Alternative SREF-3B1); and
- Implement measures to reduce and control wildlife hazards at the airport (modified EIS Alternative WH-1).

The selected actions are primarily located on existing airport property, which is owned by the City and Borough of Juneau (CBJ). However, certain actions (e.g., the navigational aids) and portions of other actions (e.g., runway safety area, wildlife hazard management, and aviation facilities development in the Northwest Development Area) will occur on lands owned by the State of Alaska as part of the Mendenhall Wetlands State Game Refuge (the Refuge). Some of the Refuge lands affected by the actions will be permanently acquired by CBJ. Other lands will, such as those needed for the navigational aids, will be subject to a lease or easement, but ownership of the land will remain with the State of Alaska.

All of the selected actions will result in ground disturbance, either in previously disturbed areas or areas that have yet to be impacted by airport or adjacent development. As part of the EIS, SWCA Environmental Consultants (SWCA) conducted archival research and pedestrian inventory of all areas that could be impacted by the projects under consideration. The results of these efforts were reported in a summary technical report (Ellis 2002). Several historical archaeological sites were documented by SWCA, and all sites were determined to be ineligible for listing on the National Register of Historic Places (NRHP). However, in the technical report, SWCA noted that dense vegetation and sedimentation in certain portions of the study area could be obscuring cultural materials. During consultation with the Alaska State Historic Preservation Officer (SHPO), the SHPO concurred with this observation and, in consideration of the known historic and

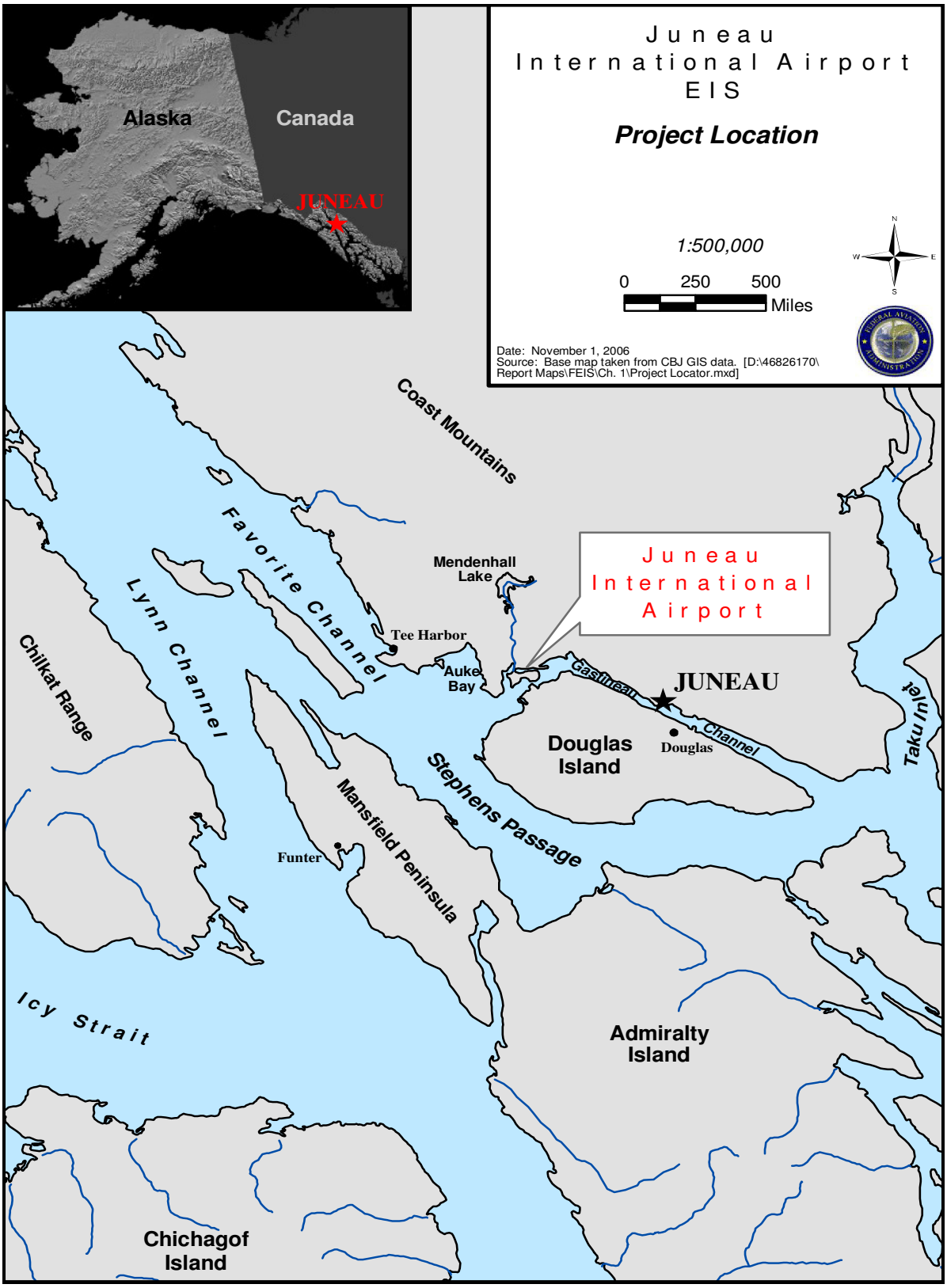

Figure 1. Location of Juneau International Airport EIS Project.

ethnographic uses of the area, recommended that subsurface probing be conducted within those portions of the area of potential effects (APE) with a high (or higher) potential for containing subsurface or obscured archaeological resources. The FAA agreed with this recommendation and committed to carrying out the subsurface investigations following selection of final project alternatives in the ROD but prior to any ground disturbance in the high probability areas of the APE. In early July 2007, the FAA and the SHPO, in conjunction with the City and Borough of Juneau, executed a Programmatic Agreement (PA) to guide the execution of these investigations.

The first stipulation of the PA required preparation of an archaeological resources investigation plan establishing the methods by which the investigations will be conducted. SWCA submitted the investigation plan to the FAA and SHPO, who approved it in August 2007 (Ellis 2007). All necessary permits were obtained from the SHPO and the Alaska Department of Fish and Game (managers of the Mendenhall Wetlands State Game Refuge (MWSGR), on which some testing was to occur). Field investigations to implement the investigation plan were carried out between September 10 and 14, 2007. This document reports the results of the field investigations.

AREAS OF INVESTIGATION

Three portions of the EIS cultural resources APE encompassing approximately 78 acres are considered to have a combination of features (e.g., known past use or flat areas near water sources and either dense surface vegetation or known sediment deposition) supporting further investigation for subsurface or obscured archaeological resources (Figure 2). These areas are the Northwest Development Area, the Western Runway Safety Area (RSA)/ Wildlife Hazard Management Plan (WHMP) Area, and the Eastern Runway Safety (RSA) Area.

Overview of Northwest Development Area

The Northwest Development Area is a flat area that is bisected by Duck Creek and which is believed to have been used during the historical period for activities associated with the World War II military occupation of the airport. This area is covered in dense vegetation, both in the form of duff and living plants. The investigation area contains 23.2 acres.

The Western RSA/WHMP Area is located between the existing developed airport facilities and the east bank of the Mendenhall River. This area contains varied terrain, with a few small, flat benches and several tidal sloughs. The area is regularly inundated by tidal fluctuation along this portion of the Mendenhall River, which causes sediment to be deposited on a regular basis. Informant interviews conducted as part of the EIS document ethnographic uses of the lower Mendenhall River channel

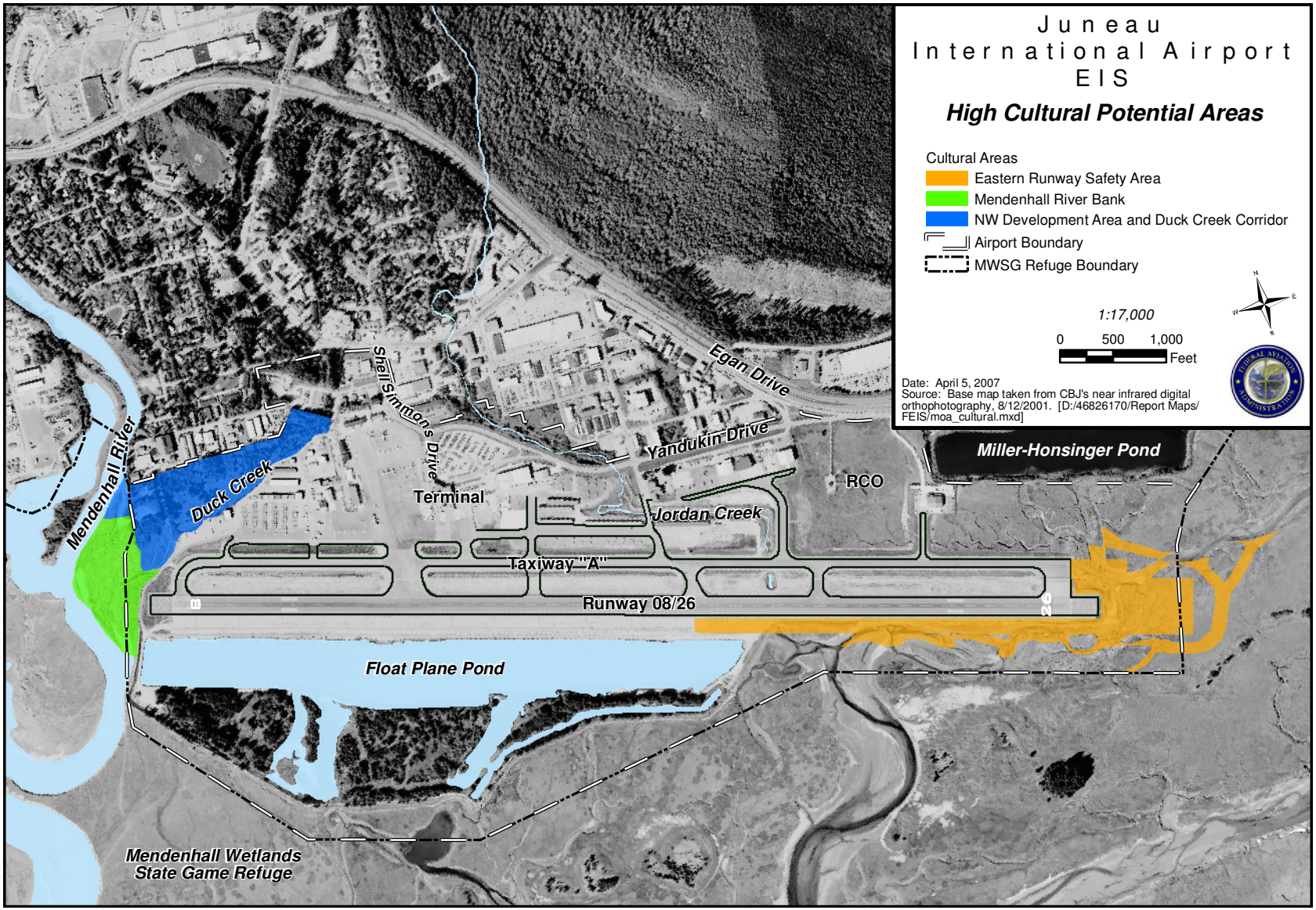

Figure 2. Location of areas to be investigated for subsurface/obscured resources.

for subsistence activities and the presence of a Tlingit smokehouse in the area. Although no specific location could be determined for the former smokehouse, this portion of the APE is still considered to have a comparatively high probability for containing subsurface resources relative to the rest of the study area. The investigation area contains 13.8 acres.

Overview of Western RSA/WHMP Area

The east Runway Safety Area is located east and south of the existing runway. This area is generally flat, but is incised with numerous small and large tidal sloughs that are regularly inundated, resulting in deposition of sediment. The locations of the sloughs have shifted over time as drainage patterns have changed. Given the known use of tidal sloughs by the Tlingit for the placement of fish weirs, this area is considered to have moderately high potential for subsurface cultural materials compared to other areas of the airport. The investigation area contains 40.6 acres.

Overview of Eastern RSA Area

APPROACH

SWCA implemented a multi-component approach to carrying out the presence/absence investigations. This approach consisted of limited surface scraping, soil probing, and shovel testing in combinations determined by the nature of each study area. Within the Northwest Development Area, where surface vegetation, including deadfall, constitutes the primary factor in obscuring potential archaeological resources, all three methods were used, although surface scraping could only be used in a few areas (e.g., under dense stands of trees where surface vegetation/duff was relatively dry and loose). Soil probing and shovel testing were used in the Eastern RSA Area and Western RSA/WHMP Area, where sedimentation may have buried archaeological resources and surface scraping was not feasible.

The specific locations for the placement of each method of inspection were determined in the field based upon professional judgment and environmental constraints. This approach constituted judgmental sampling of the study areas. The locations of each inspection unit placed in the field were obtained using a handheld GPS unit capable of differential correction and sub-meter accuracy.

Following is a more detailed description of each investigative method:

Surface Scraping: Flat-nosed shovels and/or rakes were used to carefully remove duff from a 1m x 1m area in order to examine the exposed ground surface for cultural materials. The duff was deposited onto a tarp for hand-sorting and visual inspection. Four surface scrapes were conducted, all in the Northwest Development Area. These scrapes were placed within dense stands of trees, where vegetation was sufficiently sparse and the duff layer was sufficiently dry to allow execution of the scrapes. *Because of satellite tracking interference from the tree cover in the areas of the scrapes, GPS coordinates could not be obtained for the scrapes.*

Soil Probing: Soil probing was carried out using a Ben Meadows 2-3/4 inch Gopher auger to obtain soil samples at varying depths across the study areas. Soils recovered through probing were visually inspected for cultural materials, possible cultural lenses, and general soil stratigraphy. When cultural materials were identified, additional exploration in the form of shovel testing, auger probing, and surface scraping was carried out as appropriate to identify the nature and extent of the materials. A total of 75 auger probes were excavated within the investigation areas.

Shovel Testing: Shovel testing was carried out using flat-nosed and sharp-nosed shovels. Test pits measured approximately 40 centimeters (cm) wide and were excavated to an average depth of 1 meter. When soil stratigraphy warranted shallower (e.g., encountering glacial gravels) or deeper (e.g., encountering loose sands) pits, the depth of the shovel test was adjusted accordingly. All soils removed from the shovel test pit were deposited onto a tarp for hand-sorting and visual inspection. When cultural materials were identified, they were documented using digital photography, written description, and handheld GPS units. Additional inspection in the form of further soil probing or shovel testing was employed as necessary to determine the nature and extent of the materials. A total of 84 shovel tests were excavated in the investigation areas.

COLLECTION OF ARTIFACTS

In accordance with the investigation plan (Ellis 2007) only diagnostic artifacts and perishable artifacts (e.g., bone or fibrous items) were to be collected for curation. Non-diagnostic artifacts such as lithic debitage as well as non-artifact faunal material was to be bagged in plastic bags labeled with the project name and date and returned to the test unit. Artifacts were encountered in two instances during the field investigations, and both were primarily near surface encounters; that is, both were found directly below the uppermost moss/surface matt layer. After exposing the extent of the items, the root mat was replaced so as to rebury the artifacts in situ. Items that were removed from their primary context in order to finish excavating the auger probe or shovel test, were to be bagged and placed near the top of the excavated hole. No artifacts requiring collection or reburial were encountered during testing.

DISCOVERY OF HUMAN REMAINS

The PA between the FAA, CBJ, and the SHPO outlined measures for the treatment of human remains should they be discovered during the field investigations. No such remains were encountered.

RESULTS

The results of the field investigations are discussed in this section of the report. They are presented by investigation area and include a summary of the inspection in each area, along with a description of any cultural resources that were encountered. The locations of the test units are provided on Figures 3 and 4. Details about individual shovel tests are provided in Appendix A. Details about individual auger probes are provided in Appendix B.

NORTHWEST DEVELOPMENT AREA

A total of 37 shovel tests and 36 auger probes were excavated within the Northwest Development Area investigation area (see Figure 3 for testing locations). Test units were placed so as to sample each of the topographic features (e.g., uplands, drainage channels, depressions, etc.).

The Soil Conservation Service (SCS) Soil Survey for the Juneau area (SCS 1974) identifies surface soils in the Northwest Development Area as being of two types: Be Series (BeA) and He Series (HeA). Be Series soils are generally described as "excessively drained very gravelly sandy soils ... [that] are olive gray in color" (SCS 1974:6). Vegetation in these soils typically consists of "slow growing Sitka spruce, willows, patches of cottonwood, and scattered open patches of low shrubs, grasses, and herbs" (SCS 1974:6).

More specifically, a profile of Be (BeA) Series soils consists of 3 cm of very dark brown duff overlaying 5 cm of loose olive-colored sand, and 147 cm of olive gray very gravelly sand. The texture of the upper 25 cm typically "ranges from silt loam to gravelly sand ... [and] gravel and cobblestones generally make up 50 to 75 percent of the volume of soil below [25 cm]" (SCS 1974:7).

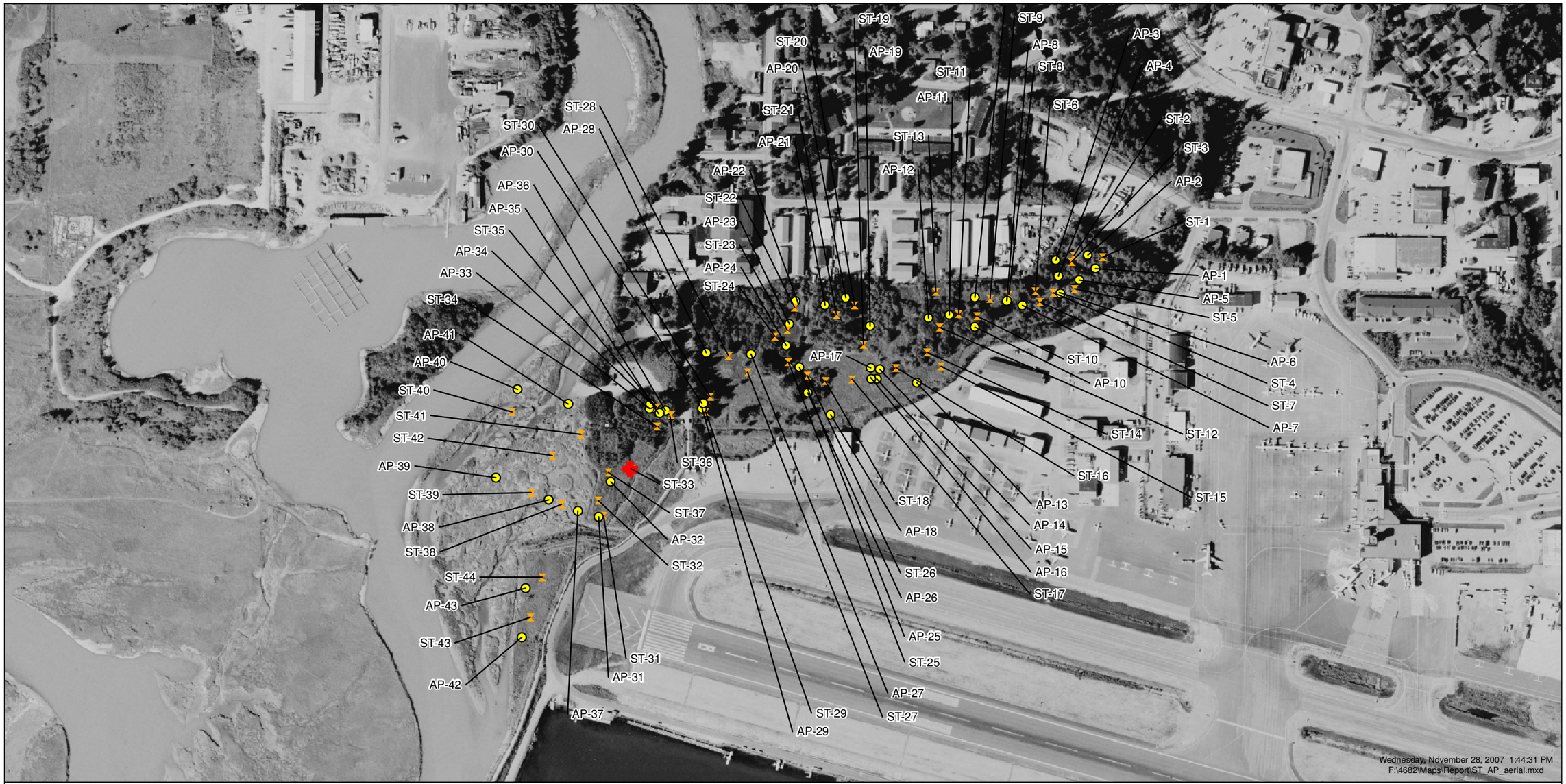

Figure 3. Location of shovel tests and auger probes in the Northwest Development Area and Western RSA/WHMP Area.

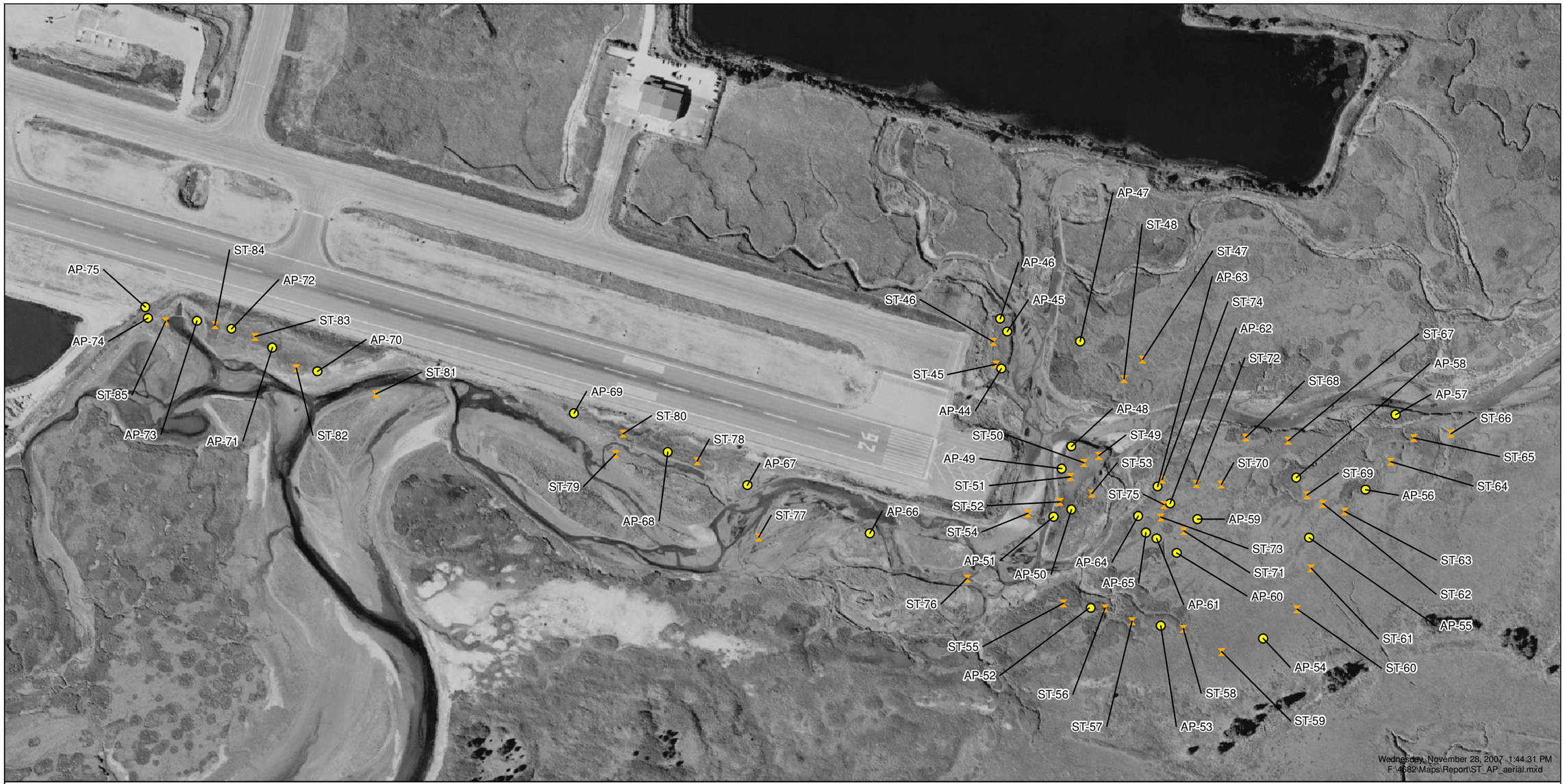

Figure 4. Location of shovel tests and auger probes in the Eastern RSA Area.

He (HeA) Series soils, which are identified by the SCS Soil Survey as comprising the majority of surface soils in the Northwest Development Area, are described as "well drained soils on nearly level alluvial plains in broad stream valleys ... [and composed of] olive gray silty and sandy waterlaid sediments more than [102 cm] thick over gravel and coarse sand" (SCS 1974:10). These soils are commonly associated with forests of Sitka spruce and western hemlock.

A typical profile in He (HeA) Series soils consists of (from top to bottom) 5 cm of dark reddish brown forest litter with many roots, 18 cm of dark grayish brown fine sandy loam, 84 cm of olive gray stratified silt and fine sand, 30 cm of dark gray stratified silt and fine sand, and 20 cm of coarse sand and gravel. In some areas, sediments may be interspersed with layers of coarse sand and pebbles.

The SCS soil descriptions are generally consistent with the soils exhumed during the subsurface testing in the Northwest Development Area. Dense gravel layers were persistently present in the test units and ranged in thickness from 10-40 cm. Several shovel tests exposed thick strata of light- to medium-tan coarse grained sand beneath strata of olive colored silty loam. The sandy stratum was loosely packed and contained a high gravel content. In general these sands, which were most typically identified in shovel test units excavated in the eastern and west-central portions of the Northwest Development Area study area, appear to be associated with former meanders of the Duck Creek channel.

Gray, olive-gray, and brown-gray silty loam was encountered throughout the upland formations in this testing area. These soils are consistent with the SCS soil classifications for the area, suggesting that very little alteration of soils in the Northwest Development Area occurred during the World War II era military use of the airport (i.e., ground disturbance was limited and likely restricted to surface or near surface depths). Some of the shovel test units in the upland areas exhibited inconsistent/non-uniform streaking and small, asymmetrical inclusions of loose, fine-grained, powdery, red-orange silty sands. These streaks and inclusions appear to be natural in origin and represent iron-rich sediments. At first it was thought that these sediments may represent volcanic ash or other pyroclastic material, but further research indicates that they are inconsistent with previously established volcanic horizons known for the general airport area (Mobley and Betts 1997). Further examination of a sediment sample yielded no evidence of volcanic material.

Five shovel tests and one auger probe uncovered cultural materials during testing in the Northwest Development Area. A seventh item was found on the ground surface while working in the area. Five of these discoveries consisted of materials of modern origin, and two consisted of materials of probable historical origin. Of the two historical discoveries, one consists of a concrete foundation and associated features, and the other consists of a single artifact located on the ground surface.

The first discovery of modern materials occurred during excavation of the uppermost portion (0-25 cm below modern ground surface (bmgs)) of Shovel Test (ST) 3. The item uncovered consisted of a single piece of deteriorated milled lumber. The lumber had a modern wire nail embedded in it. No other cultural items were found in association with the lumber.

The second discovery of modern materials occurred during excavation of the uppermost portion (0-8 cm bmgs) of ST-34. The cultural materials consisted of two fragments of clear glass and one fragment of Styrofoam.

The third discovery of modern materials occurred during excavation of the uppermost portion (0-26 cm bmgs) of ST-35. The cultural materials consisted of three fragments of concrete and five fragments of asphalt all piled on top of each other. The materials appear to be the result of ground clearing, probably related to development of the adjacent road and trailhead parking area.

Overview of modern discovery

The fourth discovery of modern materials occurred during excavation of the uppermost portion (0-3 cm bmgs) of Auger Probe (AP) 18. The cultural materials consisted of one fragment of Styrofoam.

The most extensive (the fifth) modern discovery was identified during the excavation of ST-33. Cultural materials were identified immediately below the grass-mat layer and included bits of burned milled lumber, metal strapping, modern glass, and modern plastic. The grass-mat layer around the discovery was peeled back over a 2.5-meter by 2.5-meter area to expose nearly the entire discovery. Multiple auger probes were excavated around the perimeter of the exposed area to further define the extent of the discovery. The exposed materials were examined for indications of former function and potential date of origin. No historical characteristics were identified on any of the items, and the presence of obviously modern glass and plastic in association with the discovery clearly suggests that it is of modern origin. There was no indication that the materials are associated with the former Tlingit smokehouse that was reported by local informants to exist somewhere in the vicinity of the lower Mendenhall River channel. Given these factors, this discovery was not identified as a cultural resources site for AHRS documentation and would not be eligible for consideration under the criteria of the NRHP.

The primary historical discovery (Site JUN-01074) consisted of a concrete foundation, an earthen berm, and a faint two-track road segment located immediately below the duff layer along the western edge of the testing area, directly east of the Airport perimeter fence. Three artifacts, including an engine block, a possible crank shaft, and an aluminum pole in a concrete base (probably a modern fence post introduced into the site), were also identified at the site. None of the artifacts or features provided clear evidence of their age, though most of the glass artifacts observed in the area appeared modern. Aerial photographs from 1948 show no obvious feature, structure, or disturbance in the area of the site; however, a 1962 aerial photograph shows that there had been some ground disturbance in the general vicinity of the site, but no structure is clearly identifiable.

The foundation (Feature 1) at Site JUN-01074 was completely obscured by duff at the time it was discovered during the excavation of ST-29. The southeastern corner of the pad is obscured by dense tree growth, suggesting that the foundation is either irregularly shaped or the trees grew through cracks in the concrete. The actual southeast corner of the foundation could not be located. The foundation averages 14 feet 6 inches wide (east-west) by 20 feet long (north-south) and is 7 inches thick. No markings or other characteristics were identified that indicated the former function of the feature.

Close up of exposed portion of concrete foundation at Site 4682.05

Feature 2 at Site JUN-01074 is an earthen berm that measures approximately 35 feet long and averages 4 feet 4 inches tall. It has an average base width of 8 feet 7 inches. The berm appears to be the result of post-abandonment ground disturbance at the site, representing a push pile rather than an intentionally constructed feature.

Feature 3 is a faint two-track road segment that extends from near the berm (Feature 2) to the northeast, away from the site. The road track measured 4 feet 6 inches wide between the centers of the tire swales. Approximately 100 feet of the road could be discerned through the dense vegetation in the testing area.

Archival research failed to yield any information about the former function or exact date of origin for the site. In addition to the aerial photographs noted above, available maps of the airport property were also consulted, as were readily available documents related to the military history of the airport. Information from the aerial photographs suggests the site may have originated after World War II. Because no clear association between Site JUN-01074 and important historical events and persons could be established through the on-site artifacts and features or archival research, this site is considered to be ineligible for listing on the NRHP under Criteria A and B. Further, the site does not possess any unique, important, or representative architectural or engineering features and does not appear to be particularly representative of a type, style, or method of construction. As such, it is considered ineligible for the NRHP under Criterion C. Finally, the physical content of the site does not appear to have any potential to yield information that could be important in furthering our collective understanding about past human activity in the area. The shallow nature of the site (i.e., it is a surface site), the disturbance from post-abandonment earth moving, and the general lack of artifacts severely limits the ability to obtain useful or important information from it. Therefore, this site is considered ineligible for the NRHP under Criterion D.

The second discovery of historical materials consists of one isolated artifact located during general testing activities in the Northwest Development Area. This artifact, which was found in a thick layer of duff in a dense stand of trees, consists of the remains of an apparent grinder of unknown age. No makers' marks or other identifying marks were observed on the artifact.

WESTERN RSA/WILDLIFE HAZARD MANAGEMENT (WHMP) AREA

A total of 7 shovel tests and 7 auger probes were excavated within the Western RSA/WHMP Area investigation area (see Figure 3 for testing locations). The northern portion of this testing area overlaps with the Northwest Development Area. Test units were placed so as to sample each of the topographic features (e.g., uplands, drainage channels, periodically inundated areas, etc.). Testing in the area took place during low tide, so that typically inundated areas were exposed and available for testing.

The SCS Soil Survey for the Juneau area (SCS 1974) identifies surface soils in the Western RSA/WHMP Area as being of two types: Be Series (BeA) and Co Series (CoA). Be Series soils are also present in the Northwest Development Area testing area and are described above. Co (CoA) Series soils are described as "poorly drained soils on very low-lying, nearly level alluvial plains ... The soils consist of deep gray silty waterlaid sediments that commonly contain thin strata of sandy material and seams of peat" (SCS 1974:708). Typical vegetation in this soil type consists of sedge and grasses (SCS 1974:8).

A typical profile in Co (CoA) Series soils consists of (from top to bottom) 5 cm of undecomposed straw, 5 cm of dark reddish brown silt loam, 8 cm of very dark grayish brown silt loam, and 140 cm of dark gray silt loam (SCS 1974:8). Shovel tests and auger probes within the Western RSA/WHMP testing area yielded a soil profile that is consistent with this SCS description, indicating that human disturbance of soils in the area has been minimal. Extremely dense river gravels were encountered, typically below 25 cm, in numerous shovel test and auger probe units, prohibiting excavation of the units to the full 1 meter below ground surface. Soils in the lowland were water-logged, with water seeping into test units as they were excavated.

No cultural materials were identified during testing in the Western RSA/WHMP investigation area.

EASTERN RSA AREA

A total of 40 shovel tests and 32 auger probes were excavated within the Eastern RSA investigation area (see Figure 4 for testing locations). Test units were primarily placed in upland areas, though several were excavated in shallow slough channels during low tide.

The SCS Soil Survey for the Juneau area (SCS 1974) identifies surface soils in the Eastern RSA Area as being of a single type: Be (BeA) Series. Be (BeA) Series soils are also present in the Northwest Development Area testing area and are described above.

Overall, soils exposed in the shovel tests and auger probes were consistent with the typical Be (BeA) Series soil profile. The exceptions were test units excavated in and directly adjacent to slough channels. Within these units, loose, tan (various hues), coarse-grained sands were encountered, most commonly below 30 cm. These sands appear to represent water-laid materials deposited during tidal

fluctuations and drainage in the slough channels. All soils exposed during testing in the Eastern RSA Area appear to be of natural origin.

No cultural materials were identified during testing in the Eastern RSA investigation area.

CONCLUSION

Pursuant to a Memorandum of Agreement between the Federal Aviation Administration, the City and Borough of Juneau (CBJ), and the Alaska State Historic Preservation Officer, SWCA was contracted by CBJ to conduct presence/absence testing for obscured and subsurface archaeological resources within three higher probability areas of the Juneau International Airport EIS project area. This testing, which consisted of a combination of shovel tests and auger probes, along with a limited number of surface scrapes, was carried out in September 2007.

Three discoveries of cultural materials occurred during testing. One consisted of an isolated artifact (a grinder), and one consisted of modern debris located below the grass-mat soil layer between the Mendenhall River and the Dike Trail. The third discovery (Site JUN-01074) consisted of a probable historical foundation and associated earthen berm and faint two-track road. Three artifacts, including an aluminum pole in concrete (possibly a modern fence post), a possible crank shaft, and a partial engine block, were identified in association with the discovery. Owing to a lack of identifiable historical associations within important events or persons, a lack of physical integrity, and a lack of potential to yield important information about past uses of the area, this site is considered ineligible for the National Register of Historic Places.

No other cultural materials were identified during testing. Soil profiles exposed during the testing appear consistent with natural soils for the area. Given the findings of the presence/absence testing by SWCA, no further testing or pre-construction investigation for cultural resources is warranted at this time. However, despite the findings of the testing program, unanticipated discoveries could occur during construction of the proposed projects at the Airport, though the likelihood of such a discovery now appears relatively low. In order to address this issue, contracts issued for construction of the projects at the Airport should include provisions for unanticipated discovery of cultural resources and human remains. These provisions, which are typically required as part of the construction contract documents, should call for the immediate cessation of all work that could impact the discovered resource, securing of the discovery against any further impact, looting, or vandalism, and immediate notification of the FAA Airports Division and the Alaska State Historic Preservation Officer. Provisions for notification of the jurisdictional law enforcement agency in the event that human remains are found should also be included.

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APPENDIX A: SHOVEL TEST NOTES

Northwest Development Area Shovel Testing					
ST#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
ST-01	1	0-40	Medium tan sand with small subangular cobbles	Negative	Soil was hard-packed and difficult digging because of gravels. 0-20 cmbs lots of small roots and high organic content.
ST-01	2	40-80	Light tan sand with small gravels.	Negative	Soil was soft and easy to dig.
ST-01	3	80-100	Medium tan sand with medium to large subangular cobbles.	Negative	The soil was hard-packed. Water table was at 95 cmbs.
ST-02	1	0-20	Red-tan sand with medium gravels, root mat level.	Negative	
ST-02	2	20-80	Tan-gray sand with medium gravels.	Negative	
ST-02	3	80-100	Dark gray sand with small to medium gravels.	Negative	The soil was darkened because of proximity to water table.
ST-03	1	0-25	Red-tan sand with small gravels, root mat level.	**Positive**	Milled 2x4 fragmented beneath surface. 2x4 is deteriorated.
ST-03	2	25-70	Tan-gray sand with medium gravels.	Negative	
ST-03	3	70-100	Dark gray sand with small to medium gravels.	Negative	Water table was observed at 100 cmbs.
ST-04	1	0-15	Brown silty loam and clay loam with duff.	Negative	
ST-04	2	15-25	Brown-gray sandy loam.	Negative	
ST-04	3	25-40	Gray sand with small gravels.	Negative	
ST-04	4	40-100	Tan-white sand with a lot of medium sized gravels.	Negative	
ST-05	1	0-20	Dark brown silty sand;, duff.	Negative	Duff layer, high organic content.
ST-05	2	20-100	Light tan coarse-grained sand, unconsolidated.	Negative	
ST-06	1	0-8	Dark brown silty sand, duff.	Negative	Duff layer, high organic content, heavy root mat.
ST-06	2	8-32	Medium brown coarse-grained sand with moderate content of small gravels.	Negative	
ST-06	3	32-100	Light tan coarse-grained sand.	Negative	Soil became looser below 38 cmbs.
ST-07	1	0-15	Tan-brown loam, root mat.	Negative	

Northwest Development Area Shovel Testing					
ST#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
ST-07	2	16-30	Red-tan sandy loam.	Negative	
ST-07	3	31-100	Tan-white sand.	Negative	No gravels
ST-08	1	0-8	Dark brown silty sand, duff; moderate clay content.	Negative	
ST-08	2	8-68	Medium tan fine-grained silty loam; moderate clay content.	Negative	
ST-08	3	68-70	Light tan silty loam.	Negative	Irregular band across the unit.
ST-08	4	70-100	Medium tan fine-grained silty loam moderate clay content.	Negative	
ST-09	1	0-20	Brown loam, root mat.	Negative	
ST-09	2	21-25	Tan-brown sandy loam.	Negative	
ST-09	3	26-70	Yellow-tan sand.	Negative	
ST-09	4	71-76	Red-brown sandy loam.	Negative	
ST-09	5	77-100	Yellow-tan sand.	Negative	
ST-10	1	0-10	Red-tan loam.	Negative	
ST-10	2	10-26	Brown-tan sandy loam.	Negative	
ST-10	3	27-100	Brown-gray silty loam.	Negative	
ST-11	1	0-12	Dark brown silty loam, duff.	Negative	Root mat.
ST-11	2	12-100	Gray-brown compacted clay loam with reddish silty sand inclusions.	Negative	
ST-12	1	0-12	Dark brown silty sand, duff.	Negative	Root mat.
ST-12	2	12-100	Gray-brown compacted clay loam with reddish silty sand inclusions.	Negative	
ST-13	1	0-5	Red-tan loam	Negative	
ST-13	2	6-27	Brown-gray silty loam.	Negative	
ST-13	3	28-100	Gray silt with small gravels.	Negative	
ST-14	1	0-12	Dark brown silty sand, duff.	Negative	Root mat.
ST-14	2	12-55	Gray-brown medium-grained clay loam with small reddish-brown silty sand inclusions.	Negative	

Northwest Development Area Shovel Testing					
ST#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
ST-14	3	55-58	Reddish-gray silty sand.	Negative	
ST-14	4	58-67	Gray-brown silty clay loam.	Negative	
ST-14	5	67-69	Reddish-gray silty sand.	Negative	
ST-14	6	69-100	Gray-brown somewhat coarse grained silty clay loam with small reddish-brown silty sand inclusions.	Negative	
ST-15	1	0-3	Red-brown loam.	Negative	
ST-15	2	4-9	Brown-gray silty loam.	Negative	
ST-15	3	10-100	Red-tan sandy loam.	Negative	
ST-16	1	0-10	Red-brown loam.	Negative	
ST-16	2	10-25	Brown silty loam with small gravels.	Negative	
ST-16	3	26-100	Tan-brown silty loam with gravels.	Negative	
ST-17	1	0-8	Dark brown silty sand/loam, duff.	Negative	Root mat.
ST-17	2	8-46	Reddish-brown coarse-grained sandy loam with high medium to large subangular gravel content.	Negative	
ST-17	3	46-68	Reddish-brown coarse-graiedn sandy loam with low medium to large subangular gravel content.	Negative	
ST-17	4	68-78	Light tan coarse-grained sandy loam with low medium to large subangular gravel content.	Negative	
ST-17	5	78-100	Medium tan coarse-grained sandy loam with low medium to large subangular gravel content.	Negative	
ST-18	1	0-20	Red-brown sandy loam with extensive gravels.	Negative	
ST-18	2	21-60	Tan-gray sandy silt.	Negative	
ST-18	3	60-100	Red-tan sandy loam with extensive gravels.	Negative	
ST-19	1	0-7	Tan-brown loam, root mat.	Negative	
ST-19	2	8-32	Brown-gray sandy loam with small gravels.	Negative	

Northwest Development Area Shovel Testing					
ST#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
ST-19	3	33-100	Gray-tan sand with small to medium gravels.	Negative	Gravels throughout.
ST-20	1	0-8	Dark brown silty loam, root mat, duff	Negative	
ST-20	2	8-34	Medium brown sandy loam, roots	Negative	Densely packed, fine-grained
ST-20	3	34-100	Light brown-tan sandy loam, one small subangular cobble	Negative	Fine- to medium-grained, looser than Level 2
ST-21	1	0-9	Brown-tan loam, root mat.	Negative	
ST-21	2	10-29	Gray silty loam with small gravels.	Negative	
ST-21	3	30-100	Tan-gray sand with baseball size gravels.	Negative	
ST-22	1	0-11	Red-brown loam, root mat.	Negative	
ST-22	2	12-34	Brown-tan silty loam with occasional small gravels.	Negative	
ST-22	3	35-100	Gray-tan sandy loam with small to medium gravels.	Negative	
ST-23	1	0-8	Dark brown silty loam with heavy root mat.	Negative	
ST-23	2	8-32	Medium brown silty loam (fine grained silty sand) with moderate root system and moderate content of small to medium subangular gravels.	Negative	
ST-23	3	32-100	Medium brown silty loam (fine grained silty sand) few roots and few gravels.	Negative	
ST-24	1	0-12	Dark brown silty loam, dense root mat.	Negative	
ST-24	2	12-75	Medium brown silty loam with moderate content of small to medium subangular river/glacial gravels.	Negative	Compact
ST-24	3	75-100	Red-brown silty loam with low gravel content and small reddish-orange inclusions of sandy silt.	Negative	Slightly less compact than previous level, fewer gravels.
ST-25	1	0-11	Tan-brown loam, root mat.	Negative	

Northwest Development Area Shovel Testing					
ST#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
ST-25	2	12-26	Red-tan sandy loam, with small to medium gravels.	Negative	
ST-25	3	27-100	Yellow-tan sandy loam with medium to large gravels.	Negative	
ST-26	1	0-10	Tan-brown clay loam, root mat.	Negative	
ST-26	2	11-24	Gray-brown clay loam with small gravels.	Negative	
ST-26	3	25-82	Yellow-tan sandy loam with small to medium gravels.	Negative	
ST-26	4	83-100	Red-tan sandy loam with medium to large gravels.	Negative	
ST-27	1	0-8	Dark brown silty loam, duff, root mat.	Negative	
ST-27	2	8-75	Medium brown silty loam with moderate to high content of small to medium subangular gravels.	Negative	Dense and fine-grained.
ST-27	3	75-100	Medium brown silty loam with narrow irregular bands of light brown-tan silty sand. Moderate content of small subangular gravels.	Negative	
ST-28	1	0-11	Red-brown silty loam, root mat.	Negative	
ST-28	2	12-38	Tan-brown sandy loam with small to medium gravels.	Negative	
ST-28	3	39-100	Tan-gray clay loam with fine silt and a small red-tan layer.	Negative	
ST-29	1	0-4	Dark brown silty loam, duff and root mat.	**Positive**	Concrete pad lying directly below the duff layer. Designated site 4682-5 (Feature 1). Small fragments of bottle glass of probable modern age; no datable marks on glass.
ST-30	1	0-9	Red-brown loam with small gravels, root mat.	Negative	ST-30 appears to be located in a faint two-track road designated 4682-5 (Feature 3)
ST-30	2	10-32	Yellow-tan sandy loam with medium gravels.	Negative	ST-30 appears to be located in a faint two-track road designated 4682-5 (Feature 3)

Northwest Development Area Shovel Testing					
ST#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
ST-30	3	33-100	Tan-brown clay loam with occasional small gravels.	Negative	ST-30 appears to be located in a faint two-track road designated 4682-5 (Feature 3)
ST-31	1	0-30	Dark brown silty loam with low gravel content, roots/root mat.	Negative	Organic level, fine grained.
ST-31	2	30-32	Reddish-orange fine to medium grained sandy loam.	Negative	
ST-31	3	33-40	Gray fine-grained clay loam with high small to medium sized gravel content.	Negative	
ST-31	4	40-100	Medium brown coarse-grained sand with high pea gravel content.	Negative	
ST-32	1	0-11	Red-brown loam, root mat.	Negative	
ST-32	2	12-35	Gray silt and clay loam with small gravels.	Negative	
ST-32	3	36-39	Red-brown clay loam.	Negative	
ST-32	4	40-48	Yellow-tan sandy with small to medium gravels.	Negative	
ST-32	5	49-100	Tan-brown sand with gravels.	Negative	
ST-33	1	0-7	Brown loam, roots and debris.	**Positive**	Encountered metal and wood debris just beneath the vegetation mat. An area roughly 2.5m x 2.5m was exposed revealing a wide area of similar metal and wood debris. Materials appear modern.
ST-33	2	8-23	Red-brown silty loam.	Negative	
ST-33	3	24-60	Brown-gray loam.	Negative	
ST-33	4	61-100	Red-tan sandy loam with small to medium gravels.	Negative	
ST-34	1	0-8	Dark brown fine-grained silty loam, root mat.	**Positive**	Two fragments of clear modern glass and one fragment of Styrofoam were observed.
ST-34	2	8-50	Medium brown silty loam with high to medium gravel content with reddish orange inclusions.	Negative	

Northwest Development Area Shovel Testing					
ST#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
ST-34	3	50-55	Gray clay loam with high medium sized gravel content and reddish-orange inclusions.	Negative	Stopped by impenetrable gravel level.
ST-35	1	0-26	Medium brown medium-grained silty loam. Roots in first 15 cmbs are dense, fewer roots below 15 cmbs.	**Positive**	Three fragments of concrete and 5 fragments of asphalt. The fragments were jumbled, one on top of the other. One fragment of modern clear bottle glass. Result of modern ground disturbance.
ST-35	2	26-65	Medium brown silty loam with moderate content of small to medium cobbles.	Negative	
ST-35	3	65-75	Gray-brown clay loam with high content of medium cobbles.	Negative	Stopped by impenetrable gravel level.
ST-36	1	0-6	Dark brown clay loam with gravels, root mat.	Negative	
ST-36	2	7-100	Light gray sandy loam with gravels.	Negative	Sediment appears to be transported fill for leveling associated parking lot.
ST-37	1	0-60	Dark brown silty loam with few small gravels and small reddish-orange silt inclusions.	Negative	
ST-37	2	60-63	Reddish-orange fine-grained silty loam.	Negative	
ST-37	3	63-100	Gray fine-grained clay loam.	Negative	

Western Runway Safety Area/Wildlife Hazardous Management Plan Area Shovel Testing					
ST#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
ST-38	1	0-12	Gray clay loam, root mat.	Negative	
ST-38	2	13-36	Gray clay loam with small gravels	Negative	
ST-38	3	37-48	Gray sandy loam with dense gravels.	Negative	
ST-39	1	0-25	Dark brown fine-grained silty loam with natural wood fragments, root mat.	Negative	
ST-39	2	25-66	Medium brown coarse-grained sandy loam with small to medium subangular gravels.	Negative	Stopped at dense gravels layer.
ST-40	1	0-46	Medium to dark brown fine-grained silty loam, root mat. Small reddish silty clay inclusions, natural wood, and natural organic matter with associated vegetation mat.	Negative	
ST-40	2	46-56	Gray-brown sandy loam with high content of small to medium sized subangular gravels.	Negative	Dense gravels; stopped because hit water table.
ST-41	1	0-5	Gray-tan clay loam, root mat.	Negative	
ST-41	2	6-20	Gray clay loam.	Negative	
ST-41	3	21-54	Gray-brown sandy loam with gravels.	Negative	
ST-41	4	55-68	Red-tan sandy loam with dense gravels.	Negative	Stopped at dense gravels.
ST-42	1	0-8	Medium to dark brown fine-grained silty loam, roots, natural organic matter.	Negative	
ST-42	2	8-13	Gray-brown fine-grained silty loam, few roots, bits of natural wood, reddish brown silty clay pockets.	Negative	
ST-42	3	13-21	Reddish-brown fine-grained clay loam.	Negative	Irregular thickness.
ST-42	4	21-40	Medium brown with some orange tint, coarse-grained sandy loam with high content of small to medium sized subangular gravels.	Negative	Stopped at dense gravels.
ST-43	1	0-5	Tan-brown clay loam, root mat.	Negative	
ST-43	2	6-16	Tan clay loam with small gravels.	Negative	

Western Runway Safety Area/Wildlife Hazardous Management Plan Area Shovel Testing					
ST#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
ST-43	3	17-100	Yellow-tan sandy loam with medium to large gravels.	Negative	
ST-44	1	0-23	Medium brown-gray clay loam, root mat and vegetation mat, with fine-grained gray silty clay.	Negative	
ST-44	2	23-36	Reddish-brown clay loam and fine-grained silty clay loam.	Negative	
ST-44	3	36-100	Medium brown-orange sandy loam with high gravel content of small to medium sized subangular gravels.	Negative	Stopped at dense gravels.

Eastern RSA Shovel Testing					
ST#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
ST-45	1	0-4	Red-brown clay loam.	Negative	
ST-45	2	5-28	Gray clay loam.	Negative	
ST-45	3	29-53	Tan-gray sandy loam.	Negative	
ST-45	4	54-49	Tan sandy loam.	Negative	
ST-45	5	90-100	Red-tan sandy loam.	Negative	
ST-46	1	0-48	Medium brown fine-grained silty loam	Negative	A few thin irregular lenses of reddish-orange silty loam below 10 cmbs.
ST-46	2	48-54	Reddish-orange fine-grained silty loam.	Negative	
ST-46	3	54-64	Medium brown fine-grained silty loam.	Negative	
ST-46	4	64-100	Light tan-white coarse-grained sandy loam.	Negative	
ST-47	1	0-13	Tan-brown clay loam, root mat.	Negative	
ST-47	2	14-20	Red-brown sand.	Negative	
ST-47	3	21-59	Gray-brown clay.	Negative	
ST-47	4	60-68	Red-brown sand.	Negative	
ST-47	5	69-100	Tan-gray sand.	Negative	
ST-48	1	0-11	Dark brown loam, organic.	Negative	
ST-48	2	12-53	Gray-brown sandy loam.	Negative	
ST-48	3	54-63	Gray sandy clay loam.	Negative	
ST-48	4	64-100	Light gray sandy loam.	Negative	
ST-49	1	0-12	Brown clay loam.	Negative	
ST-49	2	13-23	Gray-brown sandy loam.	Negative	
ST-49	3	24-100	Tan-brown sandy loam.	Negative	
ST-50	1	0-18	Dark brown sandy loam, organic.	Negative	
ST-50	2	19-81	Light brown sandy loam with red-tan sand inclusions.	Negative	
ST-50	3	82-100	Light gray sandy loam with gray clay inclusions.	Negative	
ST-51	1	0-17	Brown silty loam.	Negative	
ST-51	2	18-39	Tan-brown sandy loam.	Negative	

Eastern RSA Shovel Testing					
ST#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
ST-51	3	40-100	Gray-tan sand.	Negative	
ST-52	1	0-14	Dark brown silty loam, organic.	Negative	
ST-52	2	15-23	Brown sandy loam with red-tan sand inclusions.	Negative	
ST-52	3	24-60	Gray sand with red-tan sand inclusions.	Negative	
ST-52	4	61-100	Dark gray sand with red-tan sand inclusions.	Negative	
ST-53	1	0-20	Brown sitly loam, root mat.	Negative	
ST-53	2	21-40	Tan-brown sandy loam.	Negative	
ST-53	3	41-76	Tan-gray sandy loam.	Negative	
ST-53	4	77-100	Gray-tan sandy loam.	Negative	Water table at 100 cmbs
ST-54	1	0-14	Light gray-brown sandy loam.	Negative	
ST-54	2	15-20	Gray sandy loam.	Negative	
ST-54	3	21-38	Black organic sand.	Negative	Peat layer? Water table at 38 cmbs
ST-55	1	0-12	Gray-brown sandy loam, root mat.	Negative	
ST-55	2	13-33	Tan-brown sandy loam.	Negative	
ST-55	3	34-100	Gray sandy loam.	Negative	
ST-56	1	0-20	Dark brown sandy loam, organic.	Negative	
ST-56	2	21-100	Gray sandy loam.	Negative	
ST-57	1	0-13	Gray-brown sandy loam, root mat.	Negative	
ST-57	2	14-38	Tan-brown sandy loam.	Negative	
ST-57	3	39-100	Gray sandy loam.	Negative	Water table at 100 cmbs
ST-58	1	0-21	Dark brown-gray sandy loam, organic.	Negative	
ST-58	2	22-100	Gray-brown sandy loam.	Negative	Water table at 100 cmbs
ST-59	1	0-10	Tan sandy loam, root mat.	Negative	
ST-59	2	11-30	Tan-gray sandy loam, root mat.	Negative	
ST-59	3	31-45	Tan sandy loam.	Negative	
ST-59	4	46-100	Gray sandy loam.	Negative	
ST-60	1	0-11	Dark brown clay loam, organic.	Negative	
ST-60	2	12-18	Gray sandy clay loam.	Negative	
ST-60	3	19-100	Gray clay loam.	Negative	

Eastern RSA Shovel Testing					
ST#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
ST-61	1	0-20	Tan-brown sandy loam, roots.	Negative	
ST-61	2	21-40	Brown clay loam.	Negative	
ST-61	3	41-50	Yellow-tan sandy loam.	Negative	
ST-61	4	51-100	Gray sandy loam.	Negative	Water table at 100 cmbs
ST-62	1	0-7	Dark brown sandy loam, organic.	Negative	
ST-62	2	8-22	Brown-gray sandy loam with red-tan sand inclusions.	Negative	
ST-62	3	23-67	Gray sandy loam with red-tan sand inclusions.	Negative	
ST-62	4	68-100	Gray clay loam.	Negative	
ST-63	1	0-10	Brown clay loam, root mat.	Negative	
ST-63	2	11-30	Brown-tan sandy loam.	Negative	
ST-63	3	31-56	Gray-tan sandy loam.	Negative	
ST-63	4	57-100	Gray sandy loam.	Negative	
ST-64	1	0-13	Dark brown sandy loam, organic.	Negative	
ST-64	2	14-22	Brown sandy loam with red-tan sand inclusions.	Negative	
ST-64	3	23-25	Red-tan sandy loam.	Negative	
ST-64	4	26-35	Gray sandy loam with red-tan sand inclusions.	Negative	
ST-64	5	36-81	Brown sandy loam with red-tan sand inclusions.	Negative	
ST-64	6	82-100	Gray sandy clay.	Negative	
ST-65	1	0-20	Brown clay loam, root mat.	Negative	
ST-65	2	21-51	Gray-tan sandy loam.	Negative	
ST-65	3	52-100	Gray sandy loam.	Negative	
ST-66	1	0-22	Dark brown sandy loam, organic.	Negative	
ST-66	2	23-81	Gray sandy loam with red-tan sand inclusions.	Negative	
ST-66	3	82-86	Red-tan sandy loam.	Negative	
ST-66	4	87-100	Dark gray sandy loam.	Negative	Water table at 100 cmbs

Eastern RSA Shovel Testing					
ST#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
ST-67	1	0-12	Brown clay loam, root mat.	Negative	
ST-67	2	13-41	Tan-gray sandy loam.	Negative	
ST-67	3	42-100	Gray sandy loam.	Negative	
ST-68	1	0-22	Dark brown sandy loam, organic.	Negative	
ST-68	2	23-100	Gray-brown sandy loam.	Negative	
ST-69	1	0-17	Brown clay loam.	Negative	
ST-69	2	18-39	Tan-gray sandy loam.	Negative	
ST-69	3	40-63	Tan-brown sandy loam.	Negative	
ST-69	4	64-100	Gray sandy loam.	Negative	
ST-70	1	0-18	Dark brown sandy loam, organic.	Negative	
ST-70	2	19-48	Gray-brown sand with red-tan sand inclusions.	Negative	
ST-70	3	49-100	Dark gray sandy loam.	Negative	Water table at 100 cmbs
ST-71	1	0-20	Brown loam.	Negative	
ST-71	2	21-45	Tan-gray sandy loam.	Negative	
ST-71	3	46-68	Tan-brown sandy loam.	Negative	
ST-71	4	69-100	Gray sandy loam.	Negative	Water table at 100 cmbs
ST-72	1	0-21	Dark brown sandy loam, organic.	Negative	
ST-72	2	22-100	Gray-brown sand with red-tan sand inclusions.	Negative	Water table at 100 cmbs
ST-73	1	0-16	Brown loam.	Negative	
ST-73	2	17-48	Tan-gray sandy loam.	Negative	
ST-73	3	49-65	Tan-brown sandy loam.	Negative	
ST-73	4	66-100	Gray sandy loam.	Negative	
ST-74	1	0-14	Dark brown sandy loam, organic.	Negative	
ST-74	2	15-70	Gray-brown sand with red-tan sand inclusions.	Negative	
ST-74	3	71-100	Gray sand with red-tan sand inclusions.	Negative	Water table at 100 cmbs
ST-75	1	0-17	Brown loam.	Negative	
ST-75	2	18-41	Tan-gray sandy loam.	Negative	

Eastern RSA Shovel Testing					
ST#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
ST-75	3	42-71	Tan-brown sandy loam	Negative	
ST-75	4	72-100	Gray sandy loam.	Negative	Water table at 100 cmbs
ST-76	1	0-5	Dark gray organic sandy loam with brown clay and brown natural organic inclusions.	Negative	
ST-76	2	6-45	Black organic sandy loam.	Negative	Peat layer? Water table at 45 cmbs
ST-77	1	0-16	Tan-brown clay loam, root mat.	Negative	
ST-77	2	17-44	Gray-tan sand with red-tan clay inclusions.	Negative	
ST-77	3	44-60	Black organic sandy loam.	Negative	Peat layer? Water table at 60 cmbs
ST-78	1	0-10	Dark brown sandy loam, organic.	Negative	
ST-78	2	11-18	Gray sandy loam.	Negative	
ST-78	3	19-22	Red-tan sandy loam.	Negative	
ST-78	4	23-36	Gray sandy loam.	Negative	
ST-78	5	37-43	Ret-tan sandy loam.	Negative	
ST-78	6	44-62	Gray sandy loam.	Negative	Water table at 62 cmbs
ST-79	1	0-15	Tan-brown clay loam, root mat.	Negative	
ST-79	2	16-20	Red-tan sandy loam with small gravels.	Negative	
ST-79	3	21-50	Gray-tan sandy loam with small gravels.	Negative	
ST-79	4	51-68	Gray-black fine-grained sandy loam.	Negative	Water table at 68 cmbs
ST-80	1	0-7	Tan-gray sandy loam, root mat.	Negative	
ST-80	2	8-30	Gray-tan sandy loam with small gravels.	Negative	
ST-80	3	31-100	Gray fine-grained sandy loam.	Negative	Water table at 100 cmbs
ST-81	1	0-5	Dark brown sandy loam, organic.	Negative	
ST-81	2	6-24	Light brown sandy loam.	Negative	
ST-81	3	25-38	Gray sandy loam.	Negative	Water table at 38 cmbs
ST-82	1	0-16	Tan-brown sandy loam, root mat.	Negative	
ST-82	2	17-52	Gray-tan coarse-grained sandy loam with small gravels.	Negative	
ST-82	3	53-100	Gray fine-grained sandy loam.	Negative	
ST-83	1	0-22	Dark brown sandy loam, organic.	Negative	

Eastern RSA Shovel Testing					
ST#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
ST-83	2	23-31	Gray sandy clay loam.	Negative	
ST-83	3	31-100	Light gray sandy loam with red-tan sand inclusions.	Negative	
ST-84	1	0-18	Tan-brown sandy loam, root mat.	Negative	
ST-84	2	19-59	Gray-tan coarse-grained sandy loam with small gravels.	Negative	
ST-84	3	60-100	Gray fine-grained sandy loam.	Negative	
ST-85	1	0-7	Brown-gray sandy loam with small gravels.	Negative	
ST-85	2	8-43	Gray sandy loam with small gravels.	Negative	Water table at 43 cmbs

APPENDIX B: AUGER PROBE NOTES

Northwest Development Area Auger Probing					
Auger Probe#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
AP-1	1	0-6	Dark brown organic clay loam, root mat.	Negative	
AP-1	2	7-100	Light brown sandy loam with small gravels.	Negative	
AP-2	1	0-3	Dark brown organic clay loam, root mat.	Negative	
AP-2	2	4-17	Light brown-gray sandy loam with small gravels.	Negative	Could not auger through the gravel.
AP-3	1	0-2	Dark brown organic clay loam, root mat.	Negative	
AP-3	2	3-45	Light brown sandy loam with small gravels.	Negative	Could not auger through the gravel.
AP-4	1	0-6	Dark brown organic clay loam, root mat.	Negative	
AP-4	2	7-30	Light brown sandy loam with small gravels.	Negative	
AP-4	3	31-100	Light gray sandy loam.	Negative	Water table at 100 cmbs.
AP-5	1	0-3	Dark brown organic clay loam, root mat.	Negative	
AP-5	2	3-17	Gray sandy loam with small gravels.	Negative	Could not auger through the gravel.
AP-6	1	0-3	Dark brown organic clay loam, root mat.	Negative	
AP-6	2	4-13	Gray clay loam.	Negative	
AP-6	3	14-90	Gray sandy loam.	Negative	
AP-6	4	91-100	Light brown sandy loam.	Negative	Water table at 100 cmbs.
AP-7	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-7	2	5-95	Gray sandy loam.	Negative	Water table at 95 cmbs.
AP-8	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-8	2	5-100	Gray sand.	Negative	
AP-9	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-9	2	5-22	Gray sand.	Negative	Water table at 22 cmbs.
AP-10	1	0-5	Dark brown organic clay loam, root mat.	Negative	
AP-10	2	6-100	Gray sand.	Negative	
AP-11	1	0-3	Dark brown organic clay loam, root mat.	Negative	
AP-11	2	3-60	Gray clay loam.	Negative	
AP-11	3	61-100	Dark gray clay loam.	Negative	
AP-12	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-12	2	5-60	Gray clay loam.	Negative	

Northwest Development Area Auger Probing					
Auger Probe#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
AP-13	1	0-3	Dark brown organic clay loam, root mat.	Negative	
AP-13	2	4-15	Dark clay loam.	Negative	
AP-13	3	15-40	Light brown sandy loam with small gravels.	Negative	Could not auger through the gravel.
AP-14	1	0-2	Dark brown organic clay loam, root mat.	Negative	
AP-14	2	3-26	Light brown sandy loam with small gravels.	Negative	Could not auger through the gravel.
AP-15	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-15	2	4-7	Light brown sandy loam with small gravels.	Negative	Could not auger through the gravel.
AP-16	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-16	2	4-20	Light brown sandy loam with small gravels.	Negative	Could not auger through the gravel.
AP-17	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-17	2	4-26	Light brown sandy loam with small gravels.	Negative	
AP-18	1	0-3	Dark brown organic clay loam, root mat.	**Positive**	Styroform
AP-18	2	3-100	Light brown sandy loam.	Negative	
AP-19	1	0-3	Dark brown organic clay loam, root mat.	Negative	
AP-19	2	4-18	Light gray sandy loam.	Negative	
AP-19	3	19-40	Light gray clay loam.	Negative	
AP-19	4	41-100	Light gray sandy loam.	Negative	Water table at 95 cmbs.
AP-20	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-20	2	5-30	Light brown sandy loam.	Negative	
AP-20	3	31-100	Light gray sandy loam.	Negative	Water table at 100 cmbs.
AP-21	1	0-7	Dark brown organic clay loam, root mat.	Negative	
AP-21	2	8-42	Light brown sandy loam.	Negative	
AP-21	3	43-47	Brown sand with gravels.	Negative	Hit dense gravels at 43 cmbs could not auger past 47 cmbs.
AP-22	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-22	2	4-89	Light gray sandy loam.	Negative	Water table at 81 cmbs
AP-23	1	0-5	Dark brown organic clay loam, root mat.	Negative	
AP-23	2	6-83	Light gray sandy loam.	Negative	
AP-23	3	84-90	Light brown sand with small gravels.	Negative	Could not auger through the gravel.
AP-24	1	0-5	Dark brown organic clay loam, root mat.	Negative	
AP-24	2	6-100	Light brown sandy loam with small gravels.	Negative	

Northwest Development Area Auger Probing					
Auger Probe#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
AP-25	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-25	2	5-38	Light gray sandy loam with small gravels.	Negative	Could not auger through the gravel.
AP-26	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-26	2	5-12	Light gray sandy loam.	Negative	
AP-26	3	13-31	Light brown sand with small gravels.	Negative	Could not auger through the gravel.
AP-27	1	0-10	Dark brown organic clay loam, root mat.	Negative	
AP-27	2	11-35	Light gray clay loam.	Negative	
AP-27	3	36-66	Light brown sandy loam with small gravels.	Negative	Could not auger through the gravel.
AP-28	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-28	2	4-100	Gray clay loam.	Negative	Water table at 100 cmbs.
AP-29	1	0-3	Dark brown organic clay loam, root mat.	Negative	
AP-29	2	4-60	Gray sandy loam with small gravels.	Negative	Could not auger through the gravel.
AP-30	1	0-2	Dark brown organic clay loam, root mat.	Negative	
AP-30	2	3-43	Gray sandy loam with small gravels.	Negative	Could not auger through the gravel.
AP-31	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-31	2	5-10	Light gray clay loam.	Negative	
AP-31	3	11-55	Gray sandy loam with small gravels.	Negative	Could not auger through the gravel.
AP-32	1	0-5	Dark brown organic clay loam, root mat.	Negative	
AP-32	2	6-21	Light gray clay loam.	Negative	
AP-32	3	22-60	Gray sandy loam with small gravels.	Negative	Could not auger through the gravel.
AP-33	1	0-2	Dark brown organic clay loam, root mat.	Negative	
AP-33	2	3-50	Light brown sandy clay loam.	Negative	
AP-33	3	51-61	Light gray clay loam.	Negative	
AP-33	4	61-67	Gray sandy loam with small gravels.	Negative	Could not auger through the gravel.
AP-34	1	0-10	Dark brown organic clay loam, root mat.	Negative	
AP-34	2	11-55	Light brown clay.	Negative	
AP-34	3	56-70	Light brown sandy loam with small gravels.	Negative	Could not auger through the gravel.
AP-35	1	0-2	Dark brown organic clay loam, root mat.	Negative	
AP-35	2	3-20	Light gray sandy loam with small gravels.	Negative	
AP-35	3	21-100	Light brown clay loam.	Negative	Hit gravel at 100 cmbs.
AP-36	1	0-5	Dark brown organic clay loam, root mat.	Negative	

Northwest Development Area Auger Probing					
Auger Probe#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
AP-36	2	6-20	Light brown sandy loam with small gravels.	Negative	
AP-36	3	21-30	Gray clay loam.	Negative	
AP-36	4	31-90	Light gray sandy loam with small gravels.	Negative	
AP-36	5	91-100	Light brown sandy loam with small gravels.	Negative	Water table at 100 cmbs.

Western Runway Safety Area/Wildlife Hazardous Management Plan Area Auger Probing					
Auger Probe#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
AP-37	1	0-10	Dark brown organic clay loam, root mat.	Negative	
AP-37	2	11-28	Dark brown clay loam with small gravels.	Negative	Water table at 28 cmbs.
AP-38	1	0-6	Dark brown clay loam.	Negative	
AP-38	2	7-31	Dark brown clay loam with small gravels.	Negative	Water table at 31 cmbs.
AP-39	1	0-8	Dark brown organic clay loam, root mat.	Negative	
AP-39	2	9-48	Brown sandy loam.	Negative	
AP-39	3	49-62	Dark brown clay loam with small gravels.	Negative	Water table at 62 cmbs.
AP-40	1	0-10	Dark brown organic clay loam, root mat.	Negative	
AP-40	2	11-36	Brown sandy loam.	Negative	
AP-40	3	37-40	Gray clay loam.	Negative	
AP-40	4	41-51	Gray clay loam.	Negative	
AP-40	5	52-56	Red clay with small gravels.	Negative	
AP-40	6	56-58	Dark brown clay loam with small gravels.	Negative	Water table at 58 cmbs.
AP-41	1	0-5	Dark brown organic clay loam, root mat.	Negative	
AP-41	2	6-30	Brown sandy loam.	Negative	
AP-41	3	31-34	Dark brown clay loam with small gravels.	Negative	Could not auger past gravel.
AP-42	1	0-5	Dark brown organic clay loam, root mat.	Negative	
AP-42	2	6-18	Dark gray sandy loam.	Negative	
AP-42	3	19-33	Gray clay loam.	Negative	
AP-42	4	34-37	Dark brown clay loam with small gravels.	Negative	Could not auger past gravel.
AP-43	1	0-6	Dark brown organic clay loam, root mat.	Negative	
AP-43	2	7-28	Gray sandy clay loam.	Negative	
AP-43	3	29-31	Red-brown clay loam with small gravels.	Negative	Water table at 31 cmbs.

Eastern RSA Auger Probing					
Auger Probe#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
AP-44	1	0-16	Dark brown organic clay loam, root mat.	Negative	
AP-44	2	17-127	Gray-brown sandy loam.	Negative	Water table at 127 cmbs.
AP-45	1	0-21	Dark brown organic clay loam, root mat.	Negative	
AP-45	2	22-100	Gray-brown sandy loam.	Negative	
AP-46	1	0-13	Dark brown organic clay loam, root mat.	Negative	
AP-46	2	14-17	Dark brown clay loam.	Negative	
AP-46	3	18-20	Red-Brown sandy loam.	Negative	
AP-46	4	21-40	Gray clay loam.	Negative	
AP-46	5	41-100	Light gray sandy loam.	Negative	Water table at 100 cmbs.
AP-47	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-47	2	4-20	Gray sandy clay loam.	Negative	
AP-47	3	20-101	Light gray sandy loam.	Negative	
AP-48	1	0-5	Dark brown organic clay loam, root mat.	Negative	
AP-48	2	5-25	Gray sandy clay loam.	Negative	
AP-48	3	25-80	Gray-orange sandy clay loam.	Negative	
AP-48	4	80-102	Light gray sandy loam.	Negative	
AP-49	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-49	2	4-12	Gray sandy clay loam.	Negative	
AP-49	3	12-80	Gray-orange sandy clay loam.	Negative	
AP-49	4	80-100	Light gray sandy loam.	Negative	
AP-50	1	0-2	Dark brown organic clay loam, root mat.	Negative	
AP-50	2	2-30	Gray sandy clay loam.	Negative	
AP-50	3	30-100	Light gray sandy loam.	Negative	Water table at 100 cmbs.
AP-51	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-51	2	4-25	Gray sandy clay loam.	Negative	
AP-51	3	25-80	Gray-orange sandy clay loam.	Negative	
AP-51	4	80-100	Light gray sandy loam.	Negative	
AP-52	1	0-12	Dark brown organic clay loam, root mat.	Negative	
AP-52	2	12-30	Gray-orange sandy loam.	Negative	
AP-52	3	30-67	Light gray sandy loam.	Negative	Water table at 67 cmbs.
AP-53	1	0-8	Dark brown organic clay loam, root mat.	Negative	

Eastern RSA Auger Probing					
Auger Probe#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
AP-53	2	8-45	Light gray sandy loam.	Negative	
AP-53	3	45-70	Dark gray sandy loam.	Negative	Water table at 70 cmbs.
AP-54	1	0-12	Dark brown organic clay loam, root mat.	Negative	
AP-54	2	12-80	Light gray sandy loam.	Negative	
AP-54	3	80-87	Dark gray sandy loam.	Negative	Water table at 87 cmbs.
AP-55	1	0-12	Dark brown organic clay loam, root mat.	Negative	
AP-55	2	12-30	Light gray sandy loam.	Negative	
AP-55	3	30-79	Dark gray sandy loam.	Negative	Water table at 79 cmbs.
AP-56	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-56	2	4-30	Gray clay loam.	Negative	
AP-56	3	30-65	Gray-orange sandy clay loam.	Negative	
AP-56	4	65-93	Light gray sandy loam.	Negative	Water table at 93 cmbs.
AP-57	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-57	2	4-8	Dark brown clay loam.	Negative	
AP-57	3	8-60	Gray-orange sandy clay loam.	Negative	
AP-57	4	60-70	Light gray sandy loam.	Negative	
AP-57	5	70-77	Dark gray sandy loam.	Negative	Water table at 77 cmbs.
AP-58	1	0-5	Dark brown	Negative	
AP-58	2	5-20	Dark brown clay loam.	Negative	
AP-58	3	20-87	Gray-orange sandy clay loam.	Negative	Water table at 87 cmbs.
AP-59	1	0-3	Dark brown organic clay loam, root mat.	Negative	
AP-59	2	3-8	Dark brown clay loam.	Negative	
AP-59	3	8-55	Gray-orange sandy clay loam.	Negative	
AP-59	4	55-67	Dark gray sandy loam.	Negative	Water table at 67 cmbs.
AP-60	1	0-3	Dark brown organic clay loam, root mat.	Negative	
AP-60	2	3-20	Gray-orange sandy clay loam.	Negative	
AP-60	3	20-75	Dark gray sandy loam.	Negative	Water table at 75 cmbs.
AP-61	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-61	2	4-20	Dark gray sandy clay loam.	Negative	
AP-61	3	20-67	Dark gray sandy loam.	Negative	Water table at 67 cmbs.
AP-62	1	0-10	Dark brown organic clay loam, root mat.	Negative	

Eastern RSA Auger Probing					
Auger Probe#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
AP-62	2	10-15	Dark gray clay loam.	Negative	
AP-62	3	15-40	Gray-orange sandy clay loam.	Negative	
AP-62	4	40-59	Dark gray sandy loam.	Negative	Water table at 55 cmbs.
AP-63	1	0-10	Dark brown organic clay loam, root mat.	Negative	
AP-63	2	10-25	Dark gray clay loam.	Negative	
AP-63	3	25-85	Gray-orange sandy clay loam.	Negative	
AP-63	4	85-90	Dark gray sandy loam.	Negative	Water table at 90 cmbs
AP-64	1	0-8	Dark brown organic clay loam, root mat.	Negative	
AP-64	2	8-25	Gray sandy clay loam.	Negative	
AP-64	3	25-105	Gray-orange sandy clay loam.	Negative	
AP-65	1	0-10	Dark brown organic clay loam, root mat.	Negative	
AP-65	2	10-75	Gray-orange sandy clay loam.	Negative	
AP-65	3	75-85	Dark gray sandy loam.	Negative	Water table at 85 cmbs.
AP-66	1	0-2	Dark brown organic clay loam, root mat.	Negative	
AP-66	2	2-75	Brown sandy loam.	Negative	
AP-66	3	75-86	Gray-orange sandy loam.	Negative	Water table at 86 cmbs.
AP-67	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-67	2	4-61	Gray-orange sandy loam.	Negative	Water table at 61 cmbs.
AP-68	1	0-6	Dark brown organic clay loam, root mat.	Negative	
AP-68	2	6-59	Light gray sandy loam.	Negative	Water table at 59 cmbs.
AP-69	1	0-5	Dark brown organic clay loam, root mat.	Negative	
AP-69	2	5-8	Light gray sandy loam with small gravels.	Negative	
AP-69	3	8-78	Light gray sandy loam.	Negative	Water table at 78 cmbs.
AP-70	1	0-100	Light gray sandy loam.	Negative	
AP-71	1	0-5	Dark brown organic clay loam, root mat.	Negative	
AP-71	2	5-15	Gray-orange clay loam.	Negative	
AP-71	3	15-100	Light gray sandy loam.	Negative	
AP-72	1	0-5	Dark brown organic clay loam, root mat.	Negative	
AP-72	2	5-100	Light gray sandy loam.	Negative	
AP-73	1	0-10	Dark brown organic clay loam, root mat.	Negative	
AP-73	2	10-12	Gray-orange clay loam.	Negative	

Eastern RSA Auger Probing					
Auger Probe#	**Level**	**Depth (cmbs)**	**Soil Description**	**Cultural Material (Positive or Negative)**	**Comments**
AP-73	3	12-45	Light gray sandy loam.	Negative	Water table at 45 cmbs.
AP-74	1	0-100	Light gray sandy loam with small gravels.	Negative	
AP-75	1	0-4	Dark brown organic clay loam, root mat.	Negative	
AP-75	2	4-45	Gray sand with small gravels.	Negative	Most likely fill from runway.
AP-75	3	45-100	Light gray sandy loam.	Negative	