

USGS FEMA SOUTH SITE COMMUNICATIONS FACILITY
SECTION 106 TECHNICAL REPORT

SANTA CLARA COUNTY, CA
[19319]

PREPARED FOR:
USGS



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I. INTRODUCTION

The U.S. Geological Survey (USGS) proposes to install a communications facility at the National Aeronautics and Space Administration (NASA) Ames Research Center (ARC) at Moffett Federal Airfield (MFA) to facilitate continued functionality of the USGS's digital microwave network that monitors seismic activity in Northern California. The proposed communications tower will also accommodate installation of short range radar equipment for use with unmanned aerial systems projects. As the lead federal agency, NASA is responsible for compliance with the National Historic Preservation Act of 1966, as amended through 2016, including Section 106, 36 Code of Federal Regulations (CFR) Section 800, which requires federal agencies to take into account the effects of their activities and programs on historic properties.

NOMENCLATURE

For clarity, the proposed USGS FEMA South Site communications facility installation project will be referred to as “the Undertaking.”

PURPOSE

The purpose of this document is to provide necessary information for Section 106 consultation regarding historic properties identified in the Area of Potential Effects (APE), pursuant to 36 CFR Section 800.5(a).

This document should be reviewed in conjunction with the Undertaking plans and documentation that have been provided as part of this Section 106 consultation submittal (see appendices).

METHODOLOGY

This report provides a description of the Undertaking; a description of the APE; a brief historic context of MFA and the NASA ARC campus, identification of historic properties within the APE; and conclusion with findings. Appendices A through C include maps of the proposed Undertaking (location and APE); the Undertaking site plan prepared by GDS, Inc. for USGS, dated September 8, 2019; and field photographs of the Undertaking location and APE.

Page & Turnbull prepared this report using information included in previous documentation regarding archaeological and historic-period properties at NASA ARC and MFA, aerial photographs in the collection of the UC Santa Barbara Library, and USGS topographic quadrangles. Information on the Undertaking was provided to Page & Turnbull by GDS, Inc.

At the request of Page & Turnbull, on November 12, 2019 staff of the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) conducted a records search for the Undertaking area (NWIC File No. 19-0697). The search included all previously recorded cultural resources and studies mapped within one half mile of the Undertaking. Page & Turnbull also reviewed the Office of Historic Preservation (OHP) Directory of Properties in the Historic Property Data File for Santa Clara County as of 2012.

On November 1, 2019, Page & Turnbull staff meeting the Secretary of the Interior's Professional Qualifications Standards in Archaeology per 36 CFR Part 61 conducted a site visit and a pedestrian reconnaissance field survey of the Undertaking location. All photographs in this report were taken by Page & Turnbull on November 1, 2019, unless otherwise noted.

SUMMARY OF FINDINGS

Three historic properties and four age-eligible properties identified within the APE consist of buildings and structures constructed between 1944 and 1970, associated with the aeronautical and scientific focus of NASA ARC. Page & Turnbull's analysis finds that the proposed Undertaking would not alter, directly or indirectly, any of the characteristics that qualify a historic property for inclusion in the National Register of Historic Places (National Register). The result of the current identification and evaluation for the proposed Undertaking is a finding of "No Adverse Effect," pursuant to 36 CFR Part 800.4(d)(2) and 800.11(e)(3).

II. THE UNDERTAKING

LOCATION AND DESCRIPTION

The site of the proposed Undertaking is located at NASA ARC between the municipalities of Mountain View and Sunnyvale, California, on the southwest edge of the San Francisco Bay. The site of the Undertaking is approximately 27 miles southeast of San Francisco International Airport, and six miles northwest of San Jose International Airport. The proposed Undertaking location, Lot 127C, is on the north side of Pollack Road, and is currently occupied by asphalt and gravel parking areas and a maintenance facility building shed constructed in 1999 (See location map, **Appendix A, Figures A-1 and A-2**).

The proposed Undertaking involves placement of a permanent communications facility consisting of a 70-foot, four-legged self-supporting tower and a 12-foot by 26-foot prefabricated communications shelter within a fenced 3,600 square foot (60 feet by 60 feet) area in Lot 127C. The 70-foot tower will have instrumentation attached on the sides between approximately 50 and 70 feet above the ground surface with space for additional equipment down to 25 feet above ground surface. A Lightweight Surveillance Target Acquisition Radar (LSTAR) antenna, lightning rod, and tower beacon strobe light will be placed at the top of the tower. With all instrumentation attached, the total height of the structure will be 80 feet. The communication shelter, to be set on elevated piers to provide survivability from catastrophic floods, will house radio and seismic sensor equipment and an interior emergency backup generator with a propane tank.. The facility will use commercial power brought underground from an existing manhole within the existing paved compound labeled MH 122 (approximately 75 feet north). Fiber optic cabling will be installed from the existing MH122 manhole to provide connectivity from the tower facility to USGS offices located at NASA ARC. The Undertaking will include above-grade work as well as ground disturbance for installation of the communications tower. Drawings providing details of the proposed undertaking, prepared by GDS, Inc. in September 2019, are included in **Appendix B**.

Construction of the communications facility will require the following activities:

- Removal of current asphalt paving in the tower area;
- Excavation of tower and platform foundations using a backhoe or excavator and caisson drilling rig and installation of concrete piers (Four 2-foot-wide by 22-foot-deep drilled columns each for the tower and platform);
- Assembly of the tower and shelter platform;
- Installation of the shelter and generator;
- Installation of ice bridge between shelter and tower (post foundation excavations to 3 feet below ground surface);
- Installation of fuel tank on slab on ground surface, with tie-down straps (excavation for slab foundation and base fill to approximately 1 foot below ground surface);
- Installation of buried fuel line from tank to platform leg;

- Installation of seven- and eight-foot high chain-link and barbed wire fence and gates around perimeter of 60-foot by 60-foot facility area (post foundation excavations to 3 feet below ground surface);
- Installation of the grounding system in shallow trenches, up to three-and-a-half-feet deep, surrounding the shelter, tower, and fuel tank, tied to existing adjacent fencing;
- Excavation of a three-and-a-half-foot deep joint utility trench to connect the facility to electrical and fiberoptic systems through the existing pull box; and
- Installation of two new pull boxes to facilitate installation of additional, new electric and fiberoptic cables;
- Installation of utility H-frame and bollards near northeast corner of facility area (post/footing foundation excavations to four and a half and three feet below ground surface);
- Installation of access road/apron to new access gate.

All construction staging will occur within Lot 127C, and construction will last approximately two months.

AREA OF POTENTIAL EFFECTS

An Area of Potential Effects (APE) is a defined geographic boundary in which historic properties may be affected by an undertaking, including direct effects (such as demolition) and indirect effects (such as blocking a visual corridor) that impact the historic character of a property.¹ An undertaking would have an effect on a historic property if the action would result in changes to the character of any of the historic properties within the APE. An APE may include historic properties that are well beyond the limits of the undertaking.

The following analysis for the current Undertaking involves an APE that represents those areas in which the scope of the Undertaking could potentially affect historic properties. The APE encompasses the Area of Direct Impact (ADI), meaning the project site and footprint where direct effects to above and below ground historic properties could occur. The ADI for the proposed undertaking is limited to the 60-foot by 60-foot portion of Lot 127C within which installation will occur. The proposed vertical impacts vary within the ADI between surface grading across most of the ADI and drilling to approximately 22 feet below ground surface (BGS) at eight locations for tower and platform foundations.

The APE also includes the areas within which the integrity of historic properties' setting, if and where historic properties exist, could be affected indirectly through visual, atmospheric, or audible changes. For the current Undertaking, the APE boundary is defined by a radius of 1,000 feet from the center of the ADI. The limited scale of the Undertaking is not likely to result in any indirect effects beyond this distance.

A map illustrating the location of the APE and ADI is included in **Appendix A, Figure A-3**.

¹ Seifert, Donna, *Defining Boundaries for National Register Properties Bulletin*, revised 1997: accessed <http://www.nps.gov/NR/publications/bulletins/boundaries/bound1.htm>

III. HISTORIC CONTEXT

PRE-EUROPEAN HISTORY

Archaeological sites near the margins of San Francisco Bay have yielded information that pre-contact residents occupied the area for several millennia, with most sites and deposits found dating to the Middle Archaic Period (5000 – 2500 Before Present [B.P.]) and later.² At the time of European contact, the area was occupied by Ohlone peoples, whose traditional territory extended across the San Francisco Bay and Monterey Bay regions. Members of the Ramaytush and Tamyen groups resided where ARC is now located.

EARLY EUROPEAN SETTLEMENT

European settlement of the Santa Clara Valley was anchored by the Mission Santa Clara de Asis and Pueblo of San Jose de Guadalupe, established in 1777 near the Guadalupe River in what are now the cities of Santa Clara and San Jose to the southeast of the Undertaking area. With secularization of the missions in the early years of Mexican control of California, individual land grants divided former mission land holdings into large, privately held agricultural parcels. The Undertaking location was within the Rancho Posolmi, granted in 1844 to Lopez Ynigo, an Ohlone man who had served as Alcade at the Mission Santa Clara. In the years following Ynigo's death in 1864, Rancho Posolmi was subdivided into six smaller parcels sold to different land owners. These remained largely in agricultural use until the establishment of Naval Air Station (NAS) Sunnyvale.

MOFFETT FEDERAL AIRFIELD

The installation now known as Moffett Federal Airfield was originally established as Naval Air Station (NAS) Sunnyvale, the West Coast base for the U.S. Navy's burgeoning Lighter-Than-Air aviation programs of the 1930s. By the time the air station was commissioned in 1933, the U.S. Naval Bureau of Yards and Docks had constructed Hangar 1, a campus of administrative and residential buildings for military personnel that were related to one another through their Spanish Colonial Revival architectural style, and a small airfield consisting of a landing strip and small diagonal runways in the area east of Hangar 1. The original campus had a formal plan and an axial orientation with Hangar 1; a symmetrical horseshoe-shaped roadway with a large central plaza was flanked by a number of the support buildings. A small community of residences for base staff was constructed around a cul-de-sac southwest of the main campus. The site was transferred to the U.S. Army Air Corps in 1935.

The U.S. Navy regained control of the installation during World War II and reintroduced Lighter-Than-Air missions at the installation, by this time known as Moffett Field. Wishing to expand, the Navy acquired over 200 acres of land east of the existing airfield. Hangars 2 and 3 were built in this location between 1942 and 1943. Following the end of the war, the airfield transitioned to support training and testing missions associated with Heavier-Than-Air craft, including supersonic jets. During the late 1940s and 1950s, the Navy expanded the airfield runways and taxiways to meet the take-off and landing requirements of these enhanced aircraft. Additional buildings and airfield features—including explosive storage magazines, fueling pits, and a flight operations building—were introduced in support of these missions.

In 1994, Moffett Field was decommissioned from military use through the Base Realignment and Closure process, after which NASA assumed responsibility for the installation and it was integrated with NASA ARC.

² Detailed archaeological and early historical context for the Undertaking area is available in AECOM, NASA Ames Research Center Archaeological Resources Study (San Francisco: Prepared for NASA, 2017).

NASA AMES RESEARCH CENTER

Established in 1939, the Ames Aeronautical Laboratory was a field center operated by the National Advisory Committee for Aeronautics (NACA) and dedicated to researching and developing technology for military aircraft production leading up to World War II. Initially, the Ames NACA field center was a small collection of buildings and wind tunnels and original wind tunnels, located immediately west of NAS Sunnyvale—later named Moffett Field—and surrounded by agricultural land. These first buildings were sited in an aesthetically driven fashion with axial boulevards and the prominent placement of the administration building (N-200) within a large traffic circle. However, as competition for improved aircraft technology mounted during the course of the war, progressively advanced facilities were constructed, and the site landscape became increasingly utilitarian. The expansion of advanced facilities continued into the immediate postwar years, as American scientists and manufacturing companies sought to explore jet propulsion and rocket technologies. At the end of the war, there were two wind tunnels at Ames, but a decade later that number had tripled to include several wind tunnels, including the 6x6 Ft. Wind Tunnel (N-226) and Unitary Plan Wind Tunnel Building Complex (N-227, N-227A, N-227B, N-227C, N-227D).

In 1958, the NACA and all of its facilities were integrated into the newly formed National Aeronautics and Space Administration (NASA). Under this new agency, the newly named Ames Research Center was partially rededicated with an expanded mission to include space exploration. Since 1958, with research delving into new and complicated areas, the need for innovative facilities at NASA ARC has been a constant. While the original parts of the ARC campus had evident notes of City Beautiful planning, the expanded areas were typically plotted on a simple grid system, except for the eastern portions, which are angled to correspond with the orientation of the runways at Moffett Federal Airfield (MFA). Development typically radiated north and west from the original 1940s campus and included new facilities focused on aeronautical and aerospace research. Insular areas of the ARC campus were infilled during the late 1970s and 1980s to accommodate the growth of the installation. The trend of infill development continued through the 1990s and 2000s, with the most recent building, the NASA Ames Sustainability Base (Building N-232), being constructed in 2015 within the original NASA ARC area. The existing campus includes dozens of buildings of all shapes and sizes built from the 1940s to the present.

IV. IDENTIFICATION OF HISTORIC PROPERTIES WITHIN THE APE

Historic properties, as defined in 36 CFR Section 800.16(l)(1), include any district, site, building, structure, or object that is included in or eligible for listing in the National Register.

PREVIOUSLY RECORDED HISTORIC PROPERTIES

Archaeological Properties

Several archaeological properties have been studied throughout MFA and the neighboring areas. Some of these investigations occurred over 100 years ago, while others were the subject of recent investigations as part of due diligence exercises for ongoing development of the airfield. In February 2017, the *NASA Ames Research Center Archaeological Resources Study*, prepared for NASA by AECOM, was published with the following intent:

In support of NASA's obligations under [the National Historic Preservation Act of 1966], this Archaeological Resource Study was prepared to identify the potential for archaeological resources at [NASA] ARC to inform and guide NASA's Management of archaeological cultural resources. This study also supports [NASA] ARC's Integrated Cultural Resources

Management Plan (ICRMP), which contains guidance for the treatment of both archaeological and built environment cultural resources.³

In preparing the Archaeological Resources Study, an extensive records search was conducted of previous surveys, recorded resources, historic maps, Sacred Land Files from the Native American Heritage Commission (NAHC), and hundreds of geotechnical investigations that occurred at NASA ARC. Using these sources, the Archaeological Resources Study presents a series of maps that use the cumulative source materials and the records search to illustrate areas that are organized into four categories of archaeological sensitivity.

- *Heightened Historic-era Archaeological Sensitivity*: locations where pre-1931 development occurred, namely structures associated with agricultural activities in the area.
- *Heightened Prehistoric-era Archaeological Sensitivity*: locations where archaeological materials that reflect earlier periods of human occupation and activity, spanning an approximate 13,500 years.
- *Heightened Geoarchaeological Sensitivity*: locations where materials related to older periods of human activity that were subject to geological processes over thousands of years.
- *Low Archaeological Sensitivity*: areas within NASA ARC that were not designated within the aforementioned categories and were determined to have a low potential for containing archaeological resources.

These materials presented in the Archaeological Resources Study was reviewed and approved by the California Office of Historic Preservation (OHP) in June 2017. According to the archaeological sensitivity maps included within the 2017 Archaeological Resources Study, the Undertaking's ADI is located exclusively in an area that has been determined to have low archaeological sensitivity. There is an area of Heightened Historic-era Archaeological Sensitivity near the southeast boundary of the APE, where there is no Undertaking-related ground disturbance proposed.

In addition to reviewing the 2017 AECOM *NASA Ames Research Center Archaeological Resources Study*, Page & Turnbull requested that staff of the Northwest Information Center (NWIC) of the California Historical Resource Information System (CHRIS) conduct a records search for previously recorded historic resources within a half-mile radius of the ADI (NWIC File No.: 19-0697). No previously recorded archaeological resources were identified within the APE. One previously recorded archaeological site, CA-SCL-23 (P-43-000043), is located approximately one half mile to the northwest of the proposed Undertaking location, outside the APE. Testing conducted in 1970, 1981, and 1993 did not identify deposits associated with the site, and NASA determined in 1995, with SHPO concurrence, that CA-SCL-23 (P-43-000043) is ineligible for listing in the National Register.⁴

Above-Ground Historic Properties

Above-ground historic properties located within NASA ARC and MFA, including historic-period buildings, structures, and objects, have previously been studied in efforts to inform an understanding of the historic significance of properties throughout the area. These studies were used to determine whether the construction of the Undertaking may have potential effects on historic properties within the APE. The previous studies consulted by Page & Turnbull include the following:

³ AECOM, *NASA Ames Research Center Archaeological Resources Study*, prepared for NASA Ames Research Center (2017), 1.

⁴ AECOM, *NASA Ames Research Center Archaeological Resources Study*, 38; California OHP Archaeological Determinations of Eligibility, Santa Clara County, April 5, 2012.

- *US Naval Air Station Sunnyvale, California Historic District National Register of Historic Places Nomination*, Bonnie Bamburg, Urban Programmers: 1994.
- *Evaluating Historic Resources Associated with the Space Shuttle Program: Criteria of Eligibility for Listing in the National Register of Historic Places*, Page & Turnbull: 2007.
- *Historic Property Survey Report for the Airfield at NASA Ames Research Center, Moffett Field, California*, AECOM: 2013.
- *NASA Section 106 Consultation: Arc Jet Complex Steam Vacuum System Boiler Replacement Project at Ames Research Center, Moffett Field, California*, NASA 2015.
- *Bay View Campus Section 106 Technical Report, NASA Ames Research Center, Moffett Field, California*, Page & Turnbull 2016.

As a result of these studies, an original and Expanded NAS Sunnyvale Historic District and a Wind Tunnel Historic District were identified. The ADI is located outside the boundaries of the historic districts. No individually listed or eligible historic properties are located within the ADI.

The eastern edge of the APE overlaps the western portion of the Expanded NAS Sunnyvale Historic District and district a contributor, the West Parallel Aircraft Taxiway (MF1016). The original NAS Sunnyvale Historic District was listed in the National Register in 1994. This discontinuous district includes the original portions of the NAS Sunnyvale installation campus, also known as Shenandoah Plaza, Hangar 1, as well as Hangar 2, Hangar 3, and a small portion of the adjacent aircraft apron. The Expanded NAS Sunnyvale Historic District was identified as the result of consultation between NASA and the California Office of Historic Preservation (OHP) in 2013. Through this consultation, the boundaries of the district were expanded to form a National Register-eligible extension whose boundaries encompass the airfield, its associated runways, and various support buildings and structures, including the World War II-era ammunitions facilities at the northeast corner of the property.⁵

The southwest portion of the APE contains two previously identified historic properties which are outside of the NAS Sunnyvale Historic District: the National Register-listed Arc Jet Laboratory (N238), and the National Register-eligible Systems Development Facility (N242) (**Figure C- 1**).

Historic properties within the APE are summarized in Table 1. More detailed information on these properties (including their historic use and the criteria under which they were evaluated) can be found in the documents identified in the previous studies listed above. Maps that show the locations of historic properties are included in **Appendix A**.

⁵ Consultation between NASA and OHP expanded the boundaries of the NAS Sunnyvale Historic District to encompass the installation's airfield and adjacent aviation-related buildings and landscape features. The Historic Property Survey Report (HPSR) completed by AECOM and dated November 26, 2013 considered resources associated with the airfield for contributing status under an expanded period of significance, 1930-1961, and a list of potential contributors was assembled. OHP has not formally concurred with this list of properties, but has found it appropriate to consider them as historic properties during subsequent Section 106 consultation.

Table 1: Historic Properties in the APE

Current Name/Historic Use (Building #)	Year Built	Status / Evaluation
West Parallel Aircraft Taxiway (MF1016)	c. 1946	<i>National Register Eligible</i> ⁶ Contributor to Expanded NAS Sunnyvale Historic District.
Mach 50 Helium Tunnel (Arc Jet Laboratory)(N238)	1964	<i>National Register Listed</i> . ⁷ Part of the Arc Jet Complex, listed in 2017, significant for its contribution to science and engineering development related to spaceflight programs at NASA ARC. Associated Buildings: Arc Jet Storage Facility (N238A), Arc Jet D.I. Water Pump Distribution Station (N238B), Arc Jet Battery House (N238C)
Structural Dynamics Laboratory (Systems Development Facility) (N242).	1965	<i>National Register Eligible</i> ⁸ The Systems Development Facility is significant for its role in missile and spacecraft testing, and as a distinctive example of a specialized building type.

PROPERTIES ELIGIBLE FOR EVALUATION

Archaeological Properties

Page & Turnbull conducted a pedestrian survey of the ADI on November 1, 2019. The surface of Lot 127C, a 350-foot by 360-foot fenced area within which the 60-foot square installation will be placed, was observed to consist of asphalt paving at the east 150 feet, and angular gravel fill across the west 200 feet. Surface scrapes within the gravel area exposed compressed fill. Exposed ground surface within the ditch between Lot 127 and Pollack Road and in the undeveloped area to the east of Lot 127 was inspected. No evidence of archaeological deposits was present in exposed soil areas and the numerous rodent burrow spoil piles. Therefore, no archaeological properties eligible for evaluation were identified in the ADI. Photographs taken during the pedestrian survey are provided in **Appendix C, Figure C- 2 through Figure C- 8**.

Above-Ground Historic Properties

Four properties 50 years of age or older, which have not been previously evaluated, are located within the APE. A map depicting the locations of these buildings is provided in **Appendix A, Figure A-3**. Photographs are provided in **Appendix C**.

- *Building N123* (Material/Equipment Storage, 1944) is a small, corrugated metal-clad Quonset hut built in 1944, located approximately 500 feet to the northwest of the ADI. Its long axis is aligned east-west, and the east and west facades each feature a single set of swinging two-leaf utility doors (building could not be accessed to photograph).
- *Building N 127* (Warehouse, 1950) consists of 6 conjoined, end-gabled warehouse segments set in a rectangular block approximately 200 feet southwest of the ADI. Each of the six

⁶ AECOM, Historic Property Survey Report for the Airfield at NASA Ames Research Center, Moffett Field, California (San Francisco: Prepared for NASA Ames Research Center, 2013).

⁷ NASA Ames Research Center Summary of Historic Properties. Available at https://historicproperties.arc.nasa.gov/downloads/summary_2017.pdf, accessed November 25, 2019.

⁸ NASA, NASA Section 106 Consultation: Arc Jet Complex Steam Vacuum System Boiler Replacement Project at Ames Research Center, Moffett Field, California, Submitted to California SHPO November 12, 2015, 14.

segments includes a two-leaf sliding utility door centered in its north and south facades, flanked by rectangular corrugated fiberglass “windows” set in metal frames. Rectangular louvered metal vents are set within the gable, above the utility door on some segments. The roof and facades are clad in standing-seam and corrugated sheet metal **(Figure C- 9)**

- Building N244 (Space Projects Facility, 1967) is a two-story concrete building with a flat roof and L-shaped footprint, constructed in 1967, and located approximately 900 feet to the southeast of the ADI. It is characterized by narrow bays with rectangular windows along the south, east, and north facades of the east wing. The west wing is unfenestrated, and features scored concrete with metal ground-level utility and pedestrian entrances on the north and west façades **(Figure C- 10)**
- Building N245 (Space Sciences Research Lab, 1970) is a two- and three-story concrete building with an L-shaped footprint, located approximately 175 feet to the southeast of the ADI, across Pollack Road. Completed in 1970, the building features a flat roof and narrow bays with paired rectangular windows alternating with vertically scored concrete sections along most facades. The south façade of the west wing is clad with corrugated metal sheeting **(Figure C- 11).**

As none of these four buildings will be directly impacted by the proposed Undertaking, an evaluation of their potential individual significance has not been completed here. The potential for the Undertaking to alter their setting to a degree that would impact future evaluations of individual eligibility for the National Register will be considered in the following section.

NON-HISTORIC PROPERTIES WITHIN THE APE

One building within the APE, the General Warehouse (N144), has been previously found ineligible for the National Register through Section 106 review process **(Figure C- 12).**⁹

An additional 14 buildings and structures within the ADI and APE, which are less than 50 years old and do not appear to possess exceptional significance, are considered to be non-historic for the purposes of this review. These include:

- N123A (Generator Storage, 1995)
- N127A (Covered Storage, 1998)
- N127B (Maintenance Equipment Storage Shed, 2000)
- N127C (Maintenance Facility, 1999)
- N238A (Arc Jet Storage Facility, 1991)
- N238B (Arc Jet Water Pump Distribution Station, 2005)
- N238C (Arc Jet Battery House, 2003)
- N250 (High Pressure Air Compressor Building, 1974)
- N250A (High Pressure Air Storage Facility, 1990)
- N250B (Storage Shed, 1995)
- NA291 (Recreation Area, 2004)
- T127D (Recycling Office Trailer, 2001)
- T20F (Modular Office Building, 1989)
- T20G (Modular Office Building, 1988)

⁹ NASA, Arc Jet Complex Steam Vacuum System Boiler Replacement Project, 10.

V. APPLICATION OF THE CRITERIA OF ADVERSE EFFECT

The criteria of adverse effect on historic properties under Section 106 of the NHPA are defined in 36 CFR Section 800.5(a)(1) as follows:

An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

According to 36 CFR Section 800.5(a)(2), examples of adverse effects on historic properties include, but are not limited to:

- i. Physical destruction of or damage to all or part of the property;
- ii. Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Section 68) and applicable guidelines;
- iii. Removal of the property from its historic location;
- iv. Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
- v. Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;
- vi. Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and
- vii. Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

To comply with Section 106, the criteria of adverse effect are applied to historic properties in the Undertaking's APE, pursuant to 36 CFR Section 800.5(a). A finding of no adverse effect may be appropriate when the undertaking's effects do not meet the threshold set forth in the criteria of adverse effect, or conditions are imposed to ensure review of rehabilitation plans for conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties (codified in 36 CFR Section 68). If a finding of adverse effect is made, mitigation is proposed and resolution of adverse effects occurs through consultation in accordance with 36 CFR Section 800.6(a) to avoid, minimize, or mitigate adverse effects on historic properties.

The proposed undertaking does not include physical alteration, rehabilitation, relocation, change of use, or transfer out of Federal ownership of any historic properties or previously unevaluated age-eligible properties within the APE. No physical treatments or other direct impacts are proposed for any historic property. As such, examples i, ii, iii, vi, and vii are not applicable to the Undertaking. The potential for adverse effects related to the Undertaking are indirect in nature, limited to changes in setting or introduction of visual, atmospheric, or audible elements.

FINDING OF EFFECT

Per the criteria of adverse effect pursuant to 36 CFR Section 800.5(a)(1) and examples provided in 36 CFR Section 800.5(a)(2), an analysis of the Undertaking reveals the following:

iv. Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance.

The proposed Undertaking has the potential for indirect effects to the setting of three historic properties within the APE: the West Parallel Aircraft Taxiway (MF1016), the Mach 50 Helium Tunnel (Arc Jet Laboratory)(N238), and the Structural Dynamics Laboratory (Systems Development Facility) (N242). Four age-eligible, previously unevaluated properties are located within the APE: Material/Equipment Storage (N123), Warehouse (N127), Space Projects Facility (N244), and Space Sciences Research Laboratory (N245).

The original and current setting of each of these buildings is that of a large establishment focused on aeronautics and scientific development, with highly specialized research facilities and support buildings surrounding each. As a scientific data collection installation, the introduction of the proposed USGS tower and supporting facilities will be consistent in use with the existing historic properties and age-eligible properties. The tower's proposed scale, at a maximum height of 80 feet with all installed features, would not create a disproportionate feature within this part of ARC. The undertaking would therefore not cause a change in setting that would affect the significance or potential significance of any historic properties or age-eligible properties within the APE.

v. Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features.

As described in the Identification of Historic Properties section of this report, the Undertaking's APE has been found to contain three historic properties and four age-eligible properties that could potentially experience indirect effects—such as the introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's historic features—as a result of the Undertaking.

Visual Effects:

The 2013 Historic Property Survey Report (HPSR) prepared by AECOM, which identified the boundaries and contributors to the Expanded NAS Sunnyvale Historic District, specified visual relationships that assisted in conveying significance of the airfield, of which MF1016 (West Parallel Taxiway) is a part. The HPSR identified the “expansive, open view from the south end of the runways looking north toward San Francisco Bay”¹⁰ as the primary significant view from the airfield towards its setting. Building upon this point, the HPSR specifically analyzed the historic district's setting and recognized that other areas surrounding the airfield have experienced new development since the end of the identified period of significance, 1961, but that this surrounding non-historic development does not impinge on the historic district's ability to convey its historic significance. In discussing the historic district's setting, the HPSR states,

Still, the visual relationships—most importantly to Hangar 1, but also to the bay and salt ponds to the east and north, and to Shenandoah Plaza and other features of the NAS Sunnyvale Historic District to the west—remain similar to their historic appearance before 1961, and continue to define the site's setting as they have since

¹⁰ AECOM, *Historic Property Survey Report*, page 4-3.

the 1930s. Therefore, integrity of setting is retained.¹¹

As such, the HPSR acknowledges that the expanded district's significance as a long-operating airfield was most dependent on internal spatial and visual relationships among the Shenandoah Plaza administrative campus, the large hangars anchoring the airfield, and the various runways and taxiways situated at the center of the airfield. Views towards the airfield's setting to the west, south, and east are far less important in conveying the district's grounds for historical and architectural significance. In addition, according to the 2013 HPSR, much of the areas surrounding the airfield have undergone alterations with new construction, but have left the integral spaces of the airfield intact.

The proposed USGS communications facility would be located to the west of the airfield, outside of the Expanded NAS Sunnyvale Historic District. While it would be visible from within the historic district, the nature of the proposed tower as a narrow, open-framed structure and the low massing of the supporting facilities reduces its potential to cause a significant visual impact. Its placement in relation to existing development to the west of the airfield reduces its potential to obscure the significant view of the San Francisco Bay from the airfield itself. As such, the visual aspects of the Undertaking will have a minor effect on the setting of components of the Expanded NAS Sunnyvale Historic District, but not to the extent that would diminish their historic integrity.

With respect to the historic properties located outside of the Expanded NAS Sunnyvale Historic District, the Mach 50 Helium Tunnel (Arc Jet Laboratory)(N238), and the Structural Dynamics Laboratory (Systems Development Facility) (N242), the description of these buildings' setting is identified in the 2015 documentation of their eligibility as "surrounded by other highly specialized research facilities of varying design."¹² The proposed Undertaking is a specialized research facility of compatible materials and scale with the existing built environment, and would therefore be consistent with this character. As they are similarly located within surroundings including research facilities and an active airfield, the proposed Undertaking would not alter the visual character of the settings of age-eligible buildings N123, N127, N244, and N245 to a degree that would affect their potential significance and integrity.

Atmospheric Effects:

Under the conditions described for the Undertaking, an increase in atmospheric effects would be related only to its installation. This would be temporary in nature and not have any long-term effects on the integrity of setting of any historic properties. As such, the Undertaking would not result in any adverse atmospheric effects that would affect the historic integrity of any historic properties.

Audible Effects:

Under the conditions described for the Undertaking, the primary audible elements to be introduced would occur during the installation of the communications facility. As well, the communications facility would be equipped with a generator that would be utilized if the site's external power supply is interrupted. The proposed generator would be sound attenuated, and would be located inside of a shelter. The predicted sound level during its occasional, infrequent operation would be approximately 68 decibels. These audible aspects would be temporary in nature, and would occur within an area where temporary machine-generated noise related to airfield and scientific facility operation is typical. A such, audible elements of the proposed Undertaking would have no lasting effect on the integrity of any of the identified historic properties.

¹¹ AECOM, *Historic Property Survey Report*, page 5-3.

¹² NASA, Arc Jet Complex Steam Vacuum System Boiler Replacement Project, Attachment E.

Summary of Finding of Effect Analysis

The analysis provided in this section demonstrates that the proposed Undertaking would have no adverse effect. Although historic properties were identified in the APE, no direct physical alterations to these properties are proposed. The Undertaking would not result in any change to the character of a historic property's use or of physical features within a historic property's setting that contribute to its historic significance. It would not introduce visual, atmospheric, or audible elements that would diminish the integrity of a historic property's significant historic features. For these reasons, Page & Turnbull concludes that the Undertaking would result in no adverse effects on historic properties, and recommends a finding of No Adverse Effect.

VI. CONCLUSION

AECOM's 2017 study and the 2019 records search and pedestrian survey conducted by Page & Turnbull identified no archaeological properties within the APE. Due to the low archaeological sensitivity of the ADI and limited extent of proposed ground disturbance associated with the Undertaking, there is low potential for Undertaking activities to inadvertently encounter previously unrecorded archaeological deposits.

Three previously-recorded above-ground historic properties and four age-eligible, previously unevaluated properties are located within the APE. The Undertaking, which would involve the construction of a communications facility with a tower, support building, and associated facilities, would not have the potential to alter, directly or indirectly, any of the characteristics that qualify a historic property for inclusion in the National Register. After consideration of the criteria of adverse effect, pursuant to 36 CFR Part 800.5(b), this analysis concludes that the Undertaking will result in no adverse effects on historic properties. Page & Turnbull therefore recommends a finding of No Adverse Effect.

VII. PREPARERS' QUALIFICATIONS

Page & Turnbull is an architectural design, planning, and historic preservation with staff preservation architects, designers, architectural historians, planners, and conservators with academic training and years of experience in historic preservation and related fields. All of our professional staff meet or exceed the Secretary of the Interior's Professional Qualifications Standards for History, Architectural History, Historic Architecture, or Historic Preservation. The archaeological survey, records search request, and report preparation were conducted by Stacy Kozakavich, Ph.D., who is a Registered Professional Archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for Archaeology, History, and Architectural History.

APPENDIX A: UNDERTAKING MAPS

- A-1 Undertaking Location
- A-2 Undertaking Vicinity
- A-3 Area of Direct Impacts (ADI), Area of Potential Effects (APE), and Identified Historic Properties.

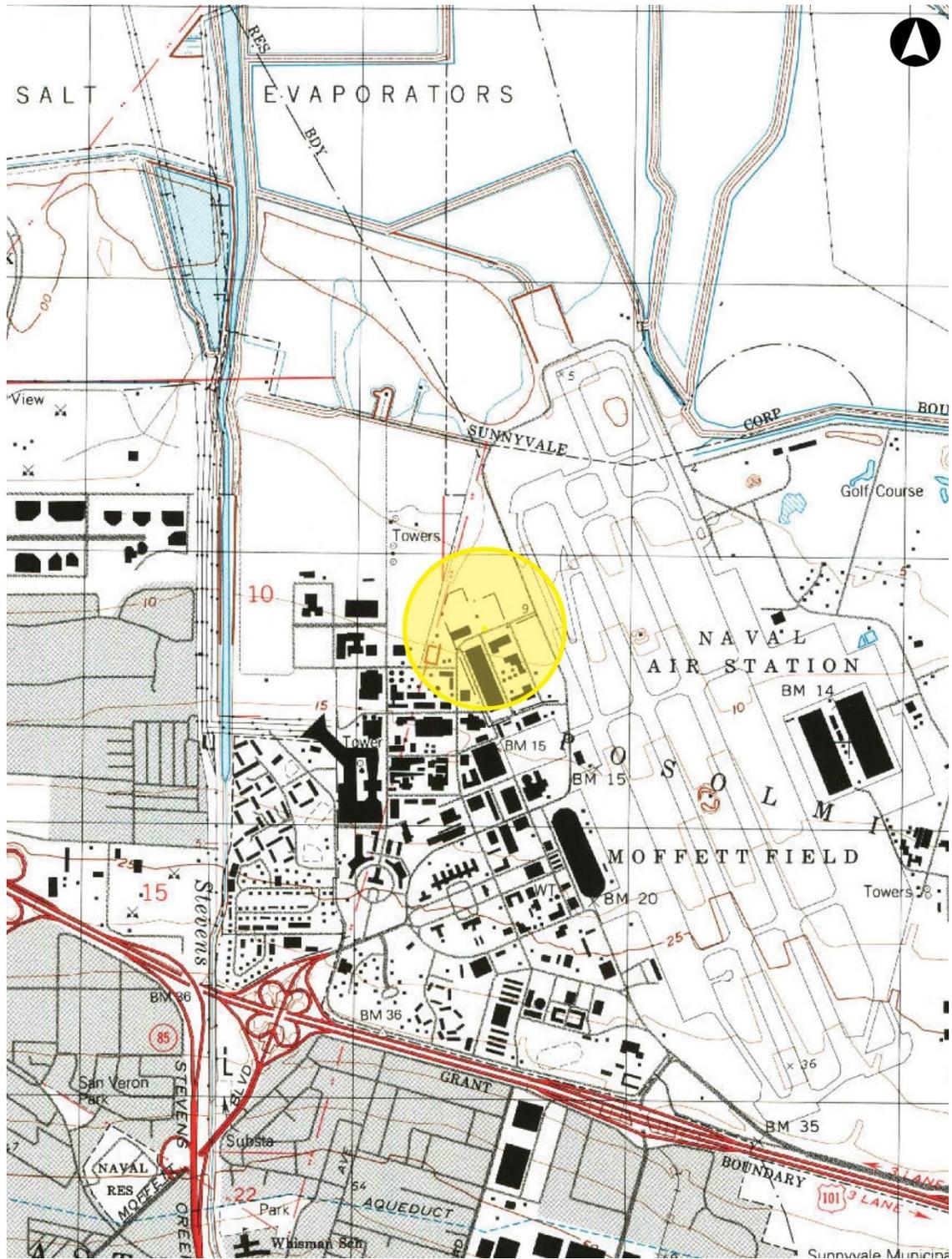


Figure A-1: Undertaking Location. Yellow circle indicates APE. Source: USGS Topographic Quadrangle, Mountain View, CA, 1997. Scale 1:24,000.



Figure A-2. Undertaking vicinity. Yellow circle indicates APE. Expanded NAS Sunnyvale Historic District shaded red. Wind Tunnel Historic District shaded blue. Background image source: Google Earth, 2018, edited by Page & Turnbull.



Figure A-3. Area of Potential Effects. Background image source: Google Earth, 2019, edited by Page & Turnbull.

APPENDIX B: PROPOSED PROJECT

September 8, 2019 Undertaking drawings prepared by GDS, Inc.

The following content was redacted from this public posting:

Appendix B: Proposed Project
September 8, 2019 Undertaking drawings prepared by GDS, Inc.

APPENDIX C: EXISTING CONDITIONS | PHOTOGRAPHS



Figure C- 1. South and east facades of Building N242, view northwest. Building N144 at right. Building N127 in background.



Figure C- 2. View northeast from Pollack Road, ADI enclosed by fence at left.



Figure C- 3. Southern extent of ADI, view northwest from Pollack Road.



Figure C- 4. View northwest across ADI.



Figure C- 5. View toward Building 127C from ADI, looking northeast.



Figure C- 6. View southwest across ADI.



Figure C- 7. Exposed ground surface in ditch at south side of ADI, view northeast.



Figure C- 8. Exposed ground surface in undeveloped area to northeast of ADI, view southwest.



Figure C- 9. Southeast facade of Building N127, view northeast.



Figure C- 10. Southeast and northeast facades of Building N244, view northwest.



Figure C- 11. Building N245, northwest and northeast facades. View southwest.



Figure C- 12. Northwest and northeast facades of Building N144, view southwest.

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