



Cultural Resources Technical Report
Moffett Towers II 5th Ave Reclaimed Water Line Tie-In to Main Line
at Moffett Property Project, Santa Clara County, California

Submitted to:

NASA

On behalf of:

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Technical Report 19-201

August 29, 2019

CULTURAL RESOURCES TECHNICAL REPORT
MOFFETT TOWERS II 5TH AVE RECLAIMED WATER LINE TIE-IN
TO MAIN LINE AT MOFFETT PROPERTY PROJECT
SANTA CLARA COUNTY, CALIFORNIA

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Prepared for:
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Technical Report No. 19-201

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MANAGEMENT SUMMARY

Moffett Towers II, LLC, proposes the tie-in of an existing 8-inch recycled water line from the Moffett Towers II project area to an existing 18-inch public recycled water line on the east side of the Moffett Federal Airfield property in Santa Clara County, California. Because the tie-in project is located on federal land, it constitutes an undertaking as defined by 36 CFR 800.16(y) and is thus subject to Section 106 of the National Historic Preservation Act (NHPA). The National Aeronautics and Space Administration (NASA) is the Lead Agency for the purposes of the Section 106.

This cultural resources report summarizes the methods and results of cultural resources investigation of the project Area of Potential Effects (APE). This investigation included background research, communication with the Native American Heritage Commission (NAHC) and interested Native American tribal groups, and an intensive pedestrian survey of the APE. The purpose of the survey was to identify any cultural resources that may be impacted by the project and then determine whether the resources qualify for listing on the National Register of Historic Places (NRHP).

NASA has previously conducted an Archaeological Resources Study of the NASA Ames Research Center (ARC) and assessed the archaeological sensitivity for the Moffett Federal Airfield (AECOM 2017). The document serves as a baseline study for the future investigation and treatment of archaeological resources at ARC and was referenced for this study.

A cultural resource records search and literature review was conducted as part of the Archaeological Resource Study (AECOM 2017). The records search indicated that one previous study crossed the APE; however, no cultural resources have been documented within the APE.

As part of the cultural resources inventory of the APE, PaleoWest also requested a search of the Sacred Lands File (SLF) from the NAHC. Results of the SLF search indicate that there are no known Native American cultural resources within the APE but suggested contacting six Native American tribal groups to find out if they have additional information about resources in the project area. Six individuals were contacted, and one response was received. Mr. Andrew Galvin, of the Ohlone Indian Tribe mentioned the presence of archaeological site CA-SCL-12/H to the south of the APE and requested a copy of the cultural resources technical report for this project, including recommendations.

PaleoWest conducted an intensive pedestrian survey of the APE on April 4, 2019. No cultural resources were identified during the survey. In addition, no archaeological resources were encountered during installation of the adjacent extant recycled water lines. As such, a finding of "No Historic Properties Affected" pursuant to 36 CFR Part 800.4(d)(1) is recommended for the proposed undertaking as the identification efforts discussed in this report identified no archaeological resources/historic properties in the APE.

1.0 INTRODUCTION

Moffett Towers II, LLC, proposes the construction of a tie-in between an existing 8-inch recycled water line from the Moffett Towers II project area to an existing 18-inch public recycled water line on the east side of the Moffett Federal Airfield property in Santa Clara County, California. Because the tie-in project is located on federal land, it constitutes an undertaking as defined by 36 Code of Federal Regulations (CFR) 800.16(y) and is thus subject to Section 106 of the National Historic Preservation Act (NHPA). PaleoWest Archaeology (PaleoWest) was contracted by Moffett Towers II to conduct an archaeological survey of the Area of Potential Effects (APE) for the undertaking. The National Aeronautics and Space Administration (NASA) is the Lead Agency for the purposes of the Section 106.

1.1 PROJECT LOCATION AND DESCRIPTION

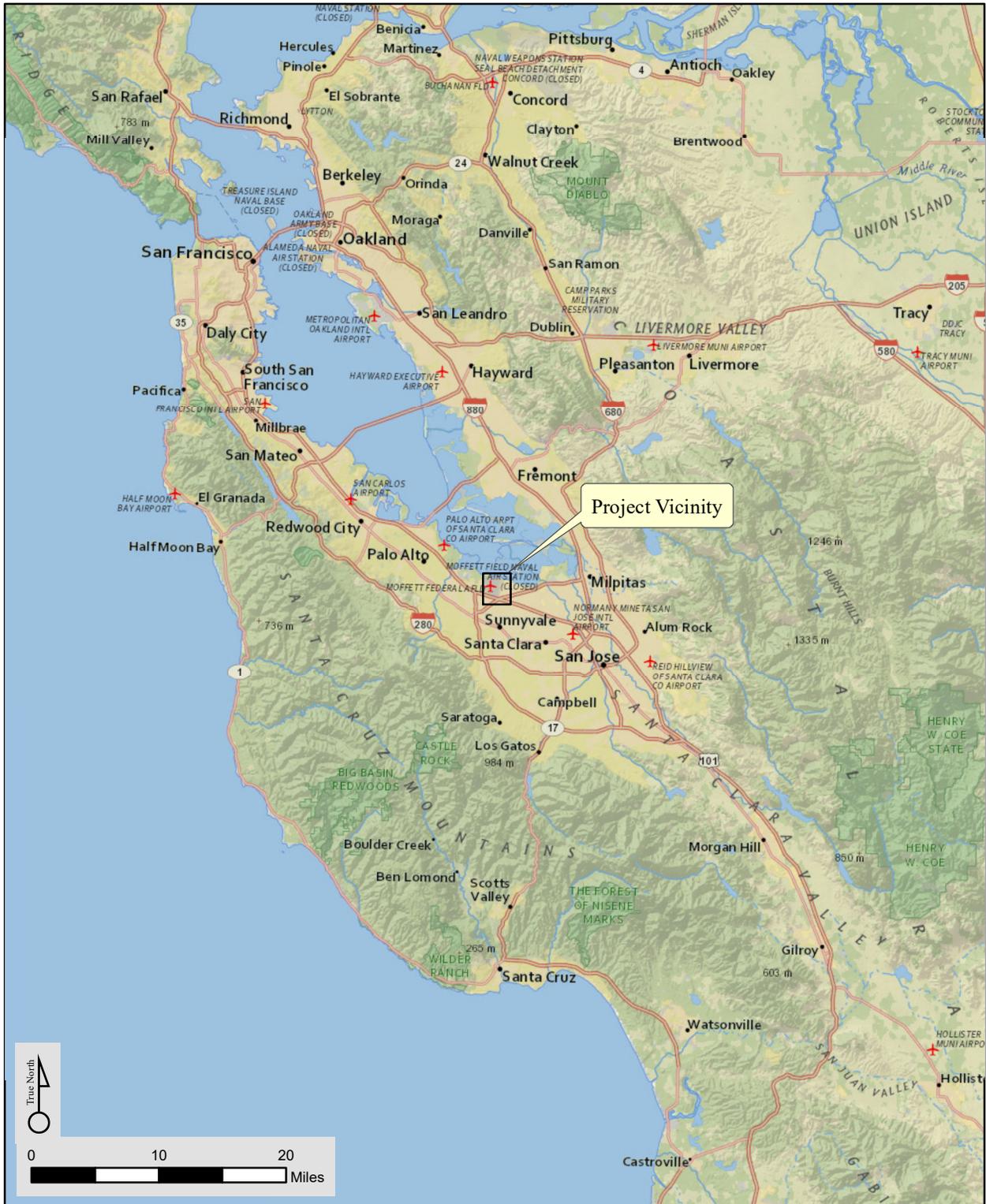
Moffett Towers II, LLC, proposes the tie-in of an already installed, 8-inch recycled water line from the Moffett Towers II project area to an existing 18-inch public recycled water line on the east side of the Moffett Federal Airfield property in Santa Clara County, California (Figures 1-1 to 1-3). The APE is situated within unsectioned land, Township 6 South, Range 2 West, Mount Diablo Baseline and Meridian (MDBM), as depicted on the Mountain View, CA 7.5' U.S. Geological Survey (USGS) topographic quadrangle. The elevation of the APE is approximately 37 feet above mean sea level (amsl).

NASA previously conducted an Archaeological Resources Study of NASA Ames Research Center (ARC) that assessed the archaeological sensitivity for the ARC property (AECOM 2017). The State Historic Preservation Officer (SHPO) reviewed the document in June of 2017 and found the conclusions of the study to be acceptable and adequate for the proposed future uses as a baseline for investigation and treatment of archaeological resources at ARC. The 2017 study identified the current undertaking as entirely within an area of low archaeological sensitivity (AECOM 2017: 58, Figure 16).

1.2 AREA OF POTENTIAL EFFECTS (APE) DESCRIPTION

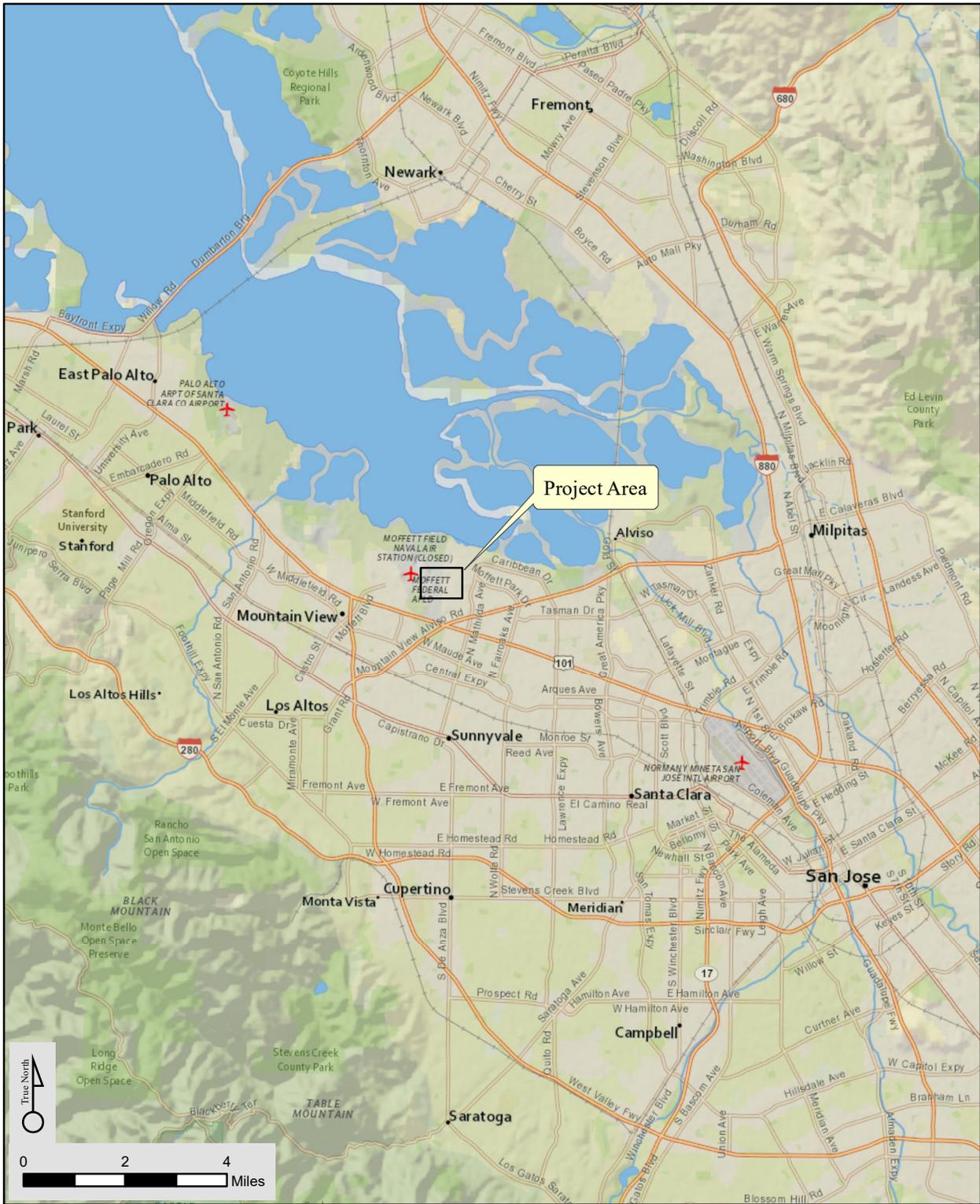
The APE for the undertaking designates the area that will experience direct impacts from the water line tie-in construction. The tie-in is located on ARC property adjacent to the existing 8-inch recycled water line, which was installed on private property in September 2017 (Figure 1-4). The horizontal APE includes the tie-in area, a small trapezoidally shaped area of approximately 300 square feet in size that lies immediately west of the cyclone fence line that marks the eastern boundary of the ARC, and the terminus of the existing 8-inch recycled water line. The horizontal APE includes the area of excavation plus a surrounding work area. The vertical APE corresponds directly to the depth of disturbance that is required to tie-in the recycled water line. The maximum depth of excavation for the undertaking will be no more than 4 feet. The

proposed alignment and the excavated depth along it constitute the APE as depicted in Figure 1-4.



Project Vicinity Map

Figure 1-1
Moffett Towers II Project
Santa Clara County, CA



Project Area Map

Figure 1-2
Moffett Towers II Project
Santa Clara County, CA



Project Location

Figure 1-3
Moffett Towers II Project
Santa Clara County, CA

The following content was redacted from this public posting:

Horizontal and Vertical APE Map

1.3 REPORT ORGANIZATION

This report documents the results of a cultural resources investigation conducted for the proposed undertaking. Chapter 1 has introduced the project location and description, including a discussion of the horizontal and vertical APE. Chapter 2 presents the regulatory context for the undertaking. Drawing heavily on the sensitivity analysis in the AECOM (2017) report, Chapter 3 synthesizes the natural and cultural setting of the area and surrounding region in which the APE is located, previous investigations including NAHC coordination are provided. An explanation of the archaeological survey methodology and results are outlined in Chapter 4 with management recommendation provided in Chapter 5. This is followed by bibliographic references and appendices.

2.0 REGULATORY CONTEXT

2.1 SECTION 106 OF NHPA

Section 106 of the 1966 National Historic Preservation Act (NHPA), as amended, requires that any federal project, federally assisted project, or any project requiring federal licensing or permitting consider the effect of the undertaking on historic properties. Because the water line installation is partially located on Federal property, it constitutes an undertaking as defined by 36CFR800.16(y) and is thus subject to Section 106 of NHPA. The first step in the process is to identify any archaeological resources that may be impacted by the project and then determine whether the resources qualify as historical places worthy of preservation as listed in the National Register of Historic Places (NRHP).

The NRHP, created under the NHPA, is the federal list of historic, archaeological, and cultural resources worthy of preservation and is maintained and expanded by the National Park Service on behalf of the Secretary of the Interior. The Office of Historic Preservation in Sacramento, California, administers the local NRHP program under the direction of the State Historic Preservation Officer (SHPO). Resources listed in the NHRP include districts, sites, buildings, structures, and objects that are significant in American history, prehistory, architecture, archaeology, engineering, and culture.

To guide the selection of properties eligible for inclusion in the NRHP, the National Park Service has developed the NRHP Criteria for Evaluation. The criteria are standards by which every property that is nominated to the NRHP is judged. The quality of significance in American history, architecture, archaeology, and culture is possible in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association and that meet one of the following criteria:

Criterion A: A property is associated with events that have made a significant contribution to the broad patterns of our history; or

Criterion B: A property is associated with the lives of persons significant in our past; or

Criterion C: A property embodies the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possesses high artistic values, or that represents a significant and distinguishable entity whose components make lack individual distinction; or

Criterion D: A property has yielded, or may be likely to yield, information important in prehistory or history (36 CFR Part 60).

All categories of properties—districts, sites, buildings, structures, and objects—may be judged in relation to any or all these criteria. Typically, the eligibility to the NRHP of archaeological

properties is determined by application of Criterion D, which evaluates the importance of the information the property might contain. Archaeological sites can also be eligible under Criteria A, B and C, which assess the intrinsic value that a property possesses either by its historical association with an important person or event or as a surviving example of an important type of property. To determine the importance of the information a property might contain (i.e., does it meet Criterion D?), a historic context or setting is provided in light of which any given find can be judged using the NRHP eligibility criteria. The historical context is also used to establish a period of significance and possible historical associations.

3.0 SETTING

This section of the report summarizes information regarding the physical and cultural setting of the APE, including the prehistoric, ethnographic, and historic contexts of the general area. Several factors, including topography, available water sources, and biological resources, affect the nature and distribution of prehistoric, ethnographic, and historic-period human activities in an area. This background provides a context for understanding the nature of the archaeological resources that may be identified within the APE. For a more detailed discussion of the context and archaeological sensitivity of the ARC property see AECOM's Archaeological Resources Study (AECOM 2017).

3.1 ENVIRONMENTAL SETTING

The APE is located on the southern portion of the San Francisco Peninsula, which lies along the southwest boundary of the San Francisco Bay. The area ecology, though heavily impacted by dense urban and military development, is coastal littoral, which consists of land strips along the coast that are characterized by a series of microenvironments including estuaries, bays, marshes, and grassy terraces (Chartkoff and Chartkoff 1984). Common vegetation throughout the area includes valley oak (*Quercus lobata*), live oak (*Quercus agrifolia*), California buckeye (*Aesculus californica*), California bay laurel (*Umbellularia californica*), star thistle (*Centaurea solstitialis*), wild oats (*Avena fatua*), morning glories (*Convolvulus*), lupine (*Lupinus*), poppies (*Papaver*), wild artichokes (*Cynara scolymus*), and various other native and imported grasses. Animal life within the region is diverse. While animals such as pronghorn sheep, antelope, tule elk, mule deer, black-tail deer, and grizzly bear occupied the area throughout prehistory, the region today favors small, herbivorous mammals, especially voles, pocket gophers, ground squirrels, and pocket mice (Brown 1985). The few larger, open areas in the region attract some larger animals including deer, rabbit, skunk, opossum, raccoon, and a variety of birds including red-tailed hawks and turkey vultures.

3.2 DEPOSITIONAL SETTING

Around 15,000 years ago the global sea level was more than 300 feet (91 meters) lower than present levels. As ice sheets melted, sea levels rose substantially. Between 15,000 and 11,000 years ago, sea levels rose at a rate of approximately 43 feet (13 meters) every 1,000 years (Masters and Aiello 2007; Moratto 1984). Prior to the infilling of the San Francisco Bay, the ARC property would have been part of the diverse riparian and upland topography within the Franciscan Valley (AECOM 2017).

As the Bay formed, new tidal estuarine environments were created as riparian corridors and valley floors were filled with water. This newly formed estuary expanded rapidly, approaching current levels by approximately 6,000 years ago, when the sea level rise largely subsided.

Between 6,000 years ago and present day, the sea level has risen an average rate of about 4 feet (± 1 meter) every 1,000 years. During this period, the ARC area started to resemble the geomorphic and ecological setting that is seen today (AECOM 2017).

With rising sea levels, drainages retreated upslope and deposited alluvium over previously exposed land surfaces. As sea levels stabilized, alluvium accumulated. As a result, formerly stable Pleistocene and early Holocene land surfaces near San Francisco Bay are now covered by thick alluvium largely deposited in the last 6,000 years (Helley et al. 1979). These older buried land surfaces are often marked by well-developed paleosols that have the potential to harbor early prehistoric archaeological sites. The middle to late Holocene alluvium overlying these formerly stable land surfaces has accumulated up to 33 feet (10 meters) thick in some locations around the Bay region (Meyer 2004). In addition, the younger Holocene alluvium often contains several paleosols, which mark periods of stability between episodic depositions (AECOM 2017).

Pleistocene surfaces buried immediately below younger Holocene deposits do have a potential for containing archaeological deposits. But paleosols within Holocene-age landforms are of interest because they have a greater potential for preserving archaeological deposits. The ARC area is characterized by a very gently sloping Holocene alluvial landform where prehistoric archaeological sites have been found (AECOM 2017).

Soils in ARC are dominated (>70%) by Hangerone complex series soils (AECOM 2017). Hangerone series soils are organic-rich clay soils formed in poorly drained basin environments with high calcium carbonate accumulation (NRCS 2016). Other minor soils mapped within ARC are also dominated by hydric basin soils (e.g., Embarcadero series) or marsh soils (e.g., Novato series). All of these basin soils would have started to form when sea levels began to stabilize in the late Holocene. In general, wet basin soils in the northern Santa Clara valley are not conducive to human occupation, as they were wet for large portions of the year. However, buried sites in the Santa Clara Valley have been identified on slight topographic highs (e.g., natural levees) adjacent to basin soils (AECOM 2017).

The typical soil profile description for the Hangerone series includes a buried soil (paleosol) between 6 and 7.5 feet (1.8 to 2.3 meters) below surface. Recent geoarchaeological investigations identified paleosols within areas mapped as Hangerone and associated soil series (URS 2014, 2013). However, the age of this paleosol, and the age of the overlying surface alluvial unit, indicates that there is a reduced archaeological sensitivity for the Hangerone soil series in the vicinity of ARC (AECOM 2017).

No geomorphological studies have been conducted along the eastern boundary of the ARC property, but the depositional context of the APE is assumed to be similar to the western half of the ARC where several geomorphological studies have occurred. For a more detailed discussion see AECOM 2017.

3.3 PREHISTORIC SETTING

The evidence for the prehistoric archaeology in the Bay Area begins at around 8000 B.C. The latest chronological sequence developed for the Bay Area is Milliken et al. (2007) which combines the Early-Middle-Late Period temporal sequence with a pattern-aspect-phase cultural sequence. Following Fredrickson (1973, 1974, 1994), Milliken et al. (2007) define patterns as “units of culture marked by distinct underlying economic modes, technological adaptations, and

ceremonial practices.” The aspect is defined as a local variation in a major economic pattern, with a sequence of phases within a district representing an aspect. Following Willey and Phillips (1958), phases represent the smallest units of related site components “spatially limited to the order of magnitude of a locality or region and chronologically limited to a relatively brief interval of time” (Milliken et al. 2007).

Milliken et al.’s (2007) San Francisco Bay Area Cultural Sequence includes:

- Early Holocene (Lower Archaic) from 8000 to 3500 B.C.
- Early Period (Middle Archaic) from 3500 to 500 B.C
- Lower Middle Period (Initial Upper Archaic) from 500 B.C. to A.D. 430
- Upper Middle Period (Late Upper Archaic) from A.D. 430 to 1050
- Initial Late Period (Lower Emergent) from A.D. 1050 to 1550
- Terminal Late Period, post-A.D. 1550

Milliken et al. (2007) posit that the lack of evidence for occupation prior to 8000 B.C. is related to subsequent environmental changes that submerged sites, buried sites beneath alluvial deposits, or destroyed sites through stream erosion. A summary of the approach presented by Milliken et al. (2007) follows.

Beginning around 3500 B.C., evidence of sedentism, interpreted to signify a regional symbolic integration of peoples, and increased regional trade, emerges in the form of new ground stone technology and the introduction of cut-shell beads into burial contexts (Milliken et al. 2007:114). This Early Period lasted until ca. 500 B.C. The earliest mortar and pestles found so far date to post-4000 B.C., with wood mortars dating to 3800 B.C. By 1500 B.C., mortars and pestles replaced milling slabs and handstones at some sites. Sedentism or semi-sedentism is in evidence during this period in the form of burial complexes with associated ornamental grave goods and house floors with postholes (Milliken et al. 2007; Price et al. 2006).

Milliken et al. (2007) identify “a major disruption in symbolic integration systems” circa 500 B.C., marking the beginning of the Lower Middle Period (500 B.C. to A.D. 430). Changes included the disappearance of rectangular shell beads and introduction of split-beveled and small saucer Olivella beads (inferred to represent some of the earliest religious artifacts), which appear around the Early/Middle Transition bead horizon. The Upper Middle Period (A.D. 430 to 1050) is marked by the collapse of the Olivella saucer bead trade in central California, an increase in the occurrence of sea otter bones in those sites that were not abandoned.

The Initial Late Period, dating from A.D. 1050 to 1550, is characterized by increased manufacture of status objects. Fredrickson (1973 and 1994, quoted in Milliken et al. 2007) noted evidence for increased sedentism, the development of ceremonial integration, and status ascription. The beginning of the Late Period (ca. A.D. 1000) is marked by the Middle/Late Transition bead horizon. Well-fashioned “show” mortars, new Olivella bead forms, and a variety of Haliotis ornaments with multiperforated and bar-scored forms appear during this period. These new artifact forms are reflective of the beginning of the Augustine Pattern, while those features of the classic Augustine Pattern, such as the arrow, banjo effigy ornaments, the flanged pipe, and Olivella callus cup beads (post-A.D. 1250). Coincident with the introduction of the bow and arrow, Napa Valley obsidian manufacturing debitage increased markedly, while there was a

striking decrease in biface manufacture and debitage at Napa Valley Glass Mountain quarries. Local Franciscan chert continued to be used and completed obsidian projectile points were traded in from the north. Social stratification is evident in the introduction or, in some areas, reintroduction of partial cremations with high-status grave goods. In addition, the variety of status goods included in interments and in association with cremations of high-status individuals increased (Milliken et al. 2007).

Olivella sequin and cup beads disappear circa A.D. 1500 to 1550, marking the beginning of the Terminal Late Period. Clamshell disk beads were traded across the North Bay during this period, although there is no evidence that they spread south of the Carquinez Strait at this time. The earliest clamshell disks south of the Carquinez Strait date to A.D. 1670. Sometime between A.D. 1500 and 1650, fewer beads appear as grave goods, and only Olivella lipped and spire-lopped beads appear in interments. Other changes occurred around the San Francisco Bay Area during this period. Clamshell disk beads, magnetite tube beads, the toggle harpoon, hopper mortars, plain, corner-notched, arrow-sized, projectile points, and secondary cremation initially appear in the North Bay during the Terminal Late Period. Plain corner-notched projectile points began appearing and desert side-notched points spread from the Central Coast into the South Bay (Milliken et al. 2007).

3.4 ETHNOGRAPHIC SETTING

The APE is in a region that was occupied by the Ohlone or Costanoan group of Native Americans at the time of historic contact with Europeans (Kroeber 1925). Based on linguistic evidence, it has been suggested that the ancestors of the Ohlone arrived in the San Francisco Bay area about 1,500 years ago, having moved south and west from the Sacramento-San Joaquin Delta region. The ancestral Ohlone displaced speakers of a Hokan language and were probably the producers of the artifact assemblages that constitute the Augustine pattern described above (Levy 1978).

The Ohlone utilized the marine and riverine resources of the San Francisco Bay and nearby creeks. These areas were important sources for seasonal foods such as migratory waterfowl and shorebirds, which provided protein-rich supplements to the typical aboriginal diet of greens, roots and bulbs, seeds, and acorns, as well as fish (Levy 1978). Mussels were an important staple in the Ohlone diet as were acorns of the coast live oak, valley oak, tanbark oak, and California black oak. Seeds and berries, roots and grasses, as well as the meat of deer, elk, grizzly, rabbit, and squirrel formed the Ohlone diet. Careful management of the land through controlled burning served to insure a plentiful and reliable source of all these foods (Levy 1978).

The Ohlone usually cremated a corpse immediately upon death, but the body was interred if there were no relatives to gather wood for the funeral pyre. Mortuary goods comprised most of the personal belongings of the deceased (Levy 1978).

The arrival of the Spanish in the San Francisco Bay Area led to a rapid and major reduction in native California populations. Diseases, declining birth rates, and the effects of the mission system served to largely eradicate their traditional lifeways (which are currently experiencing resurgence among Ohlone descendants). Brought into the missions, the surviving Ohlone, along with former neighboring groups of Esselen, Yokuts, and Miwok, were transformed from hunters and gatherers into agricultural laborers (Levy 1978; Shoup et al. 1995). With the

secularization of the mission system by an independent Mexico in the 1830s, numerous ranchos were established. Generally, the few Indians who remained were then forced, by necessity, to work on the ranchos.

Today, descendants of the Ohlone live throughout the Bay Area. Several Ohlone groups (e.g., Muwekma, Amah Mutsun) have banded together to seek federal recognition. Many Ohlone, both as individuals and as groups, are active in preserving and reviving elements of their traditional culture, such as dance, basketry, and song, and are active participants in the monitoring and excavation of archaeological sites.

3.5 HISTORICAL SETTING

Spanish exploration of Santa Clara Valley began in 1769 and led to the establishment of Mission Santa Clara de Asis in 1777 and Mission San Jose in 1797. Mission Santa Clara controlled much of the land of the Santa Clara Valley until the 1830s. Mission lands were used primarily for the cultivation of wheat, corn, peas, beans, hemp, flax, and linseed, and for grazing cattle, horses, sheep, pigs, goats, and mules. In addition, mission lands were used for growing garden vegetables and orchard trees such as peaches, apricots, apples, pears, and figs. The missions relied on the Native American population both as their source of Christian converts and their primary source of labor. Diseases introduced by the early expeditions and missionaries, and the contagions associated with the forced communal life at the missions, resulted in the death of many local peoples.

The Mexican government began the process of secularizing mission lands in the 1830s, but the process did not get underway at Mission Santa Clara until 1837. Large tracts of land, including former mission lands, were awarded to individuals during this time. In 1844, the Rancho Posolmi was granted by Governor Micheltorena to Lopez Iñigo (also Inigo or Ynigo), a Native American who lived near present-day Mountain View and farmed what would become ARC lands (AECOM 2017; Garaventa et al. 1991; NASA 2009). Iñigo is thought to have lived on-site until his death in 1864, and his interment is believed to be located within the boundaries of the nearby recorded archaeological resource CA-SCL-12/H. Rancho Pastoria de las Borregas was also situated in the vicinity (AECOM 2017). Jose Mariano Estrada petitioned for this grant for himself and his son. The rancho was ultimately granted to the son, Francisco M. Estrada, in 1842 by Governor Juan B. Alvarado. That same year, however, Jose Mariano Estrada sold the entire land grant to Mariano Castro, who in turn sold a portion of the rancho to Martin Murphy, Sr., in 1849.

With the signing of the Treaty of Guadalupe-Hidalgo on February 2, 1848, California formally became an American territory, and two years later, on September 9, 1850, California became the thirty-first state in the Union. In those two years (1848–1850) there was an influx of Americans seeking their fortunes, triggered by James Marshall's 1848 gold discovery at Sutter's Mill. The agricultural productivity of the Santa Clara Valley also attracted settlers, and during the 1850s there was significant growth (AECOM 2017). Many ranchos were divided and sold. Rancho Posolmi was subdivided: one part belonging to Iñigo's descendants; one part was given to Robert Walkinshaw; and the remaining part was given to Thomas Campbell (AECOM 2017).

Circa 1860, German immigrant John G. Jagels built a dock, warehouses, and other structures along the slough at the north end of the ARC properties (AECOM 2017). These shipping operations appear to have continued well into the twentieth century. In 1920, the South Shore

Port Co. dredged a slough at the old Jagels' Landing out to the bay to create a deep-water port. Ferry and freight service to San Francisco began in 1923. However, competition from other ferry service ports along the South Bay and the increasing use of the automobile resulted in company bankruptcy in 1927.

With the completion of the Transcontinental Railroad in 1869, San Jose, Santa Clara, and Milpitas were connected to a global marketplace, which opened new agricultural and manufacturing opportunities for the Santa Clara Valley (AECOM 2017). In the 1870s and 1880s, farmers diversified by moving into dairy, wool, poultry, meat, hay, grapes, and fruit tree production to protect themselves during bad crop years. And agriculture remained the primary economic engine in the area until the 1930s.

In 1931, the U.S. Navy established an airfield that became Moffett Field. The Navy ran operations there throughout most of its history (AECOM 2017). In 1991, the Base Realignment and Closure Commission recommended the closure of the naval air station, and on July 1, 1994, Moffett Field was closed to military operations, renamed Moffett Federal Airfield, and transferred to NASA. The Ames Aeronautical Laboratory was established on the airfield in 1939 by NASA's predecessor (AECOM 2017). Initial development of the Ames campus focused on the construction of massive wind tunnel facilities to test models and full-scale airplanes. In the 1950s, the Ames campus added new facilities to support research on both fundamental theoretical aerodynamics and specific industry concerns, most notably in sweptback wing design. Research at Ames tested vehicles at supersonic speeds, again supporting theoretical progress with applied experimentation, and laid the groundwork for developing flight simulators and computer-based modeling. Beginning in the 1960s, NASA Headquarters restructured the organization of its field centers including ARC to address space-related demands. ARC contributed to the successful development of viable spacecraft for all of NASA's space programs, including Mercury, Gemini, Apollo, and the Space Shuttle programs. After Moffett Federal Airfield was transferred to NASA in 1994, ARC became a larger and more diverse research campus. The APE is located along the eastern boundary of ARC.

3.6 PREVIOUS INVESTIGATIONS

3.6.1 Previous Studies

A records search for the ARC property was conducted by AECOM (2017) at the Northwest Information Center (NWIC), which identified 27 previous archaeological investigations conducted between 1970 and 2015 that overlap with, or are immediately adjacent to, the ARC property. These studies cover approximately 944 of the 1845 acres within the ARC boundary, or 51.17 percent and include: 11 subsurface testing programs, 10 pedestrian surveys, one archival review, one archival review with a windshield survey, one management plan, one determination of effects investigation, one data recovery program, and one testing and monitoring program. For details see AECOM 2017.

Approximately 49.2 percent (907.56 of 1845 acres) of the ARC property has been surveyed for archaeological resources, and none of the investigations resulted in the identification of previously recorded sites or any new sites. Also, 6.6 percent (121.88 of 1845 acres) of the property has been subject to subsurface testing or data recovery work. Six of these investigations were positive for archaeological material, although only three contained intact deposits (S-018367, S-035660, and Albion Environmental's Berry Court Extended Phase I

Study). The intact deposits reported in S-018367 and S-035660 are associated with site CA-SCL-12/H at the southeast end of the ARC boundary, and Albion Environmental's study is associated with CA-SCL-864/H located adjacent to ARC's southwestern boundary. Very recent excavations at site CA-SCL-19 by PaleoWest have recovered midden deposits, artifacts and nine human burials (personal comm. Thomas Young, PaleoWest Archaeology, July 18, 2019); the report for this site is in progress.

One study (S-016658) crossed the APE. This was a linear study adjacent to the east edge of the current ARC property (AECOM 2017). It consisted of archaeological testing and monitoring along 3 miles of pipeline alignment. Three isolated artifacts and fragments of human bone were found during the investigation, near the southeast corner of the ARC and a considerable distance from the current APE. The human remains were not in situ and are thought to have come from CA-SCL-12/H, which is located over 2,000 feet to the south of the APE. The pipeline project caused no adverse effect.

3.6.2 Previously Recorded Archaeological Resources

The records search results indicated that 11 archaeological resources (Appendix A) have been previously recorded within or immediately adjacent to the ARC property (AECOM 2017). All these sites were first inventoried by Nels Nelson in 1907–1908 during his survey of shellmounds along the margins of the San Francisco Bay. It was not until 1912, however, that these sites were recorded and mapped in greater detail by archaeologist Llewellyn Loud. Nelson's sites 346, 348 through 355, 357 and 358 are now CA-SCL-12/H, 14 through 21, 23 and 24, respectively. No new archaeological resources have been recorded on the ARC property since 1912. However, CA-SCL-864/H was discovered just outside the southwest corner of the ARC property in 2006. None of these archaeological sites are within or adjacent to the APE. The nearest previously recorded archaeological resources are approximately 1,000 feet from the current APE (Appendix A).

CA-SCL-14, -15, -16, -17, -18, and -19

Sites CA-SCL-14, -15, -16, -17, -18, and -19 were originally recorded in 1909 by N. Nelson during his survey of Bay Area shellmounds. In 1912, CA-SCL-14, -15, -16, -17, and CA-SCL-19 were recorded by L. Loud as prehistoric occupation sites. Loud recorded CA-SCL-18 as one of the Ynigo (Iñigo) campsites and noted that the site was destroyed at the time of recordation. All six resources are listed in the Santa Clara County Heritage Resource Inventory under Moffett Field Indian Mound. The 1991 survey of Moffett Field conducted by Basin Research Associates, failed to relocate any surficial evidence of the sites (S-013461) (Garaventa and Anastasio 1991). As such, Basin Research Associates concluded that, due to development of the area, the sites were likely destroyed and therefore lacked the integrity to be eligible for the NRHP. However, excavations completed in June 2019 at CA-SCL-19 have resulted in discovery of shell midden sediments, artifacts and nine burials (personal comm. Thomas Young, PaleoWest Archaeology, July 18, 2019).

CA-SCL-20/H

Site CA-SCL-20/H also was originally identified by Nelson in 1909 and recorded in 1912 by Loud as a very large occupation site and earth mound, "Loud's Big Ynigo Mound." Loud described it as 6/10-mile-long varying from 2 to 5 feet deep and surrounded by campsite

deposits. He noted one burial, a pestle and hammerstone, but also remarked that the site was nearly destroyed (Kelly 1989). Surface evidence of the site could not be relocated by Caltrans in 1987 (S-009440) (Kelly 1987a) nor by Basin Research Associates in 1991 (S-013461) (Garaventa and Anastasio 1991). Similarly, several testing efforts failed to find subsurface deposits related to site CA-SCL20/H. All of these testing efforts were limited to the southern extreme of the recorded site boundary, and include: a series of augers excavated to a depth of one meter and placed adjacent to northbound US 101 within the Caltrans right-of-way in 1987 (S-011047) (Kelly 1987b); 14 backhoe trenches dug between Manila Road and Macon Road in 1991 (S-014070) (Baker 1991); and three trenches dug adjacent to southbound US 101 within the Caltrans right-of-way in 2014 (S-045670) (URS 2014).

CA-SCL-23

Site CA-SCL-23, also designated as the Crittenden Mound, was originally identified in 1909 by Nelson. In 1912, Loud recorded the site as a kitchen midden/occupation site (Loud 1912). The Crittenden Mound was observed as late as the 1950s, showing up as a “kitchen midden,” or “Ka” on the U.S. Department of Agriculture, Soil Conservation Services soil map in 1958 for Santa Clara County (Figure 9); however, as noted above, by 1976 core sample analysis conducted near the intersection of De France Avenue and Arnold Avenue could not pinpoint its location, and Rappaport and Meredith concluded that the mound had likely been leveled and dispersed (S015230) (Rappaport and Meredith 1970). The 1981 surface survey of ARC conducted by David Chavez & Associates also determined that site CA-SCL-23 had been destroyed by years of agriculture (S-008447) (David Chavez & Associates 1981). Similarly, in 1993, Basin Research Associates conducted surface surveys and backhoe testing programs near the Parsons Avenue right-of-way (S-015758) (Garaventa and Guedon 1993a) and within 40 to 60 acres north of Allen Road (S-016393) (Garaventa and Guedon 1993b) in search of the Crittenden Mound. Both efforts failed to relocate the site. Based on these investigations, NASA determined site CA-SCL-23 to be ineligible for the NRHP (Kovar 1995) and received SHPO concurrence in 1995

CA-SCL-12/H

CA-SCL-12/H was first recorded as a midden deposit by Llewellyn L. Loud in 1912, although it may have been recorded earlier on Nelson’s map of shellmounds from 1909. Loud recorded that he observed skeletal fragments and abalone shell on the surface of the mound and the site was known as the Smaller Inigo Mound. Archaeological work at SCL-12/H has been extensive, although the most concentrated effort took place between May 2006 and February 2008, when William Self Associates (WSA) carried out archaeological testing, data recovery, and archaeological monitoring (Arrigoni et al. 2008). Intact basal deposits associated with CA-SCL-12/H (P-43-000032), representing the northern extent of the archaeological site, were encountered. Native American burials (n=37) and prehistoric pit features, unique to the San Francisco Bay area, were recovered. These represented occupation and burial at the site from 800 B.C. to 980 A.D. In 2008, Far Western conducted additional fieldwork within the Caltrans right-of-way at CASCL-12/H (Byrd and Berg 2009). The excavations yielded a total of 2,490 artifacts, large quantities of shellfish, vertebrates, and carbonized plant remains. They also identified an earlier component of the site. The result of the work by Far Western was the establishment of a well-defined boundary for all the intact midden areas.

CA-SCL-21 and -24

CA-SCL-21 and 24 were recorded as small occupation sites containing habitation debris by L.L. Loud in 1912 based on locations noted on Nels Nelson's map. Their dimensions and exact locations have not been confirmed through subsequent field studies. The 1981 surface survey of ARC conducted by David Chavez & Associates also determined that sites had been destroyed by years of agriculture (David Chavez & Associates 1981).

CA-SCL-864/H

CA-SCL-864/H is a shell midden site discovered during utility trenching in 2006. The site is known to have human remains and has a well-defined western boundary but has less well-defined boundaries elsewhere. Given its proximity, the site may be associated with nearby CA-SCL-21 and -24.

3.7 NATIVE AMERICAN COORESPONDENCE

PaleoWest contacted the Native American Heritage Commission (NAHC) on May 8, 2019, to request a review of the Sacred Lands File (SLF), and to determine if the NAHC had any knowledge of Native American cultural resources (e.g., traditional use or gathering area, place of religious or sacred activity, etc.) within the APE. The NAHC responded with a letter dated May 14, 2019, stating that the SLF search resulted in a negative finding. However, the NAHC suggested that PaleoWest contact six Native American tribal groups to solicit information regarding knowledge of any Native American resources related to the APE. All six tribal groups were contacted by email on May 24, 2019.

As of June 11, only one response has been received. Mr. Andrew Galvin, of the Ohlone Indian Tribe, responded via email on May 24. He mentioned the presence of archaeological site CA-SCL-12/H to the south of the APE, which he has been involved with over the past 30 years either as the appointed Most Likely Descendent (MLD) or Native American monitor because of the discoveries of human remains there. He also asked for a copy of any report to the Property Owner that includes archaeological recommendations. PaleoWest conducted follow up phone calls on June 3, 2019 to the remaining individuals that had not yet responded. No additional responses were received as a result of this follow up outreach attempt. The NAHC response to the SLF search request letter, the list of contacts, a sample letter to contacts, and a contact/response matrix are included in Appendix B.

3.8 ARCHAEOLOGICAL SENSITIVITY OF THE APE

3.8.1 Historic-Era Archaeological Sensitivity

AECOM (2017) developed their historic-era archaeological sensitivity of the ARC based on two distinct periods: the period prior to 1931, characterized by rural agricultural activities, and the period after 1931, when the Navy took ownership of the property, characterized by military and research development activities. Given the strict record keeping and waste management protocols of the post-1931 period—as well as the fact that many of the buildings associated with this period are still extant—the potential for encountering significant archaeological resources associated with the military period is generally considered low.

Prior to 1931, the area was dominated by small farms, as well as a small shipping and passenger ferry port at the north end of ARC along the bay shore. Although all above-ground evidence of these early American and Spanish period resources has been removed or obscured

through grading and site development in the latter half of the twentieth century, there is still the potential for buried archaeological resources in the form of artifact-filled depressions (e.g., wells, privies, cellars, etc.) and subsurface structural elements (i.e., foundations).

All the areas of pre-1931 historic-era development, except for the Jagel's Landing area at the north end of the airfield, are considered to have sensitivity for potentially significant historic-era archaeological resources. Because of the variable accuracy of the historic-era maps, and the inherent inaccuracy of georeferencing such maps, a 250-foot buffer was applied around each of the homestead/structure areas depicted on historic maps. Unfortunately, given the long history of cutting and filling for military development across ARC, it is not possible to anticipate how deeply buried such resources may be, if they are present at all. On average, it must be assumed that there is a moderate potential for encountering buried historic-era archaeological resources within these areas.

The APE is outside of all the mapped areas of pre-1931 historic-era development and is, therefore, in an area of low historic-era archaeological sensitivity (see Figure 16 in AECOM 2017).

3.8.2 Prehistoric Archaeological Sensitivity

Prehistoric archaeological sensitivity is also based on known prehistoric sites located at or near the surface during the historic period (AECOM 2017). Prehistoric sites CA-SCL-14 through SCL-20 and SCL-23, all the previously recorded surface prehistoric sites within ARC, have been investigated numerous times, and except for CA-SCL-19 (see below), with no evidence of their continued existence. In addition to the previously recorded resources within the ARC boundary, at least four prehistoric archaeological sites have been documented adjacent to the ARC. These include CA-SCL-13, CA-SCL-14, CA-SCL-15 and CA-SCL-25, located outside of the ARC boundary.

The entire area in and around the ARC property may be considered sensitive for prehistoric archaeological deposits given the number of previously recorded sites. However, the APE is very small and lies well outside of all these previously recorded prehistoric archaeological site locations. Given the level of archaeological investigation of the ARC property prior to the development of the naval airbase it does not seem likely that prehistoric deposits will be discovered within the APE. The APE itself remains in an area of low archaeological sensitivity within the broader region (AECOM 2017, Figure 16).

4.0 FIELD INVESTIGATION

4.1 FIELD METHODS

In accordance with NHPA Section 106 (36CFR800.4 (b)(1)), and as a means of identifying any previously unknown historic properties, PaleoWest conducted an archaeological pedestrian survey of the APE. This work was conducted under the supervision of a PaleoWest archaeologist meeting federal criteria under 36 CFR 61.

An intensive pedestrian survey of the project area was conducted by PaleoWest archaeologist, Ashley Schmutzler, on April 4, 2019. The survey was conducted by walking parallel transects across the entirety of the APE where the ground was exposed. A portion of the APE is covered by asphalt and road surface and was not surveyed. Transects were spaced less than 10-meter (33-foot) intervals. The APE was recorded with digital photographs for use in the report. Photographs included general views of the topography and vegetation density, and other relevant images. A photo log was maintained to include, at a minimum, photo number, date, orientation, photo description, and comments. The surveyor carefully inspected all areas of ground visibility in the project area to ensure discovery and documentation of any archaeological resources that might be visible within the project area.

The surveyor looked for historical and prehistoric site indicators. In such a limited survey area, the only historical site indicators anticipated were concentrations of materials at least 45 years in age, such as domestic refuse (e.g., glass bottles, ceramics, toys, buttons or leather shoes), refuse from other pursuits such as agriculture (e.g., farm machinery parts, horse shoes) or structural materials (e.g., nails, glass window panes, wood posts or planks, metal pipes and fittings, etc.). Anticipated prehistoric site indicators include areas of darker soil with concentrations of ash, charcoal, animal bone (burned or unburned), shell, flaked stone, ground stone, pottery, or even human bone.

4.2 FIELD RESULTS

The APE is relatively flat and densely covered with low lying grasses and weeds (Figures 5-1, 5-2). In addition, part of the APE is covered with roadway asphalt. Sediments within the APE are a crumbly, slightly compacted silty clay (Munsell 10YR 3/2). Some small gravels are present. A cyclone fence crosses the APE. Due to the density of the low-lying vegetation and thick short grasses, ground visibility in the unpaved portion of the APE is fair to moderate (20-50%). Where visibility was most obstructed by high vegetation, "boot scrapes" were used to expose the ground surface.

No evidence of either prehistoric or historic-era archaeological deposits were encountered during the survey effort supporting the understanding that the APE is outside of any area of archaeological sensitivity.



Figure 4-1 Overview of the APE, view to the north



Figure 4-2 Overview of the APE, view to the east. Intersection of 5th Avenue and Enterprise.

5.0 MANAGEMENT RECOMMENDATIONS

This cultural resources investigation revealed that no prehistoric and no historic-era archaeological deposits are present in the APE. While the area that includes the ARC property and surrounding areas are generally considered sensitive for prehistoric archaeological deposits the APE is well outside of all these previously recorded prehistoric archaeological site locations. Given the level of archaeological investigation of the ARC property prior to the development of the naval airbase, it seems unlikely that prehistoric deposits would be present within the APE. The APE itself remains an area of low prehistoric archaeological sensitivity within the broader region. The closest area of heightened prehistoric archaeological sensitivity lies approximately 1,000 feet to the west of the APE. Although numerous burials were recovered from this site, the site's boundaries have been well demarcated showing that its midden deposits do not extend any farther north (Byrd and Berg 2009). The closest area of heightened historic-era archaeological sensitivity lies approximately 1,000 feet to the south and to the west. Furthermore, no archaeological resources were encountered during the installation of the existing 8-inch recycled water line in 2017, directly adjacent to the APE. Therefore, a finding of "No Historic Properties Affected" pursuant to 36 CFR Part 800.4(d)(1) is recommended for the proposed undertaking as the identification efforts discussed above identified no archaeological resources/historic properties in or within close proximity to the APE.

PaleoWest recommends that if unanticipated archaeological materials are encountered during ground-disturbing activities in the APE, all work should be halted in the vicinity of the archaeological discovery until a qualified archaeologist can visit the site of discovery and assess the importance of the archaeological resource. Inadvertent discovery procedures, outlined in Standard Operating Procedure (SOP) Number 8 of the NASA Ames Research Center's 2014 Integrated Cultural Resources Management Plan (ICRMP), should be followed in the event that unknown archaeological materials are uncovered during construction. Per SOP 8, all work will be stopped, and the Cultural Resources Manager will be notified, after which a professional archaeologist will be consulted to evaluate the potential resource and determine appropriate actions. In addition, Health and Safety Code 7050.5 and Public Resources Code 5097.98 mandate the process to be followed in the unlikely event of an accidental discovery of any human remains in the APE. Finally, should additional project activities be proposed outside the currently defined APE that has the potential for additional subsurface disturbance, further actions may be required to maintain compliance with Section 106, including renewed consultation with SHPO.

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The following appendices were redacted from this public posting:

Appendix A: Recorded Archaeological Sites within Project Vicinity

Appendix B: Native American Coordination